Attachment 1

Unmaintained Road Corridors – Request for Service

Road Name	2006 Road Register	2019 Road Asset Register	IntraMaps (Council's Official Mapping)	Council Resolutions since 2019	Unformed Roads Maintenance Requested	Comments
Mount Bangalore Road	0km	3.2km	3.2km	N/A	3.8km	Council has applied for disaster funding for the unmaintained section as it meets the criteria.
Hotchkiss Road	0.2km Sealed 5.3km Unsealed Surface 5.5km natural formation	2.8km	2.8km	N/A	2.8km	There is a small area 370m^2 where the track goes that is private land.
Unnamed Road Corridor off Timor Road	0km	0km	0km	0km	0.3km	Property access only across road corridor
Track off Black Stump Way between Coolah and the Golden Highway	0km	0km	0km	0km	0km	Property access only.

Road Name	2006 Road Register	2019 Road Asset Register	IntraMaps (Council's Official Mapping)	Council Resolutions since 2019	Unformed Roads Maintenance Requested	Comments
Bong Bong Road	5.6km Natural formation	3.2km	3.2km	N/A	1.8km	
Unnamed Road corridor of Wangmans Road		0km	0km	N/A	1.65km	Service 2 properties and access to the State Forest.
Maroo Road	2.4km		2.4km	N/A	3.9km	There is an open DA on this road which will increase the road length once the DA conditions are met.
Yaminbah Road	12.8km Unsealed Surface 8.4km Natural Formation 8.6km Unformed (not maintained)	13km	12.9km	N/A	4.6km	Maintained section finishes before the causeway
Tonniges Road	2.4km	4km	2.4km	2.4km	1.6km	

Road Name	2006 Road Register	2019 Road Asset Register	IntraMaps (Council's Official Mapping)	Council Resolutions since 2019	Unformed Roads Maintenance Requested	Comments
Stannix Park Road	10.5km Natural formation	0km	0km	0km	0km	Private Roads. All residents have been notified.
Unnamed road corridor off Brooks Road	0km	0km	0km	n/a	0.3km	Property access only across a causeway. Part of the corridor is Crown.
Cainbil Road	4.5km Unsealed Surface 7.4km Natural Formation	4.5km	4.5km	n/a	8km	Joining Cainbil Road to the Golden Highway.
Spir Road	0km	0km	0km	n/a	.81km	Starts in Mid-Western Shire off Tucklan Road.

Access Across Road Reserves to Properties

Type: Strategic

1. Purpose

To clearly define responsibilities for physical access to properties from the Council roadway.

2. Objectives

The issues of financial contribution, specifications, and approvals regarding property access are clearly defined.

3. Scope

This policy applies where property owners require vehicle access between property boundary and vehicle carriageway. This policy applies to driveway access and pedestrian access in urban areas. This policy also applies to property access in the rural area between vehicle carriageway and property boundary.

This policy also applies to situations where Council has altered levels and/or drainage conditions on the carriageway which have affected property access levels.

4. Background

Council is a roads authority and has responsibility for management of activities and condition of road reserves. The area of land between property adjoining the road reserve and the formed or constructed carriageway may be used as a driveway entrance or exit to the property. The property owner and Council have different roles in relation to management of driveway entrances.

5. Legislation and Associated Documents

5.1.

ASSOCIATED POLICIES	• Contributions for Kerb & Guttering and Paving
ASSOCIATED LEGISLATION	• *Roads Act 1993*
ASSOCIATED DOCUMENTS	Nil

6. Definitions

Term	Definition
Road Reserve	area of land designated as road and controlled by Council
Property Access	sometimes referred to as driveway, driveway entrance, driveway exit. The area of land used by vehicles to cross between carriageway and property boundary
Vehicle Carriageway	the section of road reserve used for vehicle travel. Where kerb and guttering exists, it is generally the area of road between kerb faces
Approved Property Access	are access crossings either constructed by Council or constructed by the property owner in accordance with specifications and formal approval by Council
Unauthorised Access	1) Constructed with prior permission and/or not in accordance with Council specifications or; 2) Creating an obstruction to a road or stormwater drain.

7. Policy Statement

The property owner is responsible for all costs associated with installation and maintenance of property access between vehicle carriageway and property boundary. Council is not responsible for any costs associated with upgrading or maintenance of property access.

Any upgrade, repair or maintenance works associated with the property access must first be approved by Council. Council may direct a property owner to undertake repairs to a property access where it can be shown that the access presents a public safety hazard or presents a hazard to the integrity of the road.

Roadworks undertaken by Council that change the condition or level of a property access will be remedied by Council.

The obstruction of drains or gutters with any objects or structures used by the property owner to obtain vehicle access will be considered unauthorised. Unauthorised accesses will be removed by Council staff after the property owner is given twenty-eight (28) days' notice in writing.

The installation of a second property access by the property owner will not be permitted unless specifically authorised by Council.

8. Responsibilities

The following officers in Council have responsibility for implementation of this policy: Manager Projects and Director Technical Services.

9. Getting Help

The following officers in Council are able to provide advice on this policy: Manager Road Operations; Manager Urban Services and Facilities; Manager Projects and; Director Technical Services.

Version Control

DEPARTMENT	**Technical Services**		
RESPONSIBILITY	Director Technical Services		
VERSION CONTROL			
Policy Name	**Id No and Version**	**Resolution**	**Date Adopted**
Access to Properties	1	116	22 October 2009
Access Across Road Reserves to Properties	2	122/1314	19 September 2013
Access Across Road Reserves to Properties	3	30/1718	20 July 2017
Access Across Road Reserves to Properties	4	335/2021	20 May 2021
Next Review Date		2023	

Upgrading of Roads Not Constructed or Maintained by Council

Strategic

1. Purpose

This policy aims to set out the circumstances and procedures under which property owners are able to undertake roadworks on Council public roads within the Warrumbungle Shire Local Government Area.

2. Objectives of the Policy

The expected outcomes of this policy are as follows:

- To allow property owners to provide access to their land at reasonable cost.
- To minimise requests for Council to further upgrade or maintain a road provided by a property owner.
- An understanding by property owners of the conditions under which they are able to undertake roadworks when Council is not in a position to fund the works.
- That roadworks are undertaken in accordance with set guidelines and standards to minimise risk of injury or damage to users of the road.
- To ensure that the effects on the environment are considered and adverse impacts minimised.
- To ensure that de-facto land developers are required to provide a standard of road identical to that required by subdivision.

3. Policy Scope

This policy covers those public roads vested in Council, but not constructed or maintained by Council. Within the Warrumbungle Local Government Area, there are many hundreds of kilometres of road vested in Council but not maintained by Council.

4. Background

These roads often provide the only legal access to an owner's property; however, they are not constructed or maintained by Council. In effect, these unformed roads are 'paper roads' or roads that are simply marked on a map. Often these roads traverse difficult terrain, such as flood prone areas and rocky ridges.

The relevant legal framework is contained in the *Roads Act 1993*.

- Council has no statutory duty to carry out works of construction or repair of public roads, or to keep them in repair (section 71).
- It is an offence to carry out any work on a public road without the consent of Council (section 138).
- Council can give this consent subject to conditions (section 139).
- Council can revoke this consent at any time and for any reason (section 141).
- If the road is a Crown public road, the Land and Property Management Authority will only permit work on the road if Council accepts the road as public road. Council may impose identical conditions to those that would apply to a public road.

5. Definitions

Crown Roads – public roads vested in the Crown and managed by the Land and Property Management Authority.

Council Public Road – public roads vested and managed by Warrumbungle Shire Council.

Property Owner – owner of land within Warrumbungle Shire Council.

6. Policy Statement

If a property owner intends to gain vehicular access to their land along an unformed road, then the following procedures and conditions will apply:

- A written application to undertake roadworks by the property owner on a Council public road must be lodged clearly stating the reasons for the proposal. In the case of a Crown public road, the application must be accompanied by a letter of approval from the Land and Property Management Authority (Department of Lands).

- The application will be assessed and considered by Council at an Ordinary monthly meeting of Council. If an approval is given, the property owner must undertake the works in accordance with the following standard conditions:

    - In the case of access to a single lot or where vehicle movements are likely to be less than 10 per day on average:

        - Width – 4 metres.
        - Depth of compacted gravel – 100mm.
        - Longitudinal grades greater than 1 in 6 are bitumen sealed.
        - Drainage pipes installed to convey 1 in 10 year storm event.
        - Adequate scour protection and table drains are constructed.

    - In the case of access to multiple lots or where vehicle movements are likely to be between 10 and 50 vehicles per day on average:

        - Width – 6 metres.
        - Depth of compacted gravel – 200 mm.
        - Road grades, horizontal and vertical curves designed for a design speed of 60 kph.
        - Longitudinal grades greater than 1 in 6 are bitumen sealed.
        - Drainage pipes installed to convey 1 in 10 year storm event.
        - Adequate scour protection and table drains are constructed.
        - Preparation of road construction plans.

- The upgrading of a road to Council standards does not automatically imply that Council will maintain that road. A formal resolution from Council is required before Council assumes responsibility for maintenance of the road.

7. Responsibilities

The following officers in Council have responsibility for implementation of this policy: Manager Road Operations; Manager Asset & Design, and; Director Technical Services.

8. Associated Documents

- *Roads Act 1993*.

9. Getting Help

Manager Road Operations.

10. Version Control

This policy shall be reviewed every four years by the Director Technical Services. The next review is Due July 2021.

Policy Name	Version	Resolution	Date
Upgrading of Roads Not Constructed or Maintained by Council	1	143	21 October 2010
Upgrading of Roads Not Constructed or Maintained by Council	2	127/1314	19 September 2013
Upgrading of Roads Not Constructed or Maintained by Council	3	30/1718	20 July 2017

Attachment 1

Warrumbungle Shire Council
Submission to the Joint Standing Committee on Road Safety (Staysafe)

Warrumbungle Shire Council appreciates the granting of an extension of time in order to make a submission to this Inquiry.

Our submission addresses each of the terms of reference in turn.

The impact of speed limits and travel times on driver behaviour and safety
Regional areas of Australia account for 55% of road crash deaths.

The rate of road crashes is 9.6 per 100,000 people in regional Australia compared with 2.2 per 100,000 in major cities.[1]

For the period 2016-2020, in the Warrumbungle LGA, speeding is listed as the cause of casualties in 34% of crashes compared to 28% in Western NSW and 17% in all of NSW.[2]

In terms of degrees of crashes, 37% of crashes are fatal or serious injury compared to 27% in Western NSW and 22% in all of NSW. [3]

A number of roads in regional areas, with Warrumbungle being no different, are undivided, single carriageways with poorer surface conditions and design and increased hazards such as straying animals and roadside obstructions such as vegetation which are a legacy of lower road standards.

The default speed limit for these roads typically applies (100km/h).

73% of fatalities in regional areas were the result of run-off road and head-on crashes.[4]

Other contributory issues in regional areas include:
- Fatigue, often as a result of longer journey times
- Limited access to public transport
- Drivers not driving to conditions.

There are some road treatments that can be employed to reduce these risks such as:
- Audio tactile line markings
- Wire rope and other barriers
- Median treatments including widening centrelines or safety barriers
- Shoulder widening
- Improved protection of hazards on curves.

Obtaining funding for some of these treatments is not always easy. One of the issues is that evidence of crash history is often difficult to demonstrate because a number of non-injury accidents are not reported.

Not all councils in NSW have access to a Road Safety Officer who can drive some of these safety initiatives because it requires 50/50 funding.

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[1] Factsheet: Regional road safety | National Road Safety Strategy
[2] Crash and casualty statistics - LGA view - Interactive crash statistics - Statistics - NSW Centre for Road Safety
[3] Crash and casualty statistics - LGA view - Interactive crash statistics - Statistics - NSW Centre for Road Safety
[4] Factsheet: Regional road safety | National Road Safety Strategy

Attachment 1

RECOMMENDATIONS

1. *That the Local Government Road Safety Program be expanded to ensure that every council has access to a Road Safety Officer to better resource their road safety planning and development of network safety plans.*

2. *That the Inquiry consider simplified processes for regional councils to access safety improvement funding.*

The impact of improved vehicle technology and road infrastructure

Recent years have seen a significant improvement in vehicle technology from anti-lock braking and electronic stability control to adaptive cruise control, automatic emergency braking, blind spot alerts, lane departure warning, reversing cameras, driver and passenger airbags, self-tensioning seat belts and so on.

Road infrastructure improvements include improved crash barrier systems, signage (including improved real time information about road conditions such as delays, weather conditions etc.), road markings, street lighting and improved frangibility of roadside poles and other structures.

According to data from the National Road Safety Strategy, road user deaths have dropped by more than 20 per cent over the past decade, as both passive and active safety technologies have improved.

In the near future autonomous vehicles and intelligent transport systems have the potential to significantly improve road safety. A national approach is required to ensure consistency across Australia.

It is likely that priority will be given to metropolitan areas where potentially greater benefits can be realised however there is the opportunity to make significant improvements to road safety in rural and remote areas with longer travel distances, fatigue issues and limited public transport.

NSW Government has established a facility in Orange with the capability to test new and emerging technologies.[5] It is hoped that there may be opportunities to expand this testing with pilots or trials on regional roads.

RECOMMENDATION

3. *That the Inquiry advocate for Regional NSW to be included in the roll out of new technologies and infrastructure improvements such as autonomous vehicle testing*.

The use of variable speed limits

Currently variable speed limits are used in a limited number of situations such as on motorways and bridges.

They are used to *"achieve and maintain optimal network traffic conditions, with minimal delays and congestion to provide an appropriate balance between safety, mobility and amenity on public roads."* [6]

Variable speed limits are also used at school zones where speed limits are reduced at school times to reduce the risk to pedestrians especially children.

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[5] Cudal facility open for testing - Research - NSW Centre for Road Safety

[6] Variable speed limit signs

It can be argued that the use of variable speed zones could be expanded where particular conditions could permit the prevailing speed limit to be changed.

While motorists are always required to drive to the conditions, there are situations where an explicit speed change may be required.

For example, in parts of rural Victoria, when vehicles approach a highway from a side road, they trigger sensors which reduce the speed on the highway from 100km/h to 70km/h.[7]

There may also be situations where say a 70km/h speed limit through a rural village could be changed to 100km/h between the hours of say 11pm and 5am when the roadside activity that warranted the 70km/h speed limit no longer applies.

With smart sensors and connected infrastructure there is scope for greater use of variable speed limits in appropriate circumstances.

RECOMMENDATION

4. *That the Inquiry recommend that TfNSW explore the expanded use of variable speed limits especially in rural/regional areas.*

Any other related matters

Heavy vehicle safety

The Oxley and Newell Highways traverse the Warrumbungle Shire and serve as key inland freight routes from Melbourne to Brisbane. In addition, there are a number of strategic regional routes providing access for the transport of sheep, cattle and grain products.

Consequently, the percentage of heavy vehicles on the road network is high relative to other areas.

Approximately 18% of all road crash deaths involve a heavy vehicle.[8] While heavy vehicle crashes are less prevalent than other vehicles, their greater mass contributes to more severe crashes with the other vehicle suffering the worst of the impact.

There are a number of actions that can be taken to improve the safety of roads with a high percentage of heavy vehicles such as the provision of overtaking lanes at regular intervals and the provision of adequate heavy vehicle rest stops to address fatigue.

Council appreciates the recent improvements in passing lanes on the Newell Highway however there is still more work required.

Communications and Connectivity

Being able to call for help in the event of an accident can sometimes mean the difference between life and death. Low traffic volumes in regional areas (which means fewer opportunities to seek help from a passing motorist), combined with poor connectivity, mobile phone black spots and distance from emergency services can translate into a serious situation in the event of a serious injury crash.

While the Commonwealth Mobile Black Spot Program has made some inroads into addressing this issue, there is a lot more work to be done and it is important that this program continues to be funded.

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[7] Side road activated speed signs (arrb.com.au)

[8] National Road Safety Strategy 2021-30

There are a number of outstanding black spot locations in the Warrumbungle Shire area that need to be addressed.[9]

RECOMMENDATIONS

5. *That the Inquiry recommend that TfNSW continue their program of construction of passing lanes on key freight routes.*

6. *That the Inquiry recognise the importance of communications and connectivity and the need to be able to call emergency services in the event of an accident.*

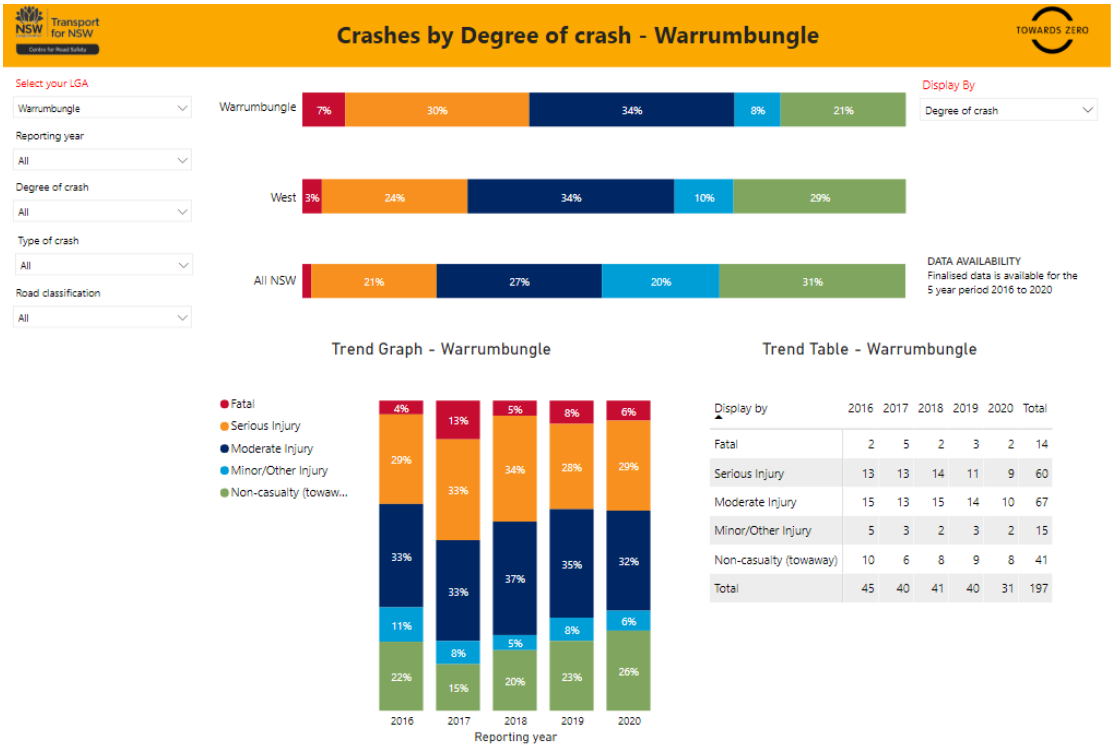
7. *That the Inquiry advocate for the ongoing funding and rollout of the Mobile Blackspot Program.*

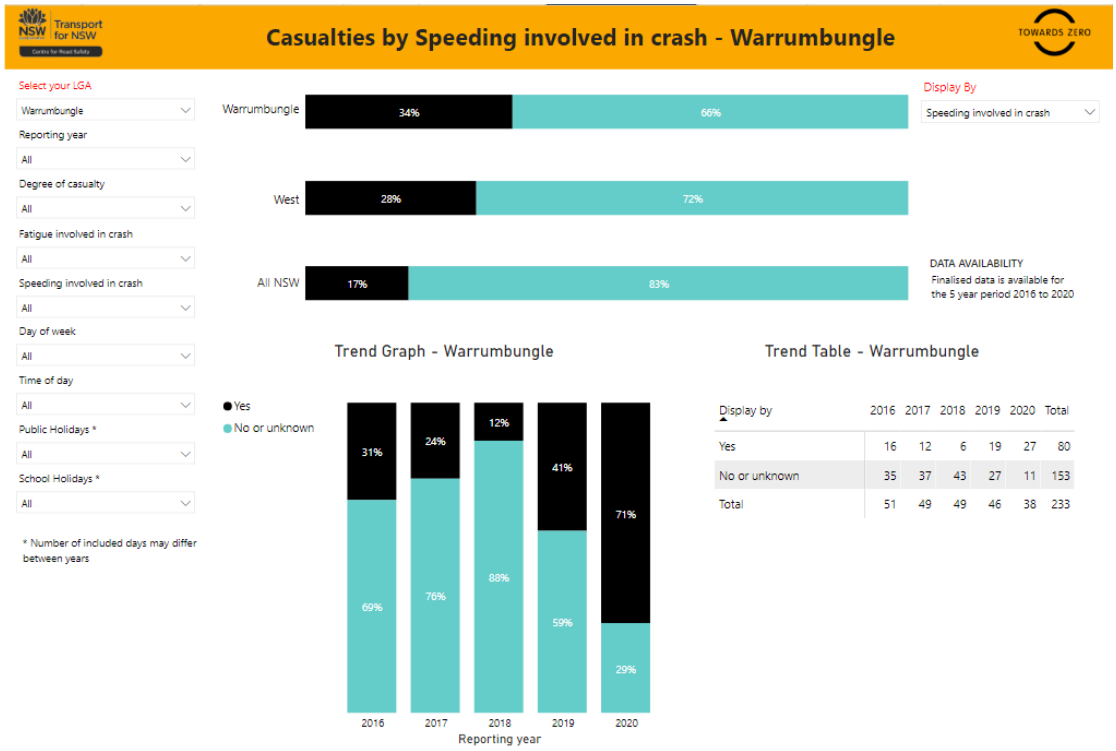
Warrumbungle Shire thanks the Inquiry for the invitation to make a submission.

Resolved by Council on 21 July 2022.

[9] Mobile Black Spot Database

Attachment 1





Attachment 1

Reserve 17798 for Police Purposes – Coonabarabran

[4038] Department of Lands,
Sydney, 27th May, 1893.

RESERVES FROM SALE FOR ACCESS.

HIS Excellency the Lieutenant-Governor, with the advice of the Executive Council, directs it to be notified that, in pursuance of the provisions of the 101st section of the Crown Lands Act of 1884, the land specified in the Schedule appended hereto shall be reserved from sale for access, and is hereby reserved accordingly.

HENRY COPELAND.

CENTRAL DIVISION.

LAND DISTRICT OF COROWA.

No. 17,776. County of Denison, parish of Tocumwal, village of Tocumwal, containing an area of 1 rood 11 perches. The Crown Lands within the following boundaries: Commencing at the north-east corner of portion 71 of 1 acre; and bounded thence on the south by the north boundaries of portions 71 and 50 west to the north-west corner of the last-named portion; thence on the west by a line north to the south side of Browne-street; thence on the north by part of that side of Browne-street east to a point due north of the north-east corner of portion 71 aforesaid; and thence on the east by a line south, to the point of commencement,—shown on plan catalogued T. 10-1,816 Roll.
[Ms. 93-1,889 Dep.]

No. 17,777. County of Denison, parish of Tocumwal, village of Tocumwal, containing an area of 1 acre. The Crown Lands within the boundaries of allotments 6 and 7 of section 37,—as shown on plan catalogued T. 10-1,816 Roll.
[Ms. 93-1,889 Dep.]

No. 17,778. County of Denison, parish of Tocumwal, village of Tocumwal, containing an area of 1¼ acres. The Crown Lands within the following boundaries: Commencing at the intersection of the south side of Hillson-street with the east side of Cowley-street; and bounded thence on the north by part of the south side of Hillson-street bearing east to the intersection of a direct line from the south-east corner of section 33 to the south-east corner of section 37; thence on the south-east by part of that line south-westerly to its intersection with the east side of Cowley-street aforesaid; and thence by that side of that street northerly, to the starting point,—shown on plan catalogued T. 10-1,816 Roll.

In lieu of reserve 14,867 for public recreation, revoked this day.
[Ms. 93-1,889 Dep.]

[4047] Department of Lands,
Sydney, 27th May, 1893.

RESERVES FROM SALE OTHER THAN AUCTION SALE ONLY.

HIS Excellency the Lieutenant-Governor, with the advice of the Executive Council, directs it to be notified that in pursuance of the provisions of the 39th section of the Crown Lands Act of 1889, the land specified in the Schedule appended hereto shall be and is hereby temporarily reserved and exempt from sale other than auction sale only.

HENRY COPELAND.

EASTERN DIVISION.

LAND DISTRICT OF ALBURY.

No. 17,792. County of Goulburn, parish of Carabobala, containing an area of 138 acres. The Crown Lands within the boundaries of measured portions 243 of 79 acres, and 244 of 59 acres,—as shown on plan catalogued G. 3,093-1,475 Roll.

Includes part of water reserve 595, cancelled this day.
[Ms. 93-1,166 Ind.]

LAND DISTRICT OF GLEN INNES.

Within Ranger's Valley Holding, resumed area No. 198A.

No 17,793. County of Gough, parish of Ranger's Valley, containing an area of 151 acres. The Crown Lands within the boundaries of measured portion 106 of 151 acres,—as shown on plan catalogued G. 4,784-1,761.

Includes part of reserve 11,762, cancelled this day.
[Ms. 93-1,854 Ind.]

LAND DISTRICT OF SCONE.

No. 17,787. County of Brisbane, parish of Cherson, containing an area of 80 acres. The Crown Lands within the boundaries of measured portion 49,—as shown on plan catalogued B. 549-2,096 Roll.

In lieu of water reserve 60, revoked this day.
[Ms. 93-2,930 Dep.]

No. 17,788. County of Brisbane, parish of Cherson, containing an area of 67 acres. The Crown Lands within the boundaries of measured portion 101,—as shown on plan catalogued B. 2,137-2,096 Roll.

In lieu of camping reserve 211, revoked this day.
[Ms. 93-2,930 Dep.]

No. 17,789. County of Brisbane, parish of Cherson, containing an area of 49 acres 3 roods. The Crown Lands within the boundaries of measured portion 67,—as shown on plan catalogued B. 2,137-2,096 Roll.

In lieu of camping reserve 213, revoked this day.
[Ms. 93-2,930 Dep.]

CENTRAL DIVISION.

LAND DISTRICT OF COONAMBLE.

Within the resumed area of Wingadee Holding No. 174, notified 11th July, 1885.

No. 17,786. County of Leichhardt, parish of Wingadee, containing an area of 565 acres. The Crown Lands within the boundaries of measured portion 1 of 565 acres,—as shown on plan catalogued L. 2,227-1,902.
[Ms. 93-1,595 Ind.]

[4060] Department of Lands,
Sydney, 27th May, 1893.

RESERVE FROM SALE FOR RACECOURSE.

HIS Excellency the Lieutenant-Governor, with the advice of the Executive Council, directs it to be notified that, in pursuance of the provisions of the 101st section of the Crown Lands Act of 1884, the land specified in the Schedule appended hereto shall be reserved from sale for racecourse, and is hereby reserved accordingly.

HENRY COPELAND.

CENTRAL DIVISION.

LAND DISTRICT OF PARKES.

Within the resumed area of Barrawang Holding No. 498, notified 11th July, 1885.

No. 17,583. County of Cunningham, parish of Trundle, containing an area of 80 acres. The Crown Lands within the following boundaries: Commencing at a point bearing west and distant 8 chains from the north-west corner of suburban portion 75, village of Trundle; and bounded thence by a line bearing south 34 chains 79 links; thence by a line bearing west 23 chains; thence by a line bearing north 34 chains 79 links; and thence by a line bearing east 23 chains, to the point of commencement.

Includes those parts of reserves 6,644 and 6,646 revoked 22nd April.

The above is in lieu of notification of 22nd April, which is hereby cancelled.
[Ms. 93-435 Dep.]

[4040] Department of Lands,
Sydney, 27th May, 1893.

RESERVE FROM SALE FOR POLICE PURPOSES.

HIS Excellency the Lieutenant-Governor, with the advice of the Executive Council, directs it to be notified that, in pursuance of the provisions of the 101st section of the Crown Lands Act of 1884, the land specified in the Schedule appended hereto shall be reserved from sale for police purposes, and is hereby reserved accordingly.

HENRY COPELAND.

CENTRAL DIVISION.

LAND DISTRICT OF COONABARRABRAN.

No. 17,798. County of Gowen, parish of Coonabarrabran, town of Coonabarrabran, containing an area of about 2 acres. The Crown Lands within the following boundaries: Commencing at the intersection of the right bank of the Castlereagh River with the north-eastern side of Robertson-street; and bounded thence by that street south-easterly to the north-western side of a lane; thence by that lane north-easterly 7 chains to the southernmost corner of reserve 14,134 for police purposes, notified 25th July, 1891; thence by the south-western and north-western boundaries of that reserve north-westerly and north-easterly to the south-western side of John-street; thence by that street north-westerly to the Castlereagh River; and thence by that river upwards, to the point of commencement, being part of section 1.

In lieu of reserve 14,139 for public recreation, revoked this day.
[Ms. 93-2,820 Dep.]

Warrumbungle Shire Council Improvement Plan

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
1	All		Documentation / Protocol	Gain formal endorsement and support of the policy from senior executive, including ensuring that organisation activities support effective water quality management such as providing appropriate staffing, financial and training resources and reporting performance to the board or chief executive.	1.1	Drinking Water Quality Policy			Mar-2015	High	Manager Warrumbungle Water	30-Jul-19			Complete	Submitted report to DTS for discussion at MANEX on 1/04/2016, again on 18/05/2016 and again on 22/08/16.	Report to Council - need updating - to adopt DWMS; living document (constantly being updated); going to be in Public Health Act Oct 2018 (Ingo sent email to GMs)		Policy has been developed and was endorsed March 2019		
2	All		Training	Develop and implement a staff awareness program for the DWMS and make the DWMS visible to all employees.	1.1	Drinking Water Quality Policy			Mar-2015	High	Manager Warrumbungle Water; Technical Officer	01-Mar-15			Complete	Hardcopies distributed to DTS; Manager WW – Operational; Manager WW – Special Projects; Technical Officer; Supervisors South (Coolah/Dunedoo), Treatment Plants North (Coonabarabran, Bugaldie, Kenebri), Mains North (Coonabarabran), Baradine, Binnaway, Mendooran . For future review versions: Manager WW – Special Projects to inform Technical Officer who is to distribute copies and keep record of this(under comments section in the spread sheets).					
3	Mendooran		Documentation / Protocol	That WSC prepare and formally adopts a "Drinking Water Quality Policy" and this policy is then "highly visible, continually communicated, understood and implemented by employees and contractors of the organisation".	1.1	Drinking Water Quality Policy	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water; Project Officer	27-Jun-19			Complete		A Drinking Water Quality Policy is in preparation		Policy has been developed and was endorsed March 2019		
4	All		Documentation / Protocol	Develop, document and implement a process for reviewing formal requirements every 12 months or where there are any changes to Council's activities or formal requirements.	1.2	Regulatory and Formal Requirements			Sep-2015	Medium	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				13/12/19: Consultant has provided proposal to review and update DWMS 28/2/20: Closed as included as part of action 334	To be included as part of DWMS review and update (action 334)	
5	All		Training	Develop and implement a staff awareness program for relevant water quality obligations relating to their areas of responsibility.	1.2	Regulatory and Formal Requirements			Sep-2015	Medium	Manager Warrumbungle Water; Technical Officer	30-Jul-21	20-Dec-21	implement WQ meetings	In progress				Quarterly review meeting to cover water quality obligations, alternate staff attendance at meetings. 28/2/20: To consider schedule of to re-implement water quality meetings 30/7/21: monthly all WW staff meetings held with relevant items brought up on agenda; fortnightly water quality summary circualted to relevant staff; DWMS being updated; WQ still to be re-implemented	Re-implement quarterly meetings (after finalisation of improvement plan). Process to be formalised in updated DWMS (Action 334)	
6	All		Training	Formally document and communicate roles and responsibilities of staff relating to management of drinking water quality.	1.2	Regulatory and Formal Requirements			Sep-2015	Medium	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				13/12/19: Consultant has provided proposal to review and update DWMS 28/2/20: Closed as included as part of action 334	How this is documented to be reviewed in updated DWMS (Action 334)	
7	All		Documentation / Protocol	Develop a regular review process to update the list of stakeholders. Ensure contact details are current and all relevant parties are involved in engagement processes.	1.3	Engaging Stakeholders			Sep-2016	Low	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				13/12/19: Consultant has provided proposal to review and update DWMS 28/2/20: Closed as included as part of action 334	To be reviewed as part of DWMS review and update (action 334)	
8	All		Documentation / Protocol	Update stakeholder/relevant agencies list to comprehensively identify all stakeholders who could affect, or be affected by, decisions or activities of the drinking water supplier. Where possible, this list should also identify the accountabilities and responsibilities of relevant agencies in support of the water supplier. This list will be included in this DWMS (in the main body) and maintained as a separate document referenced in Appendix D. It is also recommended that the contact register be inserted on a separate page so that it may be easily printed and posted on workplace walls.	1.3	Engaging Stakeholders			Mar-2015	High	Supervisor Treatment	30-Jul-21	30-Sep-21	complete key suppliers	In progress	A draft ERP was developed by Bligh Tanner in collaboration with Council. Contact registers were developed for each scheme that now need to be completed (need input from operational staff).			Registers have been updated, further review still needed. Finalisation of ERP to be included as part of NSW Health project. ERP responsibility to be allocated, including setting review times 13/12/19: Confirmed that development of ERP is to be undertaken as part of Hunter H20 NSW Health project. 20/2/20 - Lists to be included in DWMS when updated 24/7/20: IRPs workshop held on 2/7; Bligh Tanner work to be provided to HH2O 24/3/21: CW to ask CN to add to her task list including finalisation (info from supervisor) + annual or six-monthly review/update 30/7/21: Supervisor Treatment to complete key supplier lists	Following finalisation of ERP, stakeholder lists to be included in DWMS	
9	All		Documentation / Protocol	Develop appropriate mechanisms for stakeholder commitment and involvement. Document the planned approach including partnership agreements or Memorandum of Understanding (MoU).	1.3	Engaging Stakeholders			Sep-2015	Medium	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				13/12/19: Consultant has provided proposal to review and update DWMS 28/2/20: Closed as included as part of action 334	To be included as part of DWMS review and update (action 334)	
10	All		Documentation / Protocol	The water supply system analysis, including the flow charts and catchment characteristics, will be reviewed internally in 12 months, and upon any significant changes to any of the water supply systems. The review process and records of the outcomes of these reviews should be documented.	2.1	Water Supply System Analysis			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Implemented				Flow chart reviewed as part of quarterly meeting. Flow charts updates in progress		
11	All		Operations	Enter all water quality monitoring data into electronic spreadsheets on a weekly basis. Allows for ease of data processing.	2.1	Water Supply System Analysis			Mar-2015	High	Technical Officer	30-Jul-19			Implemented	This being done by Council's Technical Officer.			All information is being entered electronically		
12	Mendooran	Reservoirs	Investigations	That WSC investigates options to reduce water age in the Coolabah rural residential estate water supply zone. This could include isolation of individual reservoirs i.e. Reservoirs No. 1, No. 2 and/or No. 3, on a seasonal basis to only store water volumes sufficient to meet peak day demands.	2.1	Water Supply System Analysis	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Supervisor South	22-Jan-19			Implemented		Included in S&S funding (R1)				
13	Binnaway	Backwashing	Operations	Perform regular testing of the following: · Filtered water turbidity immediately after a backwash · Wash water turbidity during a backwash · Filter headloss immediately after a backwash --> 24/11/20: no DP measurement device currently installed	2.1	Water Supply System Analysis	Hunter H2O Audit 2014	BWY009	2014	Medium	Supervisor Treatment	24-Nov-20	30/06/2021		Closed	Currently, water quality testing only occurs two hours after the backwash has completed. No testing is carried out on the filtered water after a backwash or wash water during the backwash sequence			Media replaced, reduced priority to medium. Covered by scoping study. Part of water treatment plant upgrades (FY19/20) 28/2/20: Consider online turbidity FY20/21 in advance of automation project 24/11/20: online NTU include under (A328 - Automation)		
14	All	Performance monitoring	Documentation / Protocol	The assessment of the water quality performance data should be reviewed every 12 months, and upon any significant changes to any of the water supply systems. Review will assess any seasonal trends, consistent exceedances or other potential water quality issues. The formal review process and records of the outcomes of these reviews should be documented.	2.2	Assessment of Water Quality Data			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Implemented				Quarterly DWMS reviews undertaken Fortnightly review of CCP data (exceedance summaries), sent to Supervisors and Manager and reviewed in operations meeting. Monthly report to General Manager of CCP exceedances		
15	All	Performance monitoring	Monitoring	Develop a central electronic spreadsheet to record results of operational sampling and testing to allow these results to be easily reviewed and analysed.	2.2	Assessment of Water Quality Data			Mar-2015	High	Technical Officer	01-Mar-15			Complete	Operational data is entered by Technical Officer on a weekly basis.					
16	All	Performance monitoring	Monitoring	Council to include new operational data prior to review of the DWMS.	2.2	Assessment of Water Quality Data			Sep-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented				Water quality data reviewed as part of quarterly meeting and annual DWMS review report		
17	Coolah	Disinfection	Operations	Access to the safety shower/eye wash should remain unimpeded at all times. The safety shower eye/wash should be maintained in good working order. Breathing Apparatus should be immediately available on site but external to the chlorine room.	2.3	Hazard ID and Risk Assessment	DPI Inspections	DPI COH001	Jan-2019	High	Supervisor Treatment	24-Apr-20	13-Mar-20		Complete				Breathing apparatus to be included as part of FY19/20 (replace chlorine room). Tender to be developed. Checklist has been developed for safety showers/eyewash. 27/9/19: GR to get prices on eyewash/safety shower outside chlorine room; check with WHS officer re feasibility/recent audit 27/9/19: need info of equipment to be reused (alarming system + scales) + drone pictures (Coolah) 13/12/19: Breathing apparatus still to be made available. Project management resources - proposal has been sought 28/2/20: Eyewash not yet installed and breathing apparatus still to be made available. 24/4/20: Eyewash installed and breathing apparatus available.	Upgrade project also to include. Need info of equipment to be reused (alarming system + scales) + drone pictures (Coolah)	
18	Mendooran	WTP	Minor works	A small leak in the main RPZ installation post service water pumps needs addressing for WHS reasons and because it is inundating an access pit for the backwash flow meter.	2.3	Hazard ID and Risk Assessment	DPI Inspections	DPI MEN006	Jan-2019	High	Supervisor South	27-Aug-19	28-Aug-19	completed as 27-9-19	Complete		The main operator for the plant was unavailable on the day of inspection so a follow up inspection is planned to review the plant operation. It was noted that back flow prevention valves have been installed to prevent the reoccurrence of chemical backflows to the clear water tank. A small leak in the main RPZ installation post service water pumps needs addressing for WHS reasons and because it is inundating an access pit for the backwash flow meter. The day log for water quality data showed the plant was performing well.		Leak has been completed		
19	Mendooran	Service Water	Minor works	Repair service water system to supply water at pressure to the chemical dosing boards and safety showers. A backflow prevention valve should be installed post last connection for eyewash/safety showers to prevent this situation reoccurring. Council should satisfy themselves as to whether this should be a testable device. Consider running a service water line across to the laboratory for the purpose of treated water testing.	2.3	Hazard ID and Risk Assessment	DPI Inspections	DPI MEN009	Jan-2019	High	Supervisor South	27-Jun-19			Complete		The service water system at the water plant has not been functioning correctly since construction. The system is currently running off the town water supply which is not at a high enough pressure to efficiently run the eyewash/safety showers.		Service water system has been repaired. Testable backflow prevention valve has been installed (2018). Service water line to no longer considered necessary.		
20	All		Documentation / Protocol	The hazard identification and risk assessment should be internally reviewed 12 months. Every five years (or upon any significant changes to any of the water supply systems) Council should undertake a comprehensive review. The review process and records of the outcomes of these reviews should be documented.	2.3	Hazard Identification & Risk Assessment			Sep-2015	Medium	Manager Warrumbungle Water	28-Feb-20		TBC	Closed				Review of risk assessment to be undertaken as part of NSW Health DWMS project risk assessment review 24/7/20: closed as included in new action A351		
21	Dunedoo	Disinfection	Minor works	Install the chlorine dosing pump on the existing wall mounted bracket	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	DUN004	2014	Medium	Supervisor South	22-Jan-19			Complete		The chlorine dosing pump is currently sitting on a bucket and not firmly attached to an appropriate support bracket		Dosing pump has been mounted on the wall (late 2018)		

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
22	Coolah	Safety	Minor works	Relocate the safety shower/eyewash station to outside of the dosing room. The safety shower must be: · Located within 10 seconds reach of the hazard · Located on the same level as the hazard and free from obstructions The location and installation of the safety shower eyewash must comply with Australian Standard AS4775-2007 Designate an evacuation assembly point for the site. The assembly point is to be sign posted and discussed in contractor/personnel inductions to site. The assembly point is to take into account proximity of chlorine dosing facility. More than one assembly point may be needed (depending on wind direction, one may be more appropriate than the other)	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	CLH009, CLH010	2014	Medium	Supervisor Treatment	24-Nov-20	6/03/2020		Complete		· The chlorine safety shower/eyewash station is currently located inside the chlorine dosing room. In the event of a chlorine leak, the unit would not be able to be used. This does not comply with Australian Standard AS4775-2007. · There is no designated evacuation assembly point for the site in the event of an emergency		Evacuation assembly point to be allocated and sign posted. 13/12/19: Still to confirm if eye wash station has been installed. Signs have been ordered (evacuation and meeting point) and waiting to be delivered. 28/2/20: Eyewash station has not been installed. Signs have not been delivered. 24/11/10: complete (incl. BA installation)	Signs to be installed following delivery Investigate portable eyewash station	
23	Baradine	Disinfection	Minor works	Ensure the dosing room has adequate ventilation and install a chlorine gas leak detector	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	BAR008	2014	High	Supervisor Treatment	24-Jul-20	30/05/2020		Complete	The chlorine dosing room is well laid out, clean and kept in an excellent condition. However, there currently is not a chlorine gas leak detector installed			Alarm has been installed (incl. gas detector). Works still to be completed on chlorine room (FY19/20) 13/12/19: Dependent on outcomes of review of need for plant upgrade/replacement 28/2/20 Quotes to undertake work are being reviewed 24/7/20: completed		
24	BWY	Environmental	Minor works	· Redirect the drain flow from the soda ash/alum dosing room to the external alum bulk storage bund --> **complete** · Take measurements of the bund wall, the tank and determine the angle from the top of the tank to the bund wall and ensure the bund complies with Australian Standard AS3780 --> measurements taken, volume is suff sufficient however angle might not · Ensure the chlorine room ventilation complies with the requirements of Australian Standard AS2927 --> **complete** · Investigate if the forced ventilation fan needs to be larger to provide adequate ventilation --> **complete**	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	BWY012, BWY013, BWY014	2014	High	Supervisor Treatment	30-Jul-21	30-Sep-21	check bunding compliance	In progress	· Any spilled chemical in the soda ash dosing and storage area can potentially drain to the stormwater drainage system · The alum bulk storage bunded area may potentially not comply with Australian Standard AS with regard to appropriate angle from the top of the storage tank to the top of the bund wall · There is limited ventilation in the chlorine dosing room which is a potential safety hazard			Investigation still needed To be included in treatment plant upgrades Chlorine room items covered under action 329 13/12/19: Have received quotes, sizing to be confirmed. HunterH20 audit to be undertaken next week, HunterH20 to confirm requirements 28/2/20- see update action 23 24/7/20: chlorine room items addressed (see also action 23); soda ash/alum bunidng outstanding 24/11/20: soda ash/alum bunding still required 24/3/21: need to put a sump in dosing room, put sump in and redirect to bunding or to future fluoride room when the chemical tank for it gets installed; compliane with AS3780 for bunding still to be confirmed 30/7/21: compliance with AS3780 still to be confirmed (assing to TL Treatment Nth); in case of non-compliance a self-bunded tank would need to purchased, which could be covered under future funded upgrade works		
25	Coonabarabran	Lime dosing	Minor works	Ensure safety covers are installed that adequately cover all moving parts	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	COO010	2014	High	Supervisor North	27-Jun-19	31/12/2019	27/09/2019; were off at time of audit	Complete	Some equipment in the lime dosing room does not have appropriate covers that cover moving parts. This is a hazard for personnel injuring fingers etc.			Include in WTP upgrades FY19/20	To be included as treatment plant upgrades	
26	CLH	Disinfection	Minor works	· Organise for chains to be installed to secure the cylinders in place and reduce the risk of the cylinders falling over · Investigate ventilation requirements as outlined in Australian Standard AS2927. Implement ventilation modification if required to comply with the Australian Standard. This may be achieved through improved forced ventilation or modification to the vents for cross ventilation · Chlorine gas is an oxidising agent and sources of fuel should not be stored in the same room. · Items stored on the ground in the room poses a trip hazard and should be removed or store in a more tidy manner.	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	CLH006, CLH007, CLH008	2014	High	Project Engineer	30-Jul-21	31-Dec-21		In progress	· The chlorine gas cylinders are currently not stored in a secure manner. Gas cylinders should be stored securely on the site to reduce the risk of damage to the cylinder or other equipment dosing lines should a cylinder topple over. · There is currently no forced ventilation in the chlorine dosing room. · Redundant equipment and boxes are contained in the chlorine dosing room			Chains have been installed All other items to be addressed FY19/20 (replace chlorine room). Tender to be developed. 27/9/19 & 13/12/19: need info of equipment to be reused (alarming system + scales) + drone pictures (Coolah) 24/4/20: Cylinders have chains so can be secured 24/7/20: outstanding only is chlroine room upgrade 24/11/20: as above 24/3/21: AM reviewing previously prepared Tech Specs to be able to call RFQs 30/7/21: Project Engineer sent out and receive back RFQs, however insufficient budget - BP report to August 2021 meeting		
27	Mendooran	Reservoir Hypochlorite	Minor works	· Cover and secure the dosing line and dosing point at the reservoir. · Install a chemical bund in the hypochlorite dosing room. Consider constructing a bunded fill point for the delivery vehicle	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	MEN014, MEN015	2014	High	Supervisor South	27-Jun-19			Complete	The sodium hypochlorite dosing line and dosing point is: · Exposed and unsecured. There is the potential for damage for damage, contamination or vandalism · Not currently bunded. Any chemical leaks/spills will be unable to be contained			Dosing line now in a covered pit. Tank is self bunded.		
28	BAR, CBN	Safety	Operations	Organise routine tagging of portable electrical equipment to reduce safety risks	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	BAR014, COO015	2014	High	Supervisor Treatment; Director Environment Services	24-Apr-20	31/03/2020		Implemented	No schedule for electrical equipment tagging is currently in place			Manger sent email WHS representative - waiting for reply. 13/12/19: Baradine tagging has been complete. CBN still to be done 28/2/20: CBN still to be done. All depots have been done. Electrician to be engaged for CBN. 24/4/20: Electrician has been engaged	WHS representative to table at next committee meeting. Organise tagging for CBN Director to raise at senior level for issue across Council.	
29	Bugaldie	Safety	Minor works	· Re-route the dosing line to reduce the risk of chemical contact in the event of a leak in the dosing line. · Remove redundant materials from the site shed and maintain housekeeping	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	BUG007, BUG09	2014	High	Supervisor North	30-Jul-19	31/07/2019		Complete	· The hypo dosing line runs across the top of the ceiling. This increases the chance of operator contact with the solution should a leak occur in the line · The site shed contains material and objects that is untidy and can present a trip hazard			Line has been moved and shed housekeeping has been complete		
30	Mendooran	Safety	R&D	Investigate methods to maintain a higher pressure in the eyewash station water line. This may include: · Booster pump · Constance pressure valve	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	MEN010	2014	High	Supervisor South	27-Jun-19			Complete	The eyewash station experiences low pressure.			No longer an issue following change from town water to service water		
31	Dunedoo	Safety	Minor works	· Ensure that open pits have appropriate handrailing/fencing/bollards installed around the pit perimeter · Ensure confined spaces have appropriate signage installed · Remove redundant material from the site shed and ensure it is kept tidy and de-cluttered · Remove redundant signage from the site relating to chlorine gas and install signage appropriate to hypochlorite · Routinely (weekly) test operate the safety shower to flush the line and ensure that it is operating reliably. · Test and monitor the safety shower water temperature to ensure that it complies with the appropriate Australian Standard. · Tidy switch room and either dispose of redundant equipment or store at the council depot. · Cover and lock the below ground access to the decommissioned bore.	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	DUN011, DUN012, DUN013	2014	High	Supervisor South	27-Jun-19			Closed	There are various safety hazards on site relating to the following issues: · Valve pits · Confined spaces · Housekeeping · Signage The safety shower is located outdoors and in an area exposed to sunlight			Open pits have been covered. Consultant to be engaged to develop Confined Space register. Site has been tidied and redundant equipment removed. Hypochlorite signage has been added, gas signage removed. Decommissioned bore has been covered and locked Action closed, with outstanding items covered by action 336 and 337	Safety showers to be regularly tested (covered under action 336) Confined spaces to have appropriate signage (action 337)	
32	Kenebri	Safety	Minor works	· Ensure the water tank support structure integrity is inspected and repair as required · Remove redundant materials from the site shed and maintain housekeeping · Install signage on the access gate and chlorine dosing room indicating that hypochlorite is stored and in use · Install a fire extinguisher on site and appropriate signage, including a contact list in case of an incident or emergency	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	KEN008	2014	High	Supervisor Treatment	24-Jul-20	30/06/2020		Complete	There are several site hazards that need to be controlled to reduce the potential for injury to personnel			New reservoir to be established on the ground. Current system to be demolished and decommissioned. 13/12/19: New reservoir is in place. Demolition of old reservoir being arranged 28/2/20: Getting quotes for removal of old reservoir. Signage is being organised. Fire extinguisher to be installed and added to schedule to inspect (Property Officer) 24/4/20: Signs ordered for all sites, hazmat tubes to be installed. Fire extinguishers planned to be installed in May 24/7/20: old reservoir demolished; shed repaired; signage & HAZMAT info installed; fire extinguisher installed (as well as BUG) with 6-monthly service this month		
33	BUG, KEN	Safety	Minor works	Ensure the plant has an eyewash station or kit should an incident occur with the hypochlorite dosing system.	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	KEN009, BUG011	2014	High	Supervisor North	13-Dec-19	31/10/2019	was 30/9/19	Complete	There is no safety shower on site			Currently investigating all shower / eye washes (North) 13/12/19: Portable eyewash station has been purchased		
34	Bugaldie	Safety	Minor works	Ensure the water tank support structure integrity is checked and repaired as required Install a fall arrest or ladder cage to reduce the chance of a fall when accessing the reservoir Install a lockable cover at the base of the ladder to prevent unauthorised access Install a handrail around the tank platform	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	BUG008	2014	High	Supervisor Treatment	24-Jul-20	30/06/2021		Closed	The reservoir ladder and support structure does not contain any of the following: · Fall arrest system · Cage · Lockable cover · Handrail around the outside edge These risks made higher given the fact that the site is easily accessible to the public			Structural integrity to be investigated further. Rest of action covered by action 333 WHS access upgrades (does not include structural integrity of support structure) 27/9/19: ladder is off the ground --> manproof fence? WEARS looked at tank stand integrity 13/12/19: Still to be investigated 28/2/20: Consider replacement of tank with onground reservoir with pump and back-up generator to remove working at height risk. Consider as part of risk assessment 24/7/20: do similar set-up to KBI - approx. $20k; quote for fencing received; closed as included in new action A352	Consider as part of reservoir upgrade program.	
35	BAR, DUN, KEN	Security		Ensure facility is securely locked, public access is prevents and all access ways are secured when the operators are not onsite	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	BAR011, DUN010, KEN007	2014	High	Supervisor North; Supervisor South	30-Jul-19			Complete	The facility has poor security, is sometimes left unlocked with unattended and/or is easily accessible once inside the compound			All sites are locked, electronic keys have been installed for all sites.		
36	Mendooran	Security	Minor works	Install a lockable door and ensure access to the treated water tanks and/or pumps are secured and locked to reduce risk of damage	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	MEN011, MEN012	2014	High	Supervisor South	27-Jun-19			Complete	Critical equipment is currently exposed/unsecured			Completed April 2019		
37	BWY, BUG, CLH, MDN, KBI	Signage	Minor works	Install signage on the front entrance to indicate Plant contact details and hazardous materials are stored on site. Install appropriate signage displayed that indicates the following information: · Chemical contained within the room · Chemical UN no. · Chemical category/classification with appropriate symbol Install a fire extinguisher with appropriate signage on site and include an emergency contact list in case of an incident or emergency	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	BIN008, BIN015, BIN016, BUG010, COH011, MEN013	2014	High	Supervisor Treatment; Technical officer	24-Jul-20	31/03/2020		Complete	Insufficient signage on site entrance and/or chemical dosing and storage rooms The front entrance gate currently has no signs installed indicating that there are hazardous materials stored on site There is insufficient signage on the alum and soda ash chemical storage and dosing facilities			MND, CLH entrances have signage; 27/9/19: SS not heard from supervisors; GR to advise on BWY; added KBI; BUG/KBI have liquid chlorine only; HAZCHEM signs at most places (BUG/KBI) + need SDS on site in folders (AM will do himself next week) 28/2/2020: HAZCHEM signs installations are being installed. Fire extinguishers to be arranged. 24/4/20: Fire extinguishers planned to be installed in May. All have HAZCHEM boxes, signs are been ordered. 24/7/20: complete		
38	Mendooran	Catchment & Abstraction	Investigations	Continue to investigate sanitary quality and security of back-up bores aquifer.	3.1	Preventive Measures and Multiple Barriers	CWT report May-15		Jan-2015	Very High					Complete	(Section 4.1, p.6 of CWT report)					
39	All		Documentation / Protocol	The identification and evaluation of preventive measures should be internally reviewed 12 months. Every five years (or upon any significant changes to any of the water supply systems) Council should undertake a comprehensive review. The review should also consider whether existing control measures are being undertaken, their effectiveness and whether they are appropriately documented and formalised. The review process and records of the outcomes of these reviews should be documented.	3.1	Preventive Measures and Multiple Barriers			Sep-2016	Low	Manager Warrumbungle Water	24-Apr-20	31-Oct-20		Closed				Risk assessment review to be completed as part of NSW Health DWMS project (Hunter H20) 24/4/20: As part of NSW Health project, commencing, dependent on COVID restrictions for initial site visits 24/7/20: closed as included in new action A351	Schedule to be reviewed as part of DWMS review and update (action 334)	
41	BIN, BUG, CBN, KEN	Catchment & Abstraction	Minor works	Timor Dam fence was damaged during the bushfires. Animal ingress is possible, fence to be replaced. Follow up with Council engineer the status of the fence replacement program. Some funding is available from insurance claim.	3.1	Preventive Measures and Multiple Barriers	Risk assessment	1.05	Mar-2015	High	Supervisor North	13-Dec-19	31-Dec-19		Complete	Walked fence line to assess extent of damage; Started re-erecting fence in some places; budget ran out in FY15/16?			Most of the fence has been repaired. Remaining repairs have been scheduled (December 2019, ID 25) 13/12/19: Fencing has been complete		

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
42	Coolah	Reservoirs	Investigations	It is recommended that Council assess the reservoir and determine whether the reservoir can be brought up to standard cost effectively. Some improvements were made to the roof/flashings several years ago but there remains significant security issues which would allow entry of birds and vermin into the reservoir. Assessment should evaluate whether the reservoir can be effectively bird/vermin proofed or whether the roof and roof structure need to be replaced. Part of this consideration will be accessibility for diving contractors, whether hatches meet current standards and how any level sensors/telemetry cables or other roof penetrations can be weather proofed. Hatches/entry points should extend a minimum of 100mm above the roof line to exclude stormwater and should be able to be locked to prevent unauthorised entry. As the reservoir is showing signs of leakage some consideration should also be given to structural soundness and whether the reservoir can be lined/waterproofed. A young tree growing immediately adjacent to the reservoir should be removed to prevent any potential damage by roots. Other trees in the immediate vicinity that could drop branches onto the roof should have branches removed that pose a foreseeable threat. This would also help to reduce potential contamination of the reservoir from leaf drop.	3.1	Preventative Measures and Multiple Barriers	DPI Inspections	DPI COH003	Jan-2019	High	Project Engineer	27-Aug-19	31-Oct-19		Complete				Entry hatches have been replaced (May 2019) Structural assessment has been undertaken. Integrity issues complete Tender to be prepared to undertake external concrete repairs. Reservoir to be replaced FY23/24	Tender to be prepared to undertake external concrete repairs.	
43	BUG, KEN	Reservoirs	Operations	Inspect elevated water tanks and ensure that they are vermin proof/ secure them from contamination.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	13-Dec-19			Complete	2018-05: BUG: Operational staff used drone to inspect tank. This revealed a collapsed roof which was repaired. KBI: Reservoirs are due for replacement due to structural issues of the tank stand.	Martin St reservoir represents a high risk to the drinking water reticulati check with neighbouring Councils? Gil? Send email to all; AM to look at it (email); approach: inspect first, then act accordingly		BUG is secure KEN system to be replaced by end of September 2019 (ID 3) 13/12/19: Kenebri system has been replace with two tanks and pump (completed in October 2019)		
44	Bugaldie	Disinfection	Investigations	Establish the maximum flow rate and confirm CTs.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	29-Aug-18			Complete	2018-05: Refer to recommendation above. Bligh Tanner estimation re flow rate appears accurate.	doubling up from extreme				
45	Baradine	Reservoirs	Operations	Clean reservoir to remove sediment.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	29-Aug-18			Complete	2018-05: Planned to occur in week 18/06/18.	done				
46	Baradine	Disinfection	Operations	CT/clear water tank contamination: Discuss need for precautionary boil water alert with PHU/DPI Water OR increase chlorine concentration to 4 mg/L to maximise CT.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	27-Jun-19			Complete	2016-10: None of this was done as considered not necessary by Manager WW-Operations & DTS after consultation with DPI Water (reason?). 2018-05: The CCP target for disinfection was 1.4 - 1.5 mg/L as of 3/2018 but is higher on average (1.55), new target after DWMS meeting: 1.4 - 1.8 mg/L. Reservoir mixer will be installed in FY2017/18.	Follow up discrepancy between chlorine measurements at plant and in retic --> SS; NaOCl absorption issue Fe/Mn - dose prior to clarifier (e.g. run into the launder) BUT increased clarifier corrosion --> AM; recalc/confirm current CT (tank dimensions); install inline static mixer (increase baffle factor??? NO); relocate service to retic main; next customer; increase baffle factor in tank by modification if still required; WIS circular 18 (including bunding of chemical tank/reduce size of tank); self bunding tank - SS	*Need to measure clear water dimensions and inspect baffling system or find drawings*	Integrity issues have been fixed (May 2019). Actions marked as complete. Separate action 326 to review CT.	
47	CLH, DUN	Catchment & Abstraction	Major works	Decommission the abandoned bore (CLH). Decommission the old well in the WTP building (DDO).	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high		29-Aug-18			Complete	2016-10: bore openings covered (photographic evidence available); 2018-05: Q - is 'decommissioning' different to 'sealing bores'?	what does decommission mean?; is the level off the bores? Not well??				
48	BUG, BDN, KBI	Catchment & Abstraction	Investigations	Bore investigations (integrity, capping, geology, exclusion zones - fencing)	3.1	Preventive Measures and Multiple Barriers	Risk assessment	1.03	Mar-2015	High	Supervisor Treatment	24-Jul-20	30-Jun-21		Closed	integrity/capping being looked at; BUG no fence around bore (allocate budget); KBI/BUG septic on bore side of house --> septic tank register/inspection (regulatory services); NSW Health testing should start; BUG deep/KBI a bit shallower 31/10/2018: Supervisor North; quotes for BUG fencing; Manager talk to regulatory services			Contractor to inspect first week of September 19, and provide quote to address integrity issues at bores (BUG, BAR, KEN) 13/12/19: Inspections have been carried. 28/2/20: Works still to be undertaken. Oriana project to review and fix bore casings. 24/7/20: fencing BUG see item 34; assume no (updated) septic tank rgister or mgt system within Council; bore integrity covered as part of reservoir upgrade project - WEARS to provide quotes; OWUA project: need update from OWUA (issue PO for our contribution); closed as included in new action A352	Consider as part of reservoir upgrade program.	
49	Baradine	Catchment & Abstraction	Minor works	Cap the abandoned bore.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Medium		29-Aug-18			Complete		2018-05: One bore has been capped, two other openings have been closed with rubbered flanges. 2019-05: need to investigate (considering depth of bore) how concrete capping can be realised				
50	BUG, BDN, KBI	Catchment & Abstraction	Investigations	Private water bore inspections, bore register	3.1	Preventive Measures and Multiple Barriers	Risk assessment	1.03	Mar-2015	High	Manager Warrumbungle Water; Technical Officer	30-Jul-21	31-Aug-21	Media Release	In progress	Can we obtain a list of private bores from DPI? Bruce Lamont to advise if DOI can give us a list (Dough Moorby did similar exercise)	contamination from same aquifer		13/12/19: Discussion at Oriana meeting and with NSW Health advised against providing any such communication due to perceived risk. Still considered to be a risk. Comms notice to also consider water security. 24/7/20: no progress; media release recommended 24/3/21: Media release to be prepared; Tech Officer to liaise WaterNSW re bore register & Doug Moorby 30/7/21: private bore inspections not intended; some bore information can be obtained from Water NSW; Media release to be prepared	Consider Media / comms for residents on importance of water security and contamination of bores, sustainability. Investigate information available on the subject (Tech Officer)	
51	Baradine	Disinfection	Major works	re CT: Change reticulation configuration so all water must go though reservoir prior to delivery to town OR install new chlorine contact tank of sufficient size to provide adequate CT.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	27-Jun-19			Closed	2016-10: Alternative and less costly suggestion to improve CT and guarantee appropriate disinfection: modify end of inlet pipe into clear water tank (e.g. perforated cap/pipe extension) for better distribution of inflowing water into tank. 2018-05: Need to measure clear water tank dimensions and assess current baffling system/find drawings to calculate CT more accurately; increase chlorine dosing to 2mg/L - need to notify residents in advance.	doubling up from extreme; an additional tank could be installed above ground between filters and underground clear water tank, dose chlorine in it --> increase CT (AM to investigate)		Action closed. Refer to action 326		
52	Mendooran	Catchment & Abstraction	Operations	Inspect the (back-up) bore and ensure integrity.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16			Very high	Supervisor South	27-Jun-19			Complete	Supervisor South - to check integrity 2016-10: Note - Intake is flood prone! 2018-05: Back-up bore not being used, control philosophy needs to be established.			Integrity of back up bore has been checked and is not an issue		
53	All	Distribution	Investigations	Identify high risk areas for backflow prevention (i.e. STP)	3.1	Preventive Measures and Multiple Barriers	Risk assessment	10.01	Mar-2015	High	Manager Warrumbungle Water; Supervisor Retic; Technical Officer	30-Jul-21	31-Aug-21	ELT report	In progress	Need backflow prevention policy Regulatory services police (that they do it properly); need RPZ register (including inspection intervals) STPs, SPSs, dump points, parks/gardens (chemicals) - standards? Hospitals, dentists,	consultant to develop? Get proposals (e.g. Key environmental) Supervisor North to get proposals//funding (SS follow up with Mark Nave)? Check with regulatory services if this is done		Policy and register and inspection program still to be developed 13/12/19: Engaged consultant, to review documents produced 28/2/20: Policy and procedure produced and reviewed. Council to adopt. Consultant also developing register, which should identify high risk areas. 24/7/20: backflow policy and register drafted, however finalisation cannot occur until fees/charges are clarified and Council internal register set-up + admin resources allocated (Tech Officer positon currently vacant) 24/11/20: as above 25/3/21: Tech Officer to finalise register in collaboration with Supervisor Retic (currently vacant); Manager to draft ELT report re implentation recommendations 30/7/21: Backflow policy to be finalised incl backflow register; then communcation to owners need to occur re implementation; requires admin support	Tech Officer liaise with consultant and investigate setup register in council systems (Authority)	
54	BAR, BIN, CBN, MDN	Coagulation & Flocculation	Minor works	Online interlocks for pH and turbidity on outlet for filters	3.1	Preventive Measures and Multiple Barriers	Risk assessment	3.02	Mar-2015	High	Manager Warrumbungle Water	28-Feb-20	30-Jun-21		Closed	MDN has interlock; rest discussed - will be with upgrades (SCADA/Automation)			Scheduled as part of automation project. Project plan ID 35 28/2/20: Scoping study is underway Closed, as part of automation project (action 328)	To be included as part of process monitoring, automation and instrumentation project (action 328)	
55	All	Whole of System	Investigations	Electronic key system currently being investigated	3.1	Preventive Measures and Multiple Barriers			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Complete	Manager WW - Operations/ Manager Property & Risk?	In FY16/17 budget for CBN **sewer** sites only		Complete first week of August 2019		
56	Bugaldie	Distribution	Investigations	Consider options to improve water pressure to limit risk of ingress into reticulation mains.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Medium	Technical Officer	30-Jul-19			Closed		2018-05: Note - in light of this comment, replacement of KBI system with BUG like system is not advisable?		Not considered viable.		
57	Mendooran	Catchment & Abstraction	Investigations	Assess the need for additional barriers to be implemented in the catchment area to protect raw water quality.	3.1	Preventive Measures and Multiple Barriers	CWT report May-15		May-2015	High		01-Mar-19			Closed	(Section 4.1, p.6) riparian zone next to river; educate farmers/pump up from river to troughs; stock routes? - rangers; cannot enforce	check this section out; 5km upstream from intake; unrealistic; procedure: high rain event switch over to bore to min risk!	Cannot do. Action closed			
58	Baradine	Reservoirs	Minor works	re clear water tank: Establish integrity to prevent contamination/vermin ingress AND fix holes in WTP building to prevent vermin getting inside.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	27-Jun-19			Complete	Photographic evidence available. Needs more sustainable solution			Completed May 2019		
59	CLH, DUN	Catchment & Abstraction	Minor works	Seal the bores (incl. covering the abandoned one - CLH).	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor Treatment	24-Apr-20	6/03/2020		Complete	2016-10: Pictures with evidence/before-after comparison available. Expanding foam for operational CLH bore is only a temporary solution. 2018-05: Money included into capital budget FY18/19 to seal operational CLH bore (within frame of reservoir upgrade) and concrete cap abandoned bore, which has already been welded shut.	is there a standard for capping/plugging bores (AS) -- MG (chase with Dale); WIS to seal bores		Coolah bore to be capped (ID 15) 13/12/19: Current bores in Coolah have been sealed. Contractor has been engaged to cap bore at Coolah. 28/2/20: Dunedoo in a raised shed, is enclosed in shed. No gaps in integrity. 24/4/20: CBN has been sealed, Coolah sealed 24/4/20		

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
60	Kenebri	Disinfection	Investigations	Determine configuration of tanks and re-configure to be in series if possible to increase CT.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	27-Jun-19			Closed	2018-05: Tanks are currently not in series. The reservoirs require replacement. Replacement design will account for sufficient CT.	reservoirs require replacement, $100k budgeted in FY2018/19, quote received; pump energy cost will increase with intended set-up		To be progressed 27/9/19: covered under ID 43 (new tanks should have sufficient CT - more than BUG)		
61	BUG, KEN	Catchment & Abstraction	Minor works	Seal the bore (BUG)/ borehead (KBI).	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	30-Jul-19			Closed	2016-10: Operational staff performed temporary sealing (photographic evidence available) 2018-05: More sustainable solution required (more durable/flexible/resistant sealant)	combine double ups?		Closed, covered by action 48		
62	Baradine	Reservoirs	Operations	re clear water tank: Thoroughly clean the WTP building to remove all bird faeces (care to be taken to not allow cleaning water to enter the clean water tank).	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	27-Jun-19	31-Oct		Complete	2018-05: Note - inside of walls cannot be cleaned due to the wall material being asbestos + most areas located in very high places/inaccessible. Obtained a quote to upgrade clear water tank to comply with Circular 18, including cleaning, included in FY2018/19 capital budget.			Majority cleaned (all droppings around CWT have been removed, only high areas on asbestos). Have repaired holes to prevent further ingress by birds/vermin. Budget to replace external walls (FY19/20) to help prevent further ingress/WHS issues. 13/12/19: External work to remove asbestos has been differed. Waiting on clarifier status. Majority has been cleaned, action closed, no other short term actions available		
63	Baradine	Reservoirs	Minor works	Repair reservoir to prevent vermin ingress.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	WIS	27-Jun-19			Complete	2018-05: Obtained quote to upgrade reservoir to comply with Circular 18 + included in FY2018/19 capital budget.			Completed May 2019		
64	Baradine	Catchment & Abstraction	Minor works	Seal the operational bore.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Medium		27-Aug-19			Closed		2018-05: Temporary sealed by operational staff (with silicone), more sustainable solution required. 2019-05: part of WEAS engagement (confirm in scope)		Closed, covered by Action 48		
65	Binnaway	Reservoirs	Minor works	Ensure that the reservoir is adequately sealed from vermin and rainwater ingress.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	Manager Warrumbungle Water	24-Jul-20	31-Dec-20		Complete	2018-05: Obtained quote to upgrade reservoir to comply with Circular 18 + included in FY2018/19 capital budget.			Last inspected Feb 2019. Covered by action 333. 13/12/19: Have a quote for works to fix integrity. Contractor to be engaged 28/2/20: Purchase order given to contractor. Waiting for contractor to schedule site visits. 24/4/20: Have manufactured required hatches, postponed due to COVID restrictions (unable to cross border) 27/4/20: WEARS been on-site and installed new hatch; reservoir sealed (however WEARS needs to come back to replace again due to slight error in measurements)		
66	CBN, MDN	Reservoirs	Minor works	Seal all points of ingress into the clear water tank AND Establish integrity of all reservoirs.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	WIS	30-Jul-19			Complete	2016-10: Temporary sealing done by operational staff (photographic evidence present). 2018-05: Obtained quotes to upgrade tanks/reservoirs to comply with Circular 18 + included in FY2018/19 capital budget.			CBN and MDN clear water tank have been sealed Reservoirs integrity have been fixed		
67	CLH, DUN	Reservoirs	Minor works	Vermin proof the reservoirs.	3.1	Preventive Measures and Multiple Barriers	Bligh Tanner report Feb-16		Feb-2016	Very high	WIS TBD	30-Jul-19			Complete	2018-05: Obtained quotes to upgrade reservoirs to comply with Circular 18 + included in FY2018/19 capital budget.			Dunedoo reservoirs complete. Marked as complete, as Coolah reservoirs covered by action 185		
68	Baradine	Clear water tank	Major works	Seal the clear water tank against vermin and contaminants. Install bunds around the chemical dosing systems.	3.1	Preventative Measures and Multiple Barriers	Hunter H2O Audit 2014	BAR010	2014	High	Supervisor Treatment	24-Jul-20	13/04/2021		Closed	The clear water tank is not sealed/protected and is potentially exposed to chemical spills or vermin			CWT sealed. Bund has been purchased, waiting to be installed. 13/12/19 & 28/2/20: Bund installation waiting on recommendations for WTP upgrades/replacements (related to action 78) 24/7/20: see last comment; installation of bund + sump required in chem dosing arae (to put ot alum tank bund); installation of self bunded soda ash tank still outstanding; closed as included in new action A350	Bund to be installed, building modifications to be complete prior to installation.	
69	Mendooran	Filtration	Critical control point	Review filtration CCP to be in line with ADGW recommendation (<0.2 NTU).	3.2	CCPs	CWT report May-15		May-2015	Very high		29-Aug-18			Complete	2016-10: (Section 3, p.5 of CWT report); CCP reviewed by Bligh Tanner (Jan-16); target reduced to <0.3 NTU (from <0.5), recommended: lower CCP 'with water quality triggers' (for BW?) 2018-05: CCP of <0.2 NTU has been adopted.					
70	CLH, DUN	Disinfection	Critical control point	Implement high level action and critical chlorine limits in CCPs	3.2	CCPs	Bligh Tanner report Feb-16		Feb-2016	Very high					Complete	Refer to current CCP reference guide					
71	All		Documentation / Protocol	The HACCP Summary Tables should be made readily accessible to operators (e.g. pinned up at the treatment plants and Council offices).	3.2	CCPs			Mar-2015	High	Manager Warrumbungle Water; Technical Officer	30-Jul-19			Complete	CCP tables were supplied to supervisors/operators; however, only some plants (Binnaway, Kenebri, ..) had them displayed during Bligh Tanner's site visits in Jan-16. Manager WW - Special Projects provided updated CCP tables to Technical Officer for re-distribution to supervisors/operators again with clear instructions (Tech Officer to document this in spreadsheets).			CCP tables displayed at all sites. Laminated CCPs in trucks of distribution staff. Staff now also highlighting sheet entries (hardcopy) if outside target.		
72	All		Critical control point	The identification of CCPs and Critical Limits should be reviewed every year, and upon any significant changes to any of the water supply systems. The formal review process and records of the outcomes of these reviews should be documented. The DWMS documentation should also be updated accordingly.	3.2	CCPs			Sep-2015	Medium	Manager Warrumbungle Water	29-Aug-18			Implemented	Complete 2016, due Jan-17	CCP review was performed by Bligh Tanner in January 2016 and documented in the DWMS Implementation Report				
73	BAR, BWY, CBN	Fluoridation	Critical control point	Council to include a fluoride CCP at Binnaway, Baradine and Coonabarabran, upon next review of DWMS.	3.2	CCPs			Sep-2015	Medium	Manager Warrumbungle Water	29-Aug-18			Complete	Bligh Tanner consultant, Manager WW - Special Projects	Was done by NSW Health consultant from Bligh Tanner in collaboration with Council.				
74	BWY, CBN, MDN	Sedimentation	Documentation / Protocol	Establish an Operational Control Point (OCP) for the settling lagoon	3.2	CCPs	Bligh Tanner report Feb-16		Feb-2016	Medium	Supervisor Treatment	30-Jul-21	30-Sep-21	13/3 (long term trends)	Implemented		2016-10: Undertake jar tests and confirm the appropriate coagulant dose; base change over between lagoons on outlet turbidity CBN: Introduce action limits on water quality requiring actions such as jar testing, optimising alum/polymer dose rates, switch between lagoons. MDN: enhanced management, e.g. when to undertake jar tests and switch between lagoons		27/9/19: turbidity; pH (e.g. should be 6-7 if alum is used) 28/2/20: Supervisor to propose OCP (>3 NTU, pH dependent on coagulant) 25/3/21: values determined for each lagoon system; need to be added to CCP reference guide 30/7/21: paper form list (with NTU and pH setpoints) to be forwarded to consultant to include in updated CCP reference guide 7/7/22 - CCP reference guide has been completed and updated by consultant.		
75	CBN, MDN	Sedimentation	Documentation / Protocol	Establish an OCP for the sedimentation lagoons.	3.2	CCPs	Bligh Tanner report Feb-16		Feb-2016	Medium	Manager Warrumbungle Water; Technical officer	27-Sep-19	31-Dec		Closed		2016-10: CBN: Introduce action limits on water quality requiring actions such as jar testing, optimising alum/polymer dose rates. switch between lagoons. MDN: enhanced management, e.g. when to undertake jar tests and switch between lagoons		27/9/19: refer to ID 74	Discuss setting OCP at quarterly review meeting. Technical officer to prepare long term trends	
76	BIN, CBN, MDN, CLH, DUN	Catchment & Abstraction	Critical control point	If sand bed demonstrates effective filtration consider making this a CCP	3.2	CCPs	Risk assessment	1.02	Mar-2015	Medium	Manager Warrumbungle Water	29-Aug-18			Closed		Comments: Raw water can only be accessed for testing pre- and post- natural sand bed filtration in BWY, CBN and MDN. The sand bed filtration is a natural process and cannot be controlled. Therefore, it will not be considered as CCP.				
77	Coonabarabran	Filtration	Critical control point	Review filtration CCP target and limits to be in line with ADWG recommendation (<0.2 NTU).	3.2	CCPs	CWT report May-15		May-2015	Very high	Supervisor Treatment	24-Jul-20	30-Jun-20		Complete	2016-10: (Section 2.1, p.4 of CWT report); CCP assessed by Bligh Tanner (Jan-16) but value not yet been lowered (currently target <0.8 NTU, recommended <0.3 'with water quality triggers') 2018-05: target set to <0.3 NTU in March 2018. Operators voiced concerns that this cannot be achieved once raw water turbidities increase. Requested funding through NSW Health to perform a filter media inspection to assess if media requires replacement.	filter inspection? NSW Health, Mark Nave to follow up; Hunter H2O BWY report to NSW Health; depends of funding from NSW Health, otherwise needs to come out of WTP renewal budget		Currently using emergency back up bores. Filter media inspection undertaken recently (never been replaced). Turbidity target limit has been changed to 0.3 NTU, operational limit 0.5 NTU. Will have difficulty in meeting limit when source water is changed to the dam water. 13/12/19: Following improvements to filter, reduced critical limit should be able to be achieved when source water is changed 28/2/2020: Filter needs to be refurbished prior to media replacement. Have repaired area where there was bypassing. Result have improved. HunterH20 is providing a proposal to assist with replacement with sourcing and quantities. 24/7/20: NTU constantly < 0.1 (previous gullet repair); however media replacement still required but target met	Filter upgrade	
78	Baradine	Filtration	Critical control point	Reduce CCP limits for turbidity AND initiate backwashes based on water quality	3.2	CCPs	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor Treatment	24-Jul-20	31-Dec-20		Closed	2016-10: CCP target got reduced to <0.2 NTU (from <0.8) 2018-05: Safe and Secure EOI submitted for 'Automation and Process Instrumentation Upgrade', including online instrumentation. Lab turbidity meter included in FY2018/19 capital budget. 2018-11: NTU meter purchased and in use			Limits previously reduced. Current iron and manganese issues (long term issue in winter) Limit of 0.2 NTU difficult to meet in winter. Started dosing chlorine dosing prior to clarifier, impact not yet seen. 27/9/19: HH2O will do filter inspection and trouble-shoot (Health project); settled water and filtered water NTU are currently the same(!); BW done every day, if increase in NTU another one is done 13/12/19: Filter inspection are complete, waiting on report. Filters need replacing. 28/2/20: Waiting on clarifier project to be resolved. NSW Health have been involved in discussions are reviewing with DPIE 24/4/20: Budget for filter replacement, however this needs to be replaced at same time as clarifier. 9 April 2020 teleconference held to discus Baradine clarifier with DPIE, waiting for DPIE to provide their advice in writing. 24/7/20: closed as included in new action A350	Waiting on clarifier and filter replacement	

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
79	Binnaway	Filtration	Critical control point	Set more challenging filtration CCP limits	3.2	CCPs	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor South	27-Jun-19			Complete	2016-10: CCP target got reduced to <0.6 NTU (from <0.8); BW needs optimising + filter media replacement (refer to recommendation under 'Equipment Calibration & Maintenance') 2018-05: Filter media replacement planned starting 25/06/18. 2018-07: filter media replaced			CCP limit reduced to 0.2 NTU (March 2019?) Filter media replaced (June 2018) Generally meeting new limits.		
80	All		Training	Relevant staff members must be trained to ensure they understand what the CCPs are and why they are important. This training should include use of the HACCP Summary Tables, associated target, Alert and Critical Limits, as well as the monitoring requirements to ensure the CCPs remain in control.	3.2	CCPs			Mar-2015	High	Manager Warrumbungle Water	30-Jul-19			Implemented	Managers WW - Operations & Special Projects, HR, Supervisors			Staff are trained as part of inductions. When CCPs are changed, updated CCP tables are provided and discussed at quarterly meetings (Supervisor/Team Leaders). Changes are passed on to operators via tool box talks.		
81	Mendooran		Critical control point	That WSC finalise draft CCPs provided the DWMS Implementation Report (Bligh Tanner, 2016) and include an additional WTP Final pH CCP	3.2	Critical Control Points	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented		pH COP introduced for Mendooran WTP. CCP cannot be implemented as pH cannot be controlled, only monitored. COP reference guide and introduction of final pH CCPs/COPs for Shire outstanding				
82	Mendooran	Wash water	Investigations	Consider a sedimentation stage with long residence times prior to returning the wash water to the inlet works. This may be achieved through installing baffles in the lagoon to reduce short circuiting	3.2	Critical Control Points	Hunter H2O Audit 2014	MEN007	2014	Medium	Manager Warrumbungle Water	24-Apr-20	30-Sep-20	Interim (finish concept design)	Closed	Wash water is directed to the sedimentation ponds for recovery. A concentration of contaminants unable to be removed in the sedimentation process may occur increasing the load on the filters			Covered by Mendooran water supply modification upgrade. Currently at concept design stage. Further funding will be needed for construction. 13/12/19: Consultant engaged to undertake concept design (site visit has already been undertaken - Nov 2019) 24/4/20: Consultant has submitted documentation (site constraint and design report). Have had meeting with Consultant on progress this week. Consultant to submit further information needed to progress. Action closed, as now covered into new combined Action 345	Find funding following concept design finalisation (liaise with DPIE)	
83	Coolah	Disinfection	Process	Implement process to identify when gas bottle is empty	4.1	Operational Procedures	Risk assessment	7.01	Mar-2015	High	Manager Warrumbungle Water; Supervisor North; Supervisor South	27-Jun-19			Complete	Automatic changeover between duty and standby bottle was implemented	follow up: scales for bottles (cost?)				
84	All	Reservoirs	Investigations	Assess compliance regarding reservoir access with Australian Standards and common sense	4.1	Operational Procedures	Risk assessment	9.01	Mar-2015	High	Manager Warrumbungle Water; Supervisor Treatment	28-Feb-20	30-Jun-20		Closed	Aqualift inspection was performed and report with recommendations supplied. BUG and KBI were not inspected. The report has been partially actioned on, further actions dependent on financial and staff resources (safely access issue)			Contractor has been engaged to assist with working at heights access to reservoirs. Work to improve access ongoing. 13/12/19: Engaged WEARS to undertake this work 28/20/20: Action closed as covered by new action 343	Follow up with WEARS	
85	All		Documentation / Protocol	Formally document any procedure related to existing control measures identified in the risk assessment that are not currently documented. Involve relevant staff in the development of these procedures.	4.1	Operational Procedures			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Closed				Hunter H20 is developing 12 SOPs (NSW Health support project) 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/2/20:Closed as covered by new action 339	To be included as part of action 339 develop SOPs system wide Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOP/SWMS	
86	All		Documentation / Protocol	Compile all SOPs into an operations manual	4.1	Operational Procedures			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19		See A15	Closed				Hunter H20 is developing 12 SOPs (NSW Health support project) 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/2/20:Closed as covered by new action 339	To be included as part of action 339 develop SOPs system wide Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOP/SWMS	
87	Mendooran	Sedimentation	Investigations	Investigate pH increase between raw and settled water.	4.1	Operational Procedures	CWT report May-15		May-2015	Medium	Supervisor Treatment; Manager Water	24-Apr-20	30-Sep-20	Interim (finish concept design)	Closed	(Section 4.2.3, p.11)			24/4/20: Consultant (CWT) has looked at issue current concept design, probably due to algae. Action closed, as now covered into new combined Action 345	Check that this issue is covered in recent CWT report and if any recommendations	
88	Mendooran	Disinfection	Investigations	Consider switching to chlorine gas disinfection.	4.1	Operational Procedures	CWT report May-15		May-2015	Medium	Manager Warrumbungle Water	24-Apr-20	30-Sep-20	Interim (finish concept design)	Closed	(Section 4.2.5, p.16)			Included as part of Mendooran upgrade 13/12/19: Consultant engaged to undertake concept design (site visit has already been undertaken - Nov 2019) 24/4/20: Consultant (CWT) has looked at issue current concept Action closed, as now covered into new combined Action 345	Refer to other action 171. Include pH and settled water investigations (action 87) Find funding following concept design finalisation (liaise with DPIE)	
89	MDN	Distribution	Documentation / Protocol	Implement a pro-active mains flushing program.	4.1	Operational Procedures	CWT report May-15		May-2015	Medium	Supervisor Reticulation; Technical Officer	30-Jul-21	31-Oct-21	Interim (order and print books)	In progress		(Section 4.3, p.17)		Schedules for Dunedoo still be developed. 27/9/19: waiting on Graham (flushing points DDO+MDN) 24/4/20: Flushing has been undertaken (exc Coolah and Dunedoo), but not formalised. Marty has picked points for a flushing program for all sites. Schedule to be put into a carbon copy book for each site for implementation 30/7/21: Carbon copy books still to be finalised	Order and print books	
90	All	Distribution	Documentation / Protocol	Develop a communication protocol around monitoring data (i.e. distribution data feeding back to WTP)	4.1	Operational Procedures	Risk assessment	10.01	Mar-2015	Medium	Manager Warrumbungle Water	01-Sep-15			Complete		Communication protocol is described in CCP document				
91	Coonabarabran	Filtration	Investigations	Confirm adjustments to backwash regime onsite to ensure they are effective.	4.1	Operational Procedures	CWT report May-15		May-2015	Medium	Manager Warrumbungle Water; Supervisor North	27-Sep-19	31-Dec-19		Closed		(Section 4.2.4, p.13)		Filter inspection undertaken identifying filter control issues. Refer to ID 150	Consultant to provide proposal to investigate. To be included as part of process monitoring, automation and instrumentation project (action 328)	
92	Coonabarabran	Disinfection	Investigations	Investigate the chlorine demand of the treated water in the reticulation to determine optimum chlorine dose at WTP.	4.1	Operational Procedures	CWT report May-15		May-2015	High	Supervisor South	27-Jun-19			Closed	2016-10: (Section 4.3, p.16 of CWT report)			No longer an issue (following mains replacement, flushing program etc.)		
93	All	Clarification/ Sedimentation	Investigations	Strategy needs to be developed for continued supply during times of significant maintenance (e.g. utilising the lagoons temporarily)	4.1	Operational Procedures	Risk assessment	4.01	Mar-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Closed				No longer considered necessary		
94	Mendooran	Distribution	Documentation / Protocol	The water supply system diagram (Figure 2.1.9 Mendooran System Flow Diagram) from the WSC DWMS (17th Oct 2014) be corrected and updated to accurately reflect the operational arrangement of the Mendooran Water Supply System.	4.1	Operational Procedures	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Supervisor South	22-Jan-19			Complete						
95	Coonabarabran	Disinfection	Operations	Target a lower pH for disinfection.	4.1	Operational Procedures	CWT report May-15		May-2015	High	Supervisor South	27-Jun-19			Closed	2016-10: (Section 4.2.5, p.16 of CWT report)			Action closed. pH within target range, with adequate CT.		
96	Coonabarabran	Filtration	Operations	Consider periodic inspection on filter media	4.1	Operational Procedures	Risk assessment	5.01	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented				Filter inspection carried out in June 2019		
97	Mendooran	Disinfection	Documentation / Protocol	That the EHO provides a copy of water quality results to WTP Operators at the time of onsite sampling and testing and/or leaves these results at the WTP. Any CCP exceedances or un-usual results recorded by the EHO are to be immediately reported to WTP Operators and W&S Manager.	4.1	Operational Procedures	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Supervisor South	22-Jan-19			Complete						
98	All	Reservoirs	Investigations	Consider reviewing mixing options for reservoirs with common inlet/outlet	4.1	Operational Procedures	Risk assessment	9.01	Mar-2015	Medium	Manager Warrumbungle Water; Supervisor Treatment	30-Jul-21	30-Jun-20	Interim (determine reservoirs & engage)	Closed				24/4/20: Consultant has provided a proposal to look at mixing options. Binnaway reservoir has issues with water age. Other reservoirs with issues are included as part of other projects or are scheduled to be replaced. Reservoirs with C.t issue to be considered. 30/7/21: BDN res had a mixer installed in 2018; MDN Coolabah res are being looked at as part of funded future plant upgrade; BWY has diffent inlet to outlet; CLH Martin St res to be replaced in FY23/24 and Wentworth Ave res are looked at then (as potential new main site); DDO Rhodes St are being looked at re replacement (current CAPEX), Bullinda St has separte in/out; CBN res all have separate in/out; KBI/BUG have separate in/out --> new actions for Coolah and Dunedoo reservoirs A355 and A356		

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
99	Coonabarabran	Distribution	Monitoring	Consider sampling and testing program following mains repairs	4.1	Operational Procedures	Risk assessment	10.01	Mar-2015	Medium	Manager Warrumbungle Water	24-Apr-20	31-Dec-19	Interim deadline	Closed		This should be covered in relevant SOPs (Repair a water main break, Replace a water main) --> need to verify if this is the case		SWMS has been developed for main repairs. Testing is being undertaken for chlorine and turbidity following repairs. 24/4/20:Action closed as requirements of this action have been included in action 339 Develop System wide SOPs	SOP to be developed for pipe break repairs (and include monitoring) To be included as part of Action 339.	
100	Coonabarabran	Distribution	Operations	Consider tanker filling from dead ends (if backflow prevention available)	4.1	Operational Procedures	Risk assessment	10.03	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented		Note: Especially relevant during times of water restrictions		Weekly flushing program in Coonabarabran (while high level restrictions are in place)		
101	ALL	DWMS	Documentation / Protocol	Insert location of and quality information (i.e. version, last review date, Document owner) for existing operational procedures into the DWMS Document Register (Include review date, date created, responsible person, etc.) found in Appendix D of the DWMS.	4.1	Operational Procedures			Mar-2015	High	Manager Warrumbungle Water	27-Jun-19			Closed				Closed as covered by under new action 334, review and update DWMS.	Include as part of DWMS review and update (action 334)	
102	Mendooran		Documentation / Protocol	That WSC review its current organisational structure with a view to ensure that the management of WTP Operators and reporting lines of communication actively support the ongoing implementation of its DWMS and CCPs. WSC should then formally document the adopted organisational structure, clearly communicating roles and responsibilities of all staff relating to the management of drinking water quality.	4.1	Operational Procedures	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented		Draft structure water and wastewater has been developed, discussed and partially implemented				
103	ALL	DWMS	Documentation / Protocol	Review operational procedures to determine what other procedures need to be developed in relation to managing drinking water quality (e.g. operational and maintenance processes for main breaks)	4.1	Operational Procedures			Mar-2015	High	Manager Warrumbungle Water; Supervisors	28-Feb-20	31-Mar-20		Closed	Waiting for standard SOPs being developed by NSW Health			Hunter H20 is developing 12 SOPs (NSW Health support project) 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/2/20:Closed as covered by new action 339	To be included as part of action 339 develop SOPs system wide Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOP/SWMS	
104	Coonabarabran	Aeration & Oxidation	Operations	Implement SOP for batching and dosing	4.1	Operational Procedures	Risk assessment	2.02	Mar-2015	High	Supervisor North; Supervisor South	28-Feb-20	31-Mar-20	Interim	Closed				Hunter H20 is developing 12 SOPs (NSW Health support project) 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/2/20:Closed as covered by new action 339	To be included as part of action 339 develop SOPs system wide Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOP/SWMS	
105	Coonabarabran	Filtration	Documentation / Protocol	Develop SOP for filter maintenance	4.1	Operational Procedures	Risk assessment	5.01	Mar-2015	High	Manager Warrumbungle Water; Supervisor North; Supervisor South	28-Feb-20	31-Mar-20		Closed				Hunter H20 is developing 12 SOPs (NSW Health support project) 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/2/20:Closed as covered by new action 339	To be included as part of action 339 develop SOPs system wide Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOP/SWMS	
106	Coonabarabran	Reservoirs	Operations	Consider a routine reservoir inspection (checking locks etc.)	4.1	Operational Procedures	Risk assessment	9.01	Mar-2015	High	Manager Warrumbungle Water; Supervisor North; Supervisor South	27-Jun-19			Closed				Closed. Weekly inspection, recorded in plant diary. Refer to action 310.		
107	Coonabarabran	Reservoirs	Documentation / Protocol	Develop SOP for the access of reservoirs	4.1	Operational Procedures	Risk assessment	9.01	Mar-2015	High	Manager Warrumbungle Water; Supervisor North; Supervisor South	28-Feb-20	31-Mar-20		Closed				Hunter H20 is developing 12 SOPs (NSW Health support project) 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/20/20: Action closed as covered by new action 343	To be included as part of action 343	
108	Coonabarabran	Distribution	Documentation / Protocol	Develop SOP around distribution failures such as main breaks, sufficient flushing, cleaning of tools	4.1	Operational Procedures	Risk assessment	10.02	Mar-2015	High	Manager Warrumbungle Water; Supervisor North; Supervisor South	28-Feb-20	31-Mar-20		Closed	Need to verify if SOPs exist for mains/service breaks/failures and if they are used (available to staff)			Hunter H20 is developing 12 SOPs (NSW Health support project) 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/2/20:Closed as covered by new action 339	To be included as part of action 339 develop SOPs system wide Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOP/SWMS	
109	Coonabarabran	Distribution	Documentation / Protocol	Consider developing a notification procedure for mains breaks	4.1	Operational Procedures	Risk assessment	10.02	Mar-2015	High	Manager Warrumbungle Water; Supervisor North; Supervisor South	28-Feb-20	31-Mar-20		Closed				Hunter H20 is developing 12 SOPs (NSW Health support project) 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/2/20:Closed as covered by new action 339	To be included as part of action 339 develop SOPs system wide Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOP/SWMS	
110	All	Distribution	Documentation / Protocol	Consider closing household property meters prior to recommissioning mains	4.1	Operational Procedures	Risk assessment	10.02	Mar-2015	High	Supervisor North; Supervisor South	28-Feb-20	28-Feb-20	Interim (action 339)	Closed	Should be covered in relevant SOPs (Repair a water main break, Replace a water main) --> need to verify if this is the case			Hunter H20 is developing 12 SOPs (NSW Health support project) 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/2/20:Closed as covered by new action 339	To be included as part of action 339 develop SOPs system wide Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOP/SWMS	
111	Coolah and Dunedoo	Distribution	Documentation / Protocol	Finalise flushing schedule for remaining systems (CLH, DDO nothing currently in place)	4.1	Operational Procedures	Risk assessment	10.03	Mar-2015	High	Supervisor South	30-Jul-19	31-Oct-19		Complete				Schedules for Coolah are to be printed first week of August. Dunedoo to still be developed. Action closed as covered by action 89.		

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
112	CBN	Distribution	Documentation / Protocol	Consider scouring program, including prioritisation of mains to be scoured	4.1	Operational Procedures	Risk assessment	10.03	Mar-2015	Low	Manager Warrumbungle Water; Supervisor Reticulation	24-Mar-21	31-Dec-20	Risk assessments	Complete				Scouring types investigated. Need for scouring to be evaluated. Priority reduced to medium, flushing has resulted improvements. 13/12/19: Due to improvements seen from flushing program, scouring program may not be immediately needed 24/4/20; A number of areas with previous problems, mains have been replaced. With flushing program improvements priority reduced to low. Issue to be discussed at risk assessment. 25/3/21: budget for Shire wide over the next years	Re-evaluate the need in the risk assessment	
113	Coonabarabran	Manganese removal	Investigations	Monitor raw and treated water soluble and total manganese concentrations and determine optimum potassium permanganate dosing ratio and pH.	4.2	Operational Monitoring	CWT report May-15		May-2015	Very High		29-Aug-18			Complete	(Section 4.2.1, p.6/7), total Mn in treated water (0.4 - 0.7 mg/L) exceeds ADWG of 0.1 (many WTP prefer <0.02 to prevent dirty water complaints); additional lab equip. needed: Nalgene hand pump + vacuum flask with filter + 0.2mm filter papers; typical dosing ratio KMnO4:soluble Mn = 2:1, if organics present 10:1, pH >8.5 favours oxidation	may need better quality KMnO4; pH will drop with chlorine gas as opposed to NaOCl				
114	Mendooran	Process Control	Investigations	Review of processes controlled by the PLC by a suitably qualified person in conjunction with the PLC programmer to optimise the process and ensure the process functions as designed. Ensure alarms or telemetric functions leaving the plant are reviewed and addressed as a priority so that operators can respond quickly to alarm situations in the plant and so that managers have the capability of monitoring plant performance and trends.	4.2	Operational Monitoring	DPI Inspections	DPI MEN002	Jan-2019	High	Supervisor South	28-Feb-20			Complete		It is apparent that processes controlled by the PLC need to be reviewed to ensure proper plant function. An example of this is the filter backwash function which was allowing incorrect flow rates at drain down and backwash cycles. A suitably qualified person who understands the process needs to work in conjunction with the PLC programmer to optimise the process and ensure the process functions as designed. It is also noted that currently there are no alarms or telemetric functions leaving the plant although the plant manuals suggest the capability already exists. This situation needs to be reviewed and addressed as a priority so that operators can respond quickly to alarm situations in the plant and so that managers have the capability of monitoring plant performance and trends.		28/2/20: Looked at PLC setup, external text message alarms have been added. Filter backwash function has been corrected in PLC. A number of issues were also rectified in the PLC program.		
115	Coonabarabran	Performance monitoring	Documentation / Protocol	Improve WTP record keeping so that major plant changes/issues can be reviewed.	4.2	Operational Monitoring	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	27-Jun-19			Closed	2018-05: not sure what this is referring to. The operators complete carbon copy books with daily operational data and keep a plant diary that is kept at the plant.			Action closed. Records kept in carbon copy book kept at WTP, including comments.		
116	CBN	Monitoring	Documentation / Protocol	Develop formal monitoring protocols which identify target criteria for each of the preventive measures being monitored (including CCPs), monitoring records to be kept, responsibilities, authorities and required communication protocols. Combine documented protocols into a **formal Operational Monitoring Plan**.	4.2	Operational Monitoring			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-21	31-Aug-21	review proposal	Complete				Schedules are captured currently on operational carbon copy books 24/4/20: Consultant has provided proposal to develop operational monitoring plan for all systems 310/7/21: get separate proposal & review 07/07/22 - Developed as part of the CCP reference guide.	Review proposal to develop monitoring plan	
117	Coonabarabran		Documentation / Protocol	Ensure all operational procedures are documented and referenced in the DWMS document register	4.2	Operational Monitoring			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Closed				Closed refer to action 334 and 339	Include as part of DWMS review and update (action 334)	
118	Coonabarabran	Catchment & Abstraction	Monitoring	Consider turbidity monitoring of infiltration well water and river water on event basis to determine effectiveness of filtration	4.2	Operational Monitoring	Risk assessment	1.02	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented				Combined raw water testing daily undertaken of current water source (NTU, pH, colour). Raw water quality assurance program in place (micro, chemicals) for all bores as part of NSW Health funding.		
119	Coonabarabran	Catchment & Abstraction	Monitoring	Consider testing for E. coli in raw water	4.2	Operational Monitoring	Risk assessment	1.04	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented				Raw water quality assurance program in place (micro, chemicals) for all bores as part of NSW Health funding.		
120	Coonabarabran	Catchment & Abstraction	Operations	Monitor raw water organics and nutrient loading.	4.2	Operational Monitoring	CWT report May-15		May-2015	Medium	Technical Officer	24-Apr-20	29-May-20	Interim deadline was 30/9/19 (review RWQ assurance program)	Closed		(Section 4.1, p.6), note: additional treatment processes may be required due to contamination through agricultural activities (farming, fertiliser application, cattle access to waterway)		Raw water quality assurance program in place (micro, chemicals) for all bores as part of NSW Health funding. Combined raw water testing daily undertaken of current water source (NTU, pH, colour). BGA testing during summer period. 13/12/19: Some baseline samples still to be taken (Health officer has since left). RWQ plan still to be reviewed for this requirement 24/4/20: Still to be reviewed and sampling plan developed	Review raw water assurance program against this requirement see items 120, 253, 287, 313)	
121	CBN	Coagulation & Flocculation	Monitoring	Monitor algae concentrations in the raw water and sedimentation lagoon. --> part of RWQ procedure (algae torch to be purchased) Action 248: Operators to re-familiarise themselves with BGA Management Protocols and related response actions. --> **part complete** (charts on CBN WTP wall) Action 292: Consider additional testing for taste and odour issues (MIB and Geosmin, chlorophyll-a (algae), pH, organic loadings and nutrient levels)	4.2	Operational Monitoring	CWT report May-15		May-2015	Medium	Supervisor Treatment	30-Jul-21	30-Sep-21		In progress		(Section 4.2.2, p.10)		BGA testing during summer period in raw water. 27/9/19: will test monthly in lagoons over summer 13/12/19: Have been using PAC. Testing not yet undertaken 24/4/20: Only raw water testing undertaken. Testing of lagoon not yet tested. No taste and odour complaints. PAC being dosed at Coonabarabran. Further investigation into taste issues needed. 30/7/21: algae torch purchased in FY20/21, operation to be implemented and recording to be added to spreadsheet prior to spring; BGA charts still to displayed at BWY/MDN WTPs; A292 still outstanding, however carbon implemented for taste & odour in CBN	Add testing of sedimentation lagoons in warmer months (from December) as per BGA tests in raw water quality monitoring program. To be included in operational monitoring plan. Operators to re-familiarise themselves with BGA Management Protocols and related response actions. Further investigation needed for taste and odour issues	
122	CBN, BDN	Reservoirs	Monitoring	Consider implementing sampling regime for CBN, BDN for chlorine residual in the reservoirs	4.2	Operational Monitoring	Risk assessment	9.02	Mar-2015	Medium	Technical Officer	30-Jul-21	30-Jun-21		Implemented				Coonabarabran now (August 2019) recording chlorine residual testing of reservoirs (recorded weekly). 27/9/19: BDN flushing sheet not yet printed (waiting on sheets from Dunedoo) 24/4/20: BDN flushing sheets still to be printed 25/3/21: chlorine recorded as part of weekly reservoir inspections; slot to be added on Ops carbon copy books to record chlorine residual 30/7/21: updated carbon book still outstanding for BDN (meanwhile weekly recordings on comments section of ops log sheet)	Baradine monitoring flushing sheet to be amended to include chlorine residual monitoring of reservoirs.	
123	Coonabarabran	Filtration	Minor works	Install a second turbidity meter on the outlet of filter 2.	4.2	Operational Monitoring	CWT report May-15		May-2015	Very High	Supervisor North	27-Jun-19			Closed	2016-10: (Section 4.2.4, p.12 of CWT report) 2018-05: part of S&S funding project 'Automation and Process Instrumentation' - EOI submitted 04/2018	check individual filters periodically - once a week? (AM) may need to install sampling points; put in comments on sheet		Closed, covered by action 130		
124	Coonabarabran	Whole of System	Investigations	Consider online monitoring where CCPs have been identified	4.2	Operational Monitoring	Risk assessment	11.01	Mar-2015	Medium	Manager Warrumbungle Water	28-Feb-20			Closed				Closed, covered by Action 258 and 328.	To be included as part of process monitoring, automation and instrumentation project (action 328)	
125	Coonabarabran	Filtration	Minor works	Commission the turbidity meter to allow online monitoring of the filters.	4.2	Operational Monitoring	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor Treatment	24-Jul-20	30-Jun-20		Complete				Part of WTP upgrades 27/9/19: received HH2O quote, need to revise; need PLC replacement (quote R&D) 13/12/19: Have once quote, expecting more quotes in early 2020. HunterH20 to install individual filter analyser (only currently on one filter) 28/2/20: Dual turbidity meters to be installed and replacement of PLC. PLC has been ordered. 24/4/20: Proposal received from HunterH20 for filter upgrade 24/7/20: covered under item 328; will be completed on 26/7/20	Waiting on project timeline for PLC. Liaise with HunterH20 on turbidity analyser.	
126	Coonabarabran	Disinfection	Critical control point	Install continuous online chlorine meter to ensure continual effective disinfection/control of chlorination CCP.	4.2	Operational Monitoring	Bligh Tanner report Feb-16		Feb-2016	Medium	Supervisor North	28-Feb-20	31-Jan-20	interim	Complete				Chlorine analyser has been installed, not yet online. Refer to action 258 and 328. Part of WTP upgrades 27/9/19: received HH2O quote, need to revise; need PLC replacement (quote R&D) 13/12/19: Have one quote, expecting more quotes in early 2020. unterH20 to install individual filter analyser (only currently on one filter) Closed, as part of automation project (action 328)	To be included as part of process monitoring, automation and instrumentation project (action 328)	
127	Baradine	Filtration	Minor works	Install online turbidity meters for filtration (AND sedimentation after/during clarifier upgrade).	4.2	Operational Monitoring	Bligh Tanner report Feb-16		Feb-2016	Medium	Supervisor Treatment	24-Apr-20	30-Aug-20		Closed		2018-05: Safe and Secure EOI submitted for 'Automation and Process Instrumentation'. 2019-05: Automation Upgrade scoping study funding granted		Location changed to BDN Covered part of automation project (scoping study). 24/4/20: Recent meeting on upgrade project with DPIE, no current resolution. Spare online analyser being considered for use at Baradine at Binnaway. Supervisor to look at online analyser. Hunter H20 are currently doing an automation scoping study that should identify sites where analysers are required. 24/7/20: closed as included in new action A350	To be included as part clarifier upgrade or treatment plant upgrade	

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
128	Coonabarabran	Filtration	Minor works	Install online turbidity meters for each filter.	4.2	Operational Monitoring	Bligh Tanner report Feb-16		Feb-2016	Medium	Supervisor North	27-Sep-19	31-Dec-19		Closed		2018-05: Safe and Secure EOI submitted for 'Automation and Process Instrumentation'. 2019-05: Automation Upgrade scoping study funding granted		Combined inline online analyser; refer to ID 130	Consider part of automation project (scoping study) or plant of treatment plant upgrade	
129	Mendooran	Disinfection	Minor works	That online turbidity and chlorine residual monitoring is installed at Mendooran WTP.	4.2	Operational Monitoring	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Supervisor South	22-Jan-19			Implemented		Safe & Secure - draft funding deed is in preparation				
130	Coonabarabran	Filtration	Minor works	Install a second turbidity meter on the outlet of filter 2 and reconfigure the existing turbidity meter to monitor filter 1.	4.2	Operational Monitoring	CWT report May-15		May-2015	Very high	Supervisor Treatment	24-Nov-20	6-Mar-20	interim	Complete	2016-10: (Section 4.2.4, p.13 of CWT report) 2018-05: part of S&S funding application (Incident Review recommendation #)	currently monitoring both filters daily		Covered under automation project (action 328) Part of WTP upgrades 27/9/19: received HH2O quote, need to revise; need PLC replacement (quote R&D) 13/12/19: Have once quote, expecting more quotes in early 2020. HunterH20 to install individual filter analyser (only currently on one filter) 28/2/20: Dual turbidity meters to be installed and replacement of PLC. PLC has been ordered. Closed, as part of automation project (action 328)	To be included as treatment plant upgrades. Waiting on project timeline for PLC. Liaise with HunterH20 on turbidity analyser.	
131	All	Information Systems	Documentation / Protocol	Develop operating procedures for the following tasks: · Laboratory water quality sampling and testing · Scheduled maintenance tasks · Daily rounds · Plant operations	4.2	Operational Monitoring	Hunter H2O Audit 2014	BAR002, BIN002, BUG001, COH003, COO003, DUN003, KEN001, MEN002	2014	High	Manager Warrumbungle Water	28-Feb-20	31-Dec-19		Closed	No current standard operating procedures exist. General operating procedures are being developed in unison with the alliance			Hunter H20 is developing 12 SOPs (NSW Health support project) 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/2/20:Closed as covered by new action 339	To be included as part of action 339 develop SOPs system wide Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOP/SWMS	
132	Mendooran	Sedimentation Lagoons	Minor works	Desludge off line lagoon	4.3	Corrective Action	DPI Inspections	DPI MEN007	Jan-2019	Medium	Supervisor South	27-Aug-19			Complete		The off line lagoon has dried out and is ready for desludging. Council is encouraged to carry out the desludging as soon as possible. If Council delays this work the risk is wet weather may further delay desludging which potentially could lead to the on line lagoon reaching full sludge capacity prior to the off line lagoon being ready.		Lagoon was desludged		
133	Mendooran	Vegetation Control	Operations	Maintain vegetation control throughout the water plant grounds and particularly around the sedimentation lagoons.	4.3	Corrective Action	DPI Inspections	DPI MEN008	Jan-2019	Medium	Supervisor South	27-Aug-19			Implemented		Cumbungi particularly should be kept out of the lagoons by physical rer		Vegetation is mowed, weeds pulled. Lagoon weeds removed with excavator when desludge		
134	Binnaway	Sedimentation Ponds	Major works	Reline complete pond to effectively seal the pond to allow effective drying/desludging of the pond. Council is reminded to keep pond cycling times to twelve months to prevent excessive sludge build up which can lead to difficulty in effective drying of sludge. Staff report that ponds have been cycled at twelve month intervals.	4.3	Corrective Action	DPI Inspections	DPI BIN001	Jan-2019	High	Supervisor South	22-Jan-19			Closed		Pond No:1 (West) is currently offline and has been desludged. Staff report that a clay impregnated liner was used on the eastern side only of the lagoon. The excavator operator was unable to completely clean out sludge from the bottom of the lagoon due to water ingress lifting the liner		Closed covered by action 330		
135	Mendooran	Reservoirs	Investigations	That WSC investigates the operational control arrangements with a view to including the Standpipe reservoir level as part of the start/stop control of the clear water pumps, so that either the Coolabah reservoirs or Standpipe reservoirs can start/stop the clear water pumps.	4.3	Corrective Action	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Supervisor South	22-Jan-19			Complete						
136	Mendooran	Reservoirs	Documentation / Protocol	That WSC review all reservoir inspection reports (2014 and 2017) to develop an Action Plan and urgently implement any outstanding recommendations. This Action Plan information should also be regularly reported back to DPI-Water.	4.3	Corrective Action	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water; Supervisor Treatment	24-Nov-20	31-Aug-20	interim	Closed		Obtaining quotes and confirming contractor		Reservoir upgrades undertaken in May 2019 for integrity. WHS and Internal works still to be undertaken. Captured in annual report in DPIW Circular 18 (Contractor engaged) and in ASAM. 13 December 19: Not yet submitted. 6 reservoirs still to be inspected, difficulties in getting Aqualift to undertake inspection. To get WEARS to undertaken inspections/cleans for remaining reservoirs. 28/2/20: Contractor has been engaged to fix remaining 6 reservoirs (WEARS). Circular 18 report has been submitted. 24/7/20: received excel sheet from WEARS incl source reports and priorities (excl 2014 ASAM); for MDN CWT compiled a list incl. 2014 ASAM reports but no prioritisation --> WEARS to provide cost to provide complet list (incl. 2014 ASAM/corroded internal structures) 24/11/20: finalisation of implementation still required --> included in Action 352 (A136 closed now)	Liaise with WEARS to provide quote on updated list.	
137	Mendooran		Documentation / Protocol	That WSC review the LMWUA Water Treatment Plant Audit Report for the Mendooran WTP (September 2014), develop an Action Plan and urgently implement any outstanding recommendations. This Action Plan information should also be regularly reported back to DPI-Water.	4.3	Corrective Action	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented		6 of 15 completed, 8 in progress, 1 outstanding. All to be included in DWMS Improvement Plan				
138	Coonabarabran		Documentation / Protocol	Establish a rapid communication system to deal with unexpected events.	4.3	Corrective Action			Mar-2015	High	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				Draft ERP Hunter H20 developing updated incident response plan (NSW Health project) 20/2/20 - Closed and included as part of new action 341	To be included as part of ERP update (action 341)	
139	Coonabarabran		Training	Train relevant staff in these procedures (rapid communication incident response) and maintain a record of training. (A139)	4.3	Corrective Action			Mar-2015	High	Manager Warrumbungle Water	24-Jul-20		Within 2 months of finalisation	Closed				Training once new plans are developed 13/12/19: Confirmed that development of ERP is to be undertaken as part of Hunter H20 NSW Health project. 20/2/20- Training to be developed following development of ERP (Action 341) 24/7/20: closed as included in action A341	As part of HH2O IRP project (see action 341)	
140	BUG, DDO, KBI	Environmental	Minor works	Install an appropriate containment bund around the dosing tank to capture any chemical leaks or spills during pump operation or transfer of hypo	4.3	Corrective Action	Hunter H2O Audit 2014	BUG006, DDO009, KBI006	2014	Medium	Supervisor Treatment	30-Jul-21	31-08-21 28-02-22	KBI DDO dending on CLH chloine room upgrade	In progress		There is no chemical bund in the chlorine dosing/bore room. Chemical leaks and spills will not be contained and increases the risk of release to the environment.		Dunedoo - 19/20 FY chlorine upgrade to gas 27/9/19: BUG/KBI: 200L mix tanks (diluted 20:1, 10:1 in summer with 20L 13% drums) 24/4/20: DDO moving to chlorine gas. 30/7/21: not enough room in BUG to fit bund tank (shed could be replaced with a bigger one or extended); DDO will be upgraded with currently existing equipment from Coolah once the chlorine room has been replaced (A?); KBI to purchase bund tank to install under dosing tank	Purchase bunding for tanks (BUG, KEN)	
141	Coonabarabran	PAC dosing	Minor works	Replace the dosing lines and check the operation of the unit. Cover or store the unit in an area that reduces the chance of damage and systematically test its operation to ensure it remains functional.	4.3	Corrective Action	Hunter H2O Audit 2014	COO011	2014	Medium	Supervisor North	27-Aug-19			Complete		The current portable dosing skid is outside and the condition is deteriorating. The unit will require some refurbishment work before it can be used		Has been recently moved closer to the wall. Currently in use (for algae in the lagoon) for taste and odour.		
142	Coonabarabran	Filtration	Investigations	· Determine the filter media height and compare against the design levels · Sample the filter media and test for sludge content · Continue to monitor filter media height to determine if there is any filter media loss · Perform a sludge content analysis of the filter media. · Investigate the condition of the air scour and filter underdrain pipework to determine the root cause of the issue · Top-up the filter media to the original design media level.	4.3	Corrective Action	Hunter H2O Audit 2014	BAR006 COO007	2014	Medium	Supervisor North	30-Jul-19			Closed		Filter media levels are currently unknown and media loss is apparent inside the filter		Complete as part of filter inspection. Filter media to be replaced by end of FY. Closed as covered by other action (77 and 150)		
143	Coonabarabran	Sludge handling	Investigations	Have sludge tested prior to disposal to ensure it complies with legal requirements for disposal (waste classification guideline). The sludge should be tested for metals, organics, pH and moisture content	4.3	Corrective Action	Hunter H2O Audit 2014	BAR007, BIN007, COO008	2014	High	Technical Officer	30-Jul-19	30/09/2019		Closed	Sludge is excavated from the sedimentation ponds and disposed of at the local tip as required. No testing of the sludge samples currently occurs			Investigated biosolids requirements and do not take samples prior to disposing to landfill		
144	Mendooran	Sludge handling	Investigations	Sample and test the sludge prior to removing from the lagoon to ensure it is appropriate to apply/dispose on site. The sludge should be tested for metals, organics, pH and moisture content	4.3	Corrective Action	Hunter H2O Audit 2014	MEN008	2014	High	Supervisor South	27-Jun-19			Closed				sludge disposed of off-site		
145	CBN		Documentation / Protocol	Continue developing the existing asset registers to develop an electronic database that includes details such as; age of infrastructure; expected life; last service date; maintenance frequency; manufacturer; recorded failures; responsibility for maintenance; operational procedures; and records for maintenance of equipment (including calibration). This should include any monitoring instrumentation.	4.4	Equipment Capability & Maintenance			Sep-2016	Low	Manager Warrumbungle Water	30-Jul-21	TBD		In progress				5 yearly evaluation of asset evaluations (last FY16/17) 24/4/20: Asset register is updated annually following completed capital projects. 24/11/20: Warrumbungle Water has no AMPs and currenty no steps are taken for those to be developed, this however has been a recommendation fo the S430 OLG investigation report 30/7/21: as above; it has	Asset management plan & registers to be developed.	
146	CBN	Filtration	Investigations	Review current filter bed depth against design depth and consider increasing media layers for better size to depth ratio.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Low	Supervisor Treatment	24-Mar-21	28-Feb-21		Complete		(Section 4.2.4, p.13)		Filter inspection undertaken. 24/4/20: Quote received from Hunter H20 for filter media replacement 24/11/20: media replacement schedule for Feb 2021 25/3/21: specs for media replacement incl. filter media changes complete; media replacement will be undertaken this FY	To be included as part of filter media replacement	
147	Mendooran	Disinfection	Investigations	Consider insulating the chemical storage shed to lesson chlorine degradation.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Low	Project Engineer	24-Apr-20	30-Sep-20	Interim (finish concept design)	Closed	(Section 4.2.5, p.16)			24/4/20 To be upgraded to gas Action closed, as now covered into new combined Action 345		

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
148	Coonabarabran	Organics Removal (catchment)	Investigations	Consider planting vegetation in/around Timor Dam to absorb organic contaminants used by algae for growth.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Low		27-Aug-19			Closed		(Section 4.1, p.6)		Vegetation surrounding dam currently. Mixer installed.		
149	Coonabarabran	Fluoridation	Investigations	Analyse scale forming in fluoride system and on dosing spear.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Low	Manager Warrumbungle Water	24-Apr-20	31-Dec-19		Closed		(Section 4.2.6, p.16)		24/4/20: Closed, included under Action 346	Close ADD fluoridation	
150	Coonabarabran	Filtration	Investigations	Optimise filtration by investigating BW flow rate and BW water quality.	4.4	Equipment Capability & Maintenance	Bligh Tanner report Feb-16		Feb-2016	Very high	Supervisor North	13-Dec-19	31-Jan-20	Interim	Closed	2016-10: Filter performance is poor, carry-over of filter media, BW rate likely to be too high + BW duration may be too long; 2018-05: optimisation of manual backwash was performed by staff. Filter media replacement scheduled starting 25/06/18. Safe and Secure EOI for 'Automation and Process Instrumentation' submitted.			Filter inspection has been undertaken (FY18/19). Media replacement scheduled for FY19/20. Also refer to ID 91 13 December 2013: Issue with bypass was identified and rectified which has improved BW flow rates. To confer with HunterH20 if filter replacement is still necessary. 28/2/20 - Action now closed, covered under action 77		
151	Mendooran	Distribution	Major works	Replace service water pumps Install appropriate back flow prevention vales Run a service water line across to the laboratory to test treated water	4.4	Equipment Capability and Maintenance	DPI Inspections	DPI MEN003	Jan-2019	Medium	Supervisor South	27-Aug-19			Closed		The service water system at the water plant has not been functioning correctly since construction. The service water pumps need to be replaced with correctly sized pumps to supply water to the chemical dosing boards and safety showers. Operators have noted previously an incident where sodium hypochlorite has backflowed into the eyewash/safety showers. More recently coagulant was able to bypass a check valve into the service water line and make its way into the reticulation system (via the clear water tank). This was evidenced by coagulant sediment found in the standpipe reservoir when it was drained down (notably some months after the contamination incident was identified). Given the public health and WHS issues associated with these events, high priority should be given to ensuring appropriate back flow prevention valves are installed in the appropriate locations to prevent reoccurrence. Scheduled maintenance should cover these valves. Council may also consider running a service		Alternative arrangements have been undertaken to address the reasons for the requirement		
152	Mendooran	Reservoirs	Major works	A recirculation/rechlorination system should be considered to maintain a set concentration of free chlorine throughout the reservoirs. Vermin/bird proofing to be made permanent, access covers bought up to standard, overflow pipes made vermin proof Clean up of the site to remove cut vegetation is required as well as trimming back overhanging trees if needed. (A152)	4.4	Equipment Capability and Maintenance	DPI Inspections	DPI MEN004	Jan-2019	High	Supervisor Treatment; Project Engineer; Manager Warrumbungle Water	24-Nov-20	31-Oct-19	Interim deadline (engage consultant for concept design)	Complete		Vermin/bird proofing needs to be made permanent, foam fill is a temporary measure that has already been compromised leaving the reservoir susceptible. Access covers should be brought to standard by ensuring they are sealed to the roof to prevent stormwater ingress, have a 100mm riser and a lockable lid. Overflow pipes should be vermin proofed. The rechlorination system on site was turned off on the day of inspection and is only rechlorinating delivery flows to the reticulation system.		Vermin/bird proofing - complete (May 2019) Site has been cleaned up and overhanging trees have been trimmed. 27/9/19: tender accepted as per Sept Council meeting, letter of offer prepared: future funding for D&C doubtful 13/12/19 Consultant engaged to undertake concept design (site visit has already been undertaken - Nov 2019) 20/2/20: To report to Council on choice of contractor 24/7/20: closed as included in ation A345	Recirculation to be covered by Mendooran Plant upgrade project (currently out for tender) Interim - report to Council on choice of contractor Find funding following concept design finalisation (liaise with DPIE)	
153	Mendooran	Reservoirs	Major works	Consider replacing the roof with a platform roof. This would have several advantages, the whole roof becomes the access platform with surrounding handrail (removing some of the roof inspection concerns i.e. working at heights on a pitched roof), Access hatches installed to standard and remove pitched roof. Council should indicate how they intend to meet Circular 18 (issued by DOI Water) requirements for reservoir maintenance and inspections. Council should consider either a recirculation/rechlorination system to maintain the chlorine level at a set point in this reservoir or install a mixer to destratify the reservoir. It is understood Council is considering pressure booster pumps to address previously noted water pressure issues from this reservoir.	4.4	Equipment Capability and Maintenance	DPI Inspections	DPI MEN005	Jan-2019	High	Supervisor South; Manager Warrumbungle Water	28-Feb-20	28-Feb-20	submit C18 report	Complete		An attempt has been made to seal the hatch lid on the stand pipe reservoir but the reservoir has not been sealed to prevent stormwater ingress. In it's current form it would be very difficult to seal effectively due to the way the roof and platform have been constructed. As recommended previously, Council should consider replacing the roof with a platform		Circular 18 (Contractor engaged to develop. Hatches have been replaced. Tender to be prepared to undertake external concrete repairs. 28/2/20: Circular 18 submitted January 2020. Closed, refer to other action 152 for consideration of recirculation/rechlorination system	Recirculation to be covered by Mendooran Plant upgrade project (currently out for tender) Interim - report to Council on choice of contractor; refer to ID 152	
154	Bin	Laboratory	Major works	Consider a transportable building to provide adequate laboratory space with storage cupboards and lab sinks to facilitate daily testing. This would be an opportunity to include updated staff amenities in the new building such as toilet, shower, and lunch room as well as provide a space for administration/record keeping i.e. desk and computer with internet access. Given the current water quality issues of iron and manganese it is recommended that Council provide test equipment in the laboratory that is capable of testing for those parameters. A spectrophotometer should be considered due to the wide range of parameters that can be tested.	4.4	Equipment Capability and Maintenance	DPI Inspections	DPI BIN002	Jan-2019	Low	Supervisor South	27-Aug-19			Closed		The current laboratory space is inadequate for housing the necessary laboratory equipment to carry out the required daily testing regime.		Required daily testing is being carried out. Additional building not considered necessary at this stage.		
155	Binnaway	Distribution	Minor works	Repair/replace high lift pump	4.4	Equipment Capability and Maintenance	DPI Inspections	DPI BIN003	Jan-2019	High	Supervisor South	27-Aug-19			Complete		One high lift pump is currently out of service. This should be repaired/replaced as soon as is practicable to avoid total plant failure in the event of the second high lift pump failing.		Pump has been replaced (August 2019)		
156	Binnaway	Filtration	Minor works	Replace filter outlet valve	4.4	Equipment Capability and Maintenance	DPI Inspections	DPI BIN004	Jan-2019	High	Supervisor South	27-Aug-19			Closed		The filter outlet valve has not been effectively shutting off and the replacement valve has been on site for some time. This valve should be replaced as soon as practicable.		Closed as covered by action 327		
157	Coonabarabran	Filtration	Investigations	Consider need to replace filter media.	4.4	Equipment Capability & Maintenance	Bligh Tanner report Feb-16		Feb-2016	Medium		25-Jun-18			Complete		2016-10: Underdrains may also need refurbishment 2018-05: Replacement scheduled to start 25/06/18. 2019-05: replacement completed as scheduled (06/2018)				
158	Binnaway	Sedimentation Lagoons	Operations	Ensure the desludging of the sedimentation lagoons and any necessary maintenance is carried out at the earliest opportunity to ensure the offline lagoon is available for service when required.	4.4	Equipment Capability and Maintenance	DPI Inspections	DPI BIN007	Jan-2019	High	Supervisor South	27-Aug-19			Complete		The offline sedimentation lagoon has recently been brought online. Staff have indicated that the lagoon currently offline will now be pumped out to allow the lagoon to dry for sludge removal and maintenance.		Desludging has been completed, undertaken on an annual basis.		
159	Check location - BUG, KEN, DUN	Disinfection	Minor works	Install duty/standby chlorine dosing pumps.	4.4	Equipment Capability & Maintenance	Bligh Tanner report Feb-16		Feb-2016	Medium	Supervisor North; Supervisor South	27-Aug-19			Closed	2018-05: Note - spare pumps are available			Spare pumps considered adequate for sites, duty/stand by not considered necessary due to site size and intended upgrades (DUN).		
160	Mendooran		Investigations	That WSC liaises with DPI-Water to prepare a program of capital works required to address current water treatment plant and water supply issues identified in this report, with the aim of obtaining funding under the "Safe & Secure Water Program" to complete these works.	4.4	Equipment Capability and Maintenance	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Complete						

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
161	Coonabarabran	Fluoridation	Investigations	Discuss fluoridation issues with PHU/DPI Water.	4.4	Equipment Capability & Maintenance	Bligh Tanner report Feb-16		Feb-2016	Very high		29-Aug-18			Complete	2016-10: Unknown solid in saturator of significant volume; dosing pump turned up to 100% to try and maintain final concentration (still underdosing); resolved by adding new fluoride to saturator (unknown substance still present) --> analyse solid to determine if it originates from a reaction with the source water. 2018-05: Removal of solid and replacement of saturator scheduled.	communicated to public that we are not dosing fluoride wait to hear back from NSW Health Water Unit following email from 24/08				
162	Mendooran	Coagulation & Flocculation	Operations	Remove algae from flocculator chamber and aerator surface.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Medium	Manager Warrumbungle Water; Supervisor Treatment	24-Apr-20	31-Mar-20	confirm with HH2O	Complete		(Section 4.2.2, p.10), remove by skimming and application of NaOCl liquid when required to prevent release of toxins		Cleaned on an annual basis (lagoon changeover) 13/12/19: Confirmed that maintenance schedules is to be undertaken as part of Hunter H20 NSW Health project (Task 4) 24/4/20: Included as a maintenance item		
163	Coonabarabran	Organics Removal (catchment)	Investigations	Check mixing profile of the WEARS mixer in Timor Dam.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Medium		30-Jul-19			Closed		(Section 4.1, p.6)		No longer required, mixer is working fine (previously upgraded)		
164	Coonabarabran	Organics Removal	Major works	Upgrade existing PAC system with a new automated batching and dosing system.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Medium	Supervisor North	27-Sep-19	30-Apr-20		Closed		(Section 4.2.1.1, p.8)		27/9/19: not required, dosing is adequate (batching); replaced pump recently	Investigate the need for upgrading the PAC dosing system, as part of treatment plant upgrade project.	
165	Coonabarabran	Disinfection	Minor works	Install scales for chlorine gas cylinders and connect to SCADA.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Medium	Supervisor Treatment	24-Apr-20	31-Mar-20		Complete		(Section 4.2.5, p.15)		Scales are installed, not connected to SCADA 24/4/20: Marked as complete, scale installed. Connection to SCADA included as part of action 328)		
166	Coonabarabran	Fluoridation	Operations	Check service water for fluoride system is within required quality limits and softener in working effectively.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Medium	Manager Warrumbungle Water	24-Apr-20	30-Jun-20		Closed		(Section 4.2.6, p.16)		24/4/20: Within HunterH20 project. Project is progressing. Closed, included under Action 346. Change to LOW	To be included as part of task 4 Hunter H2O NSW Health project	
167	Coonabarabran	Fluoridation	Minor works	Modify fluoride saturator outlet pipework.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Medium	Manager Warrumbungle Water	24-Apr-20	30-Jun-20		Closed		(Section 4.2.6, p.16)		24/4/20: Within HunterH20 project. Project is progressing. Closed, included under Action 346. Change to LOW	To be included as part of task 4 Hunter H2O NSW Health project	
168	BAR, BIN, CBN, MDN	Filtration	Operations	Consider maintenance program for the filters	4.4	Equipment Capability & Maintenance	Risk assessment	5.01	Mar-2015	Medium	Manager Warrumbungle Water	24-Apr-20	31-Mar-20	confirm with HH2O	Closed				13/12/19: Confirmed that maintenance schedules is to be undertaken as part of Hunter H20 NSW Health project (Task 4) 24/4/20: Within HunterH20 project. Will follow fluoridation project. Action closed and includes as part of action 340	To be included as part of task 4 Hunter H2O NSW Health project	
169	BAR, BIN, CBN, MDN	Filtration	Investigations	Consider online turbidity meter with interlocks at BWY, BDN Consider interlocks for meters at CBN and MDN	4.4	Equipment Capability & Maintenance	Risk assessment	5.01	Mar-2015	Medium	Manager Warrumbungle Water	28-Feb-20			Closed				Closed, as part of automation project (action 328)	To be included as part of process monitoring, automation and instrumentation project (action 328)	
170	All	Disinfection	Operations	Consider program of analyser calibration	4.4	Equipment Capability & Maintenance	Risk assessment	7.01	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Closed				Closed, covered by action 191		
171	Mendooran	Disinfection	Investigations	Investigate installation of chlorine mixer for batching or replacement with chlorine gas	4.4	Equipment Capability & Maintenance	Risk assessment	7.01	Mar-2015	Medium	Supervisor Treatment	24-Apr-20	30-Sep-20	Interim (finish concept design)	Closed				24/4/20 To be upgraded to gas Action closed, as now covered into new combined Action 345	Part of Mendooran upgrade project (A345) Confirm current mixing process.	
172	Mendooran		Documentation / Protocol	That WSC investigate and implement a formalised preventative maintenance program for all the WTP, reticulation and reservoir assets.	4.4	Equipment Capability and Maintenance	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Manager Warrumbungle Water; Supervisor North; Supervisor South	24-Apr-20		Following H2O project to develop schedules	Closed			NSW Health has advised their intention to engage a consultant to develop a WTP Maintenance Schedule.		Maintenance schedules to be developed for WTP by Hunter H2O (NSW Health project). 24/4/20: HunterH20 project only looking at treatment. Action closed and includes as part of action 340	Preventative maintenance program to be formalised for reticulation and reservoir.	
173	Binnaway	Fluoridation	Minor works	Arrange for cleaning of fluoride saturator (considering hazardous nature of material).	4.4	Equipment Capability & Maintenance	Bligh Tanner report Feb-16		Feb-2016	Very high	Manager	24-Apr-20	31-Mar-20	wait for HH2O	Closed	2018-05: Being arranged for by LMWUA			Covered by action 332 (NSW Health project) 13/12/19: HunterH2O project (Task 4a) 80% complete, waiting for approval from DPIE to complete works 28/2/20: Internal meeting today with Health on design. Scheduled a workshop in March to present design 24/4/20: Action closed and included as part of action 346	To be included as part of action 332 (replace fluoridation systems) ADD and close	
174	BAR, CBN, MDN	Reservoirs	Investigations	Consider investigating the status of other reservoirs (MDN, BDN, CBN)	4.4	Equipment Capability & Maintenance	Risk assessment	9.02	Mar-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Closed				Closed as covered by actions action 63, 66, 136		
175	All	Distribution	Major works	Replace old water meters with new water meters including backflow prevention devices	4.4	Equipment Capability & Maintenance	Risk assessment	10.01	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented				Program of replacement of water meters in place (1/3 to be completed FY19/20)		
176	Baradine	Clarification	Major works	Replace the clarifier.	4.4	Equipment Capability & Maintenance	Bligh Tanner report Feb-16		Feb-2016	Medium		27-Aug-19			Closed		2018-05: Safe and Secure EOI approved for 'Baradine WTP Upgrade'. 2019-05: SSWP funding granted		Approval for funding for clarifier. Waiting for s60 endorsement and funding endorsement by DoI Water. Closed, covered by action 192		
177	Mendooran	Reservoirs	Minor works	That WSC investigates the installation of an inline booster pumping station on the outlet of the Standpipe reservoir to provide sufficient water pressure for a regular watermain flushing program to be implemented, to improve the water supply system's firefighting capacity and reduce overall water age by only storing water volumes sufficient to meet peak day demands.	4.4	Equipment Capability and Maintenance	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Supervisor South	22-Jan-19			Implemented			Included in S&S funding (R1)				
178	Mendooran	Manganese removal	Minor works	Re-configure potassium permanganate dosing arrangement to allow 5 min contact with raw water prior to addition of PACl.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Very High	Manager Warrumbungle Water	24-Apr-20	30-Sep-20	Interim (finish concept design)	Closed	2016-10: (Section 4.2.1, p.8/9); currently dosing points not separated, suggestions: move KMnO4 to raw water pumping station OR install 5000L oxidation tank above aerator (cascades) 2018-05: part of S&S funding application (Incident Review recommendation #)			Covered under Mendooran upgrade project. Currently out for tender. First stage is a scoping study (ID 48). Could be covered under the raw water blend tank from left over funding 13/12/19: Consultant engaged to undertake concept design (site visit has already been undertaken - Nov 2019) 28/2/20: Have provided a report. Project manager has been engaged to review the documents. Have engaged with DPIE on funding options. Have not yet been advised if funding has been allocated. Action closed, as now covered into new combined Action 345		
179	Mendooran	Disinfection	Minor works	Provide increased pumping capacity for chlorine dosing for disinfection.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	High	Supervisor South	27-Jun-19			Closed	2016-10: (Section 4.2.5, p.16 of CWT report), dosing system (provide 5 mg/L @ 5%) not designed for diminishing chlorine strength --> pump max rate reached without reaching target dose			No longer an issue (following regular cleaning of pipes)		
180	Coonabarabran	Filtration	Investigations	Inspect the filter media and compare to design details (top up where necessary).	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	High	Supervisor North	27-Jun-19	31-Oct-19		Complete	2016-10: (Section 4.2.4, p.13 of CWT report)			Inspection complete		
181	Coonabarabran	Disinfection	Minor works	Install standby rotameter and eductor for chlorine dosing system.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	High	Supervisor North	27-Jun-19			Complete	2016-10: (Section 4.2.5, p.15 of CWT report)			Chlorine room has been upgraded (April 2019)		
182	Binnaway	Filtration	Investigations	Check filter media depth against design requirements	4.4	Equipment Capability & Maintenance	Risk assessment	5.01	Mar-2015	High	Manager Warrumbungle Water; Supervisor South	27-Jun-19			Complete				Filter inspection undertaken (2017) and filter media replaced (June 2018)		
183	Dunedoo	Reservoirs	Minor works	Bullindah reservoir roof replacement (currently planned)	4.4	Equipment Capability & Maintenance	Risk assessment	9.01	Mar-2015	High	Supervisor South	27-Jun-19			Complete				Replaced late 2015 Entry hatch replaced, sealing works (May 2019)		
184	Mendooran	Reservoirs	Minor works	Coolabah requires vermin proofing	4.4	Equipment Capability & Maintenance	Risk assessment	9.01	Mar-2015	High	Supervisor South	27-Jun-19			Complete				Complete May 2019		
185	Coolah	Reservoirs	Minor works	Wentworth Ave and Martin St Reservoirs requires vermin proofing	4.4	Equipment Capability & Maintenance	Risk assessment	9.01	Mar-2015	High	Supervisor South	30-Jul-19	15-Sep-19	complete 27/9/19	Complete				Martin St has been vermin proofed Wentworth Ave needs investigation (e.g. overflow) 27/9/19: Wentwoth Ave has a flap on O/F (on each tank)		
186	Coolah	Reservoirs	Minor works	Wentworth Ave Reservoir requires sealing	4.4	Equipment Capability & Maintenance	Risk assessment	9.01	Mar-2015	High	Manager Warrumbungle Water	24-Apr-20	30-Jun-20		Complete				28/2/20 - Wentworth Ave has been sealed, one spot still to be fixed (WEARS are coming back to be fixed) 24/4/20; Area has been backfilled.		
187	Baradine	Reservoirs	Minor works	Clear water tank requires vermin proofing	4.4	Equipment Capability & Maintenance	Risk assessment	9.01	Mar-2015	High	Supervisor South	27-Jun-19			Complete				CWT has been sealed		
188	BUG, DUN, MDN	Information Systems	Documentation / Protocol	Develop a list of equipment for the site and obtain operation and maintenance manuals from equipment suppliers. Store manuals on site	4.4	Equipment Capability and Maintenance	Hunter H2O Audit 2014	BUG004, DUN006, MEN004	2014	Medium	Supervisor North; Supervisor South	30-Jul-19			Closed		Equipment operation and maintenance manuals are currently not stored onsite. This can delay equipment repair and troubleshooting times when required.		Closed covered by action 340	To be included as part of action 340 (development of WTP maintenance schedules)	
189	BWY	Filtration	Operations	Ensure DP cells are functional and reading correctly. Modify PLC code to allow filter backwashes to be initiated by either filter run time, filter headloss or filtered water turbidity	4.4	Equipment Capability and Maintenance	Hunter H2O Audit 2014	BWY006	2014	Medium	Supervisor Treatment	30-Jul-21	31-Dec-21		In progress		Filter backwashes are only initiated by the filter run time setpoint regardless of the filter performance		24/4/20: PLC upgrades in budget for next financial year. Can add headloss, this will require metering. 30/7/21: PLC upgraded, however additional programming/harware purchase (DP cells) not yet undertaken	To be included as part of treatment plant upgrade	

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
190	BDN, BWY, BUG, CLH, DDO, KBI	Information Systems	Documentation / Protocol	Identify critical equipment and develop procedures to maintain, repair and replace equipment as necessary	4.4	Equipment Capability and Maintenance	Hunter H2O Audit 2014	BDN003, BWY003, BUG003, CLH005, DDO005, KBI03	2014	Medium	Manager Warrumbungle Water; Supervisor Treatment	30-Jul-21	31-Oct-21		Closed	No current asset maintenance plan exists.			NSW Health project to include operation and maintenance schedules at WTPs. No asset management plan. 13/12/2019: To complete a criticality assessment, North is known (but not formalised) 28/2/20: Director Technical Services and Director Corporate and community Services are responsible for the asset management plan. Not yet looked at water. Current spares are known informally. Priority reduced to medium, as this is a matter of formalising what is known. 24/4/20: Critical spare list in development. All sites have whiteboards, with daily, monthly, yearly maintenance. Are arranging servicing of pumps with contractors 30/7/21: Critial spares list developed (on paper), needs to be recorded digially/formalised within DWMS -> record under Asset Mgt and update when equipment is being serviced (sewer pumps); item added to A340	Identify current spares / replacement equipment at each site (Treatment Supervisor). Clarify asset management plan progress / status (Manager) Confirm timeline for schedules (Manager) Criticality assessment (to identify critical spares) Get quotes to undertake assessment (Manager)	Consultant; Project Management resourced needed
191	BAR, BWY, CLH	Laboratory equipment	Operations	Perform appropriate scheduled maintenance and calibration of lab equipment according to the equipment manufacturer/supplier's recommendations	4.4	Equipment Capability and Maintenance	Hunter H2O Audit 2014	BAR013, COO014, BIN011	2014	High	Supervisor Treatment; Technical officer	24-Jul-20	30/04/2020	To undertake calibrations	Implemented	Minimal or no maintenance is carried out by the operators			Annual maintenance and calibration is being carried of instruments and lab equipment, undertaken by contractors (last done in May - due to be completed) 27/9/19: AM had sent new bores equipment to SS but still need model numbers; SS to liaise with supervisors to that list for quotes can be compiled (excluding equipment that we calibrate ourselves) 13/12/19: Quote has been received, Partial list has been compiled. SS to add remaining locations and check with Supervisors 28/2/20: Internal board set up at CBN of frequency of maintenance and calibrations for operators to undertake and sign off on. To be set up at all sites. Photos to be taken regularly of board to ensure records of compliance. List has been compiled and quotes received. Contractor to be engaged and date scheduled for works 24/7/20: IPAC calibrations completed in March	Take photos (Supervisor) of calibration and maintenance boards and setup folder for photos in InfoXpert, e.g. "instrument and equipment maintenance' under DWMS (Tech Officer) --> will go Jacinta's task list	
192	Baradine	Clarification		The council is in the process of engaging contractors to identify and implement an appropriate repair or upgrade	4.4	Equipment Capability and Maintenance	Hunter H2O Audit 2014	BAR005	2014	High	Manager Warrumbungle Water	24-Jul-20	30/06/2020		Closed	The clarifier is showing signs of deterioration and the wall thickness at various points is low due to corrosion.			Approval for funding for clarifier. Waiting for s60 endorsement and funding endorsement by DoI Water. 13/12/19: Dependent on outcomes of review of need for plant upgrade/replacement 28/2/20: See action 78 & 68 24/7/20: closed as included in new action A350		
193	Mendooran	Manganese removal	Operations	Begin dosing chlorine into the filters, targeting a residual of 0.1 mg/L in the filtered water outlet.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Very High		29-Aug-18			*Closed*	(Section 4.2.4, p.15), multi-barrier approach to removing Mn (aim: keep MnO2 coating in oxidised state on filter media, prevent reduction back to soluble form)	Not required: WTP ops under control with regular jar testing + correct dosing rates; Fe/Mn efficiently removed	check filer inspection report from 2018			
194	CBN	pH correction (pre-coagulation)	Investigations	Investigate the need for raw water softening and possible alternate chemicals for pH correction.	4.5	Materials & Chemicals	CWT report May-15		May-2015	Low	Supervisor Treatment	30-Jul-21	30-Sep-20	interim	Complete	2016-10: (Section 4.2.1.2, p.10 of CWT report)			27/9/19: meanwhile bore water in use, which is very soft; however most dosing problems overcome (maintenance, different pumps); investigate changing to soda ash from lime (lime cheaper but soda ash dissolves in water); changed priority to LOW 24/4/20: Still to be investigated 30/7/21: can be done but greater ops cost with soda ash vs lime + capital to implement; no apparent benefit with equipment being maintenained regularly	Check CWT for action details; get costs for soda ash to compare + investigate cost/requirements for change over	
195	MDN	Disinfection	Operations	Commence regular chlorine batch concentration monitoring.	4.5	Materials & Chemicals	CWT report May-15		May-2015	Very High	Supervisor Treatment	30-Jul-21	30-Sep-21		In progress	(Section 4.2.5, p.16 of CWT report) 2018-05: Operator requires on-site training; Supervisor South; SS do drop tests with Stephen Drew (do each time when dose rate is changed, e.g. when swap river/bore water; min weekly)	should test what we receive + do drop test on pump + check PLC; need updated operational sheet; check PLC code for correct dose rate		Operators are testing when chemicals received. 27/9/19: GR to notify SD + verify that there is room in log book (SS) 13/12/19: Investigating equipment to test batch chlorine 28/2/20: Still to be investigated, procedure to be developed and staff to be trained. Long term to be replaced by gas. 24/7/20: HH2O sent through an easy procedure, however implemenation/operator training outstanding [result will be put in comments section on spreadsheet]; to be done weekly 24/11/20: no progress 23/3/21: further operator training required + to be scheduled 30/7/21: TL Treatment Nth to follow up on/continue operator training	Procedure to be formalised (including space for test to be recorded and frequency); Supervisor to review action plan on a regular basis, at least monthly	
196	All		Documentation / Protocol	Confirm whether Council's supplier contracts include chemical quality compliance.	4.5	Materials & Chemicals			Sep-2015	Medium	Supervisor Treatment	30-Jul-21	30-Jun-20		Complete				13/12/19: Contracts to be investigate 24/4/20: CW has sent request for contract, have not yet had response 30/7/21: delivery docket provides concentration spec of delivered chemical as per purchase order, operator checks on receipt	Contact appropriate person to get a copy of procurement contract	
197	All		Documentation / Protocol	Develop a program to undertake spot checks for chemical quality compliance.	4.5	Materials & Chemicals			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Closed				Not considered to be required due to use of reputable and operator monitoring. Issues investigated as required.		
198	All	Disinfection	Investigations	Consider testing of hypochlorite strength	4.5	Materials & Chemicals	Risk assessment	7.01	Mar-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Closed				Undertaken at Mendooran. Chlorine analyser to be installed, no longer necessary at other sites.		
200	Mendooran	Distribution	Operations	Operators should be filling out the plant record sheets. Where equipment is not working or requires replacement/repair, this should be done as a matter of priority. This includes the following: 1. pH meter, 2. pH buffers, 3. Chlorine test reagents, 4. On line raw water turbidity meter.	5.1	Drinking Water Quality Monitoring	DPI Inspections	DPI MEN010	Jan-2019	High	Supervisor South	27-Aug-19			Implemented		The current level of plant performance recording at the plant is unsatisfactory.		Plant records are now being filled out. Supervisor and Technical Officer review that sheets are completed.		
201	Binnaway	Iron and manganese issues	Operations	Reconfigure the chlorine dosing to allow for the installation of a calibration tube to facilitate the measurement and recording of chlorine dosages. The operator would also need to calculate hypochlorite strength in order to calculate the chlorine dosage.	5.1	Drinking Water Quality Monitoring	DPI Inspections	DPI BIN006	Jan-2019	High	Supervisor South	27-Aug-19			Complete		The iron and manganese treatment was discussed with the staff. Staff were requested to keep this office informed of progress with iron and manganese removal.		Dosing was reconfigured, for iron and manganese issues (early 2019)		
202	Binnaway	Disinfection	Minor works	Install a larger calibration tube to allow for the volumes required over a three minute test (based on current dose rates). It is estimated that a five hundred or thousand millilitre calibration tube would be appropriate. Whilst the current calibration tube allows for a very quick snapshot of dose rates a larger tube would facilitate more accurate setting of dose rates and data recording.	5.1	Drinking Water Quality Monitoring	DPI Inspections	DPI BIN008	Jan-2019	Medium	Supervisor Treatment	24-Nov-20	30-May-20	had no due date	Closed		A drop test was carried out to check the alum dosage. The calibration tube should be sized to allow for three minute drop tests to facilitate accuracy of measurement.		27-9-19: GR to order equipment as required (SS can help if required) 24/4/20: Equipment still to be ordered 24/11/20: covered under (A349)	Equipment to be ordered and installed	
203	Binnaway	Distribution	Minor works	Ensure that staff have the necessary testing equipment available on site to test for aluminium to ensure the process is maintaining aluminium residuals within drinking water guideline levels. W	5.1	Drinking Water Quality Monitoring	DPI Inspections	DPI BIN009	Jan-2019	High	Technical officer	13-Dec-19	4-Oct-19	Interim was 13/09/19	Complete		Water quality testing was carried out in Binnaway with the following results: The pH was noted as being slightly high in the sedimentation lagoon. A pH range of between 6 and 7 is expected with alum dosing. If there is no aluminium carry over from the settlement process then the higher pH is of no concern, however if aluminium carry over is detected this is expected to be remedied by lowering the pH in the sedimentation lagoon. The water samples sent for analysis will be tested for aluminium and Council will be advised of the result.		Equipment has capability to test for aluminium. Reagents not currently available on site. 27/9/19: assess what is required for testing and/or order reagents from HACH next week (check lab test equipment manual) 13/12/19: Reagents have been delivered. Operators to review SOP.	Ensure necessary reagents are available and operators are trained (to SOP)	
204	Mendooran		Operations	A new sampling site be created for the correct monitoring locations in Bandulla street. Sample site 123 (57 Bandulla Street) can then be archived.	5.1	Drinking Water Quality Monitoring	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Supervisor South	22-Jan-19			Complete						
205	All		Documentation / Protocol	That WSC develop and implement a "Drinking Water Quality Monitoring Plan" which formalise staff/role responsibilities, authorities reporting and communication protocols and review existing procedures for sampling and testing. The monitoring plan should be built based on the NSW Health Drinking Monitoring Plan (available on the NSW Health website).	5.1	Drinking Water Quality Monitoring	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	30-Jul-21	TBD		In progress			DWQ Monitoring Plan		13/12/19: Consultant has provided a proposal to develop verification proposal 24/7/20: dependant on 206 25/3/21: as above (can get consultant to do DWQ Monitoring Plan once we have Verifcation Plan)	To follow on from action 206 Engage consultant to develop verification monitoring plan	Consultant
206	All		Documentation / Protocol	Formally document all drinking water quality monitoring protocols and combine into a formal Water Quality Verification Plan. Including (A294): There was discussion around who collects the reticulation samples and analyses them before they are sent to FASS. The Councils Environmental Health Office collects and tests the samples. There have been some issues with samples being collected at the wrong location. It was recommended that Council develop a procedure that includes photos and GPS locations to ensure that samples are always collected at the correct location.	5.1	Drinking Water Quality Monitoring			Mar-2015	High	Environmental Compliance Officer	30-Jul-21	TBD	Interim (new sampling sites)	In progress					Information for plan is in process of being collected. 27/9/19: info needs to go on T-drive; some photos still need to be taken; sample sites require updating (+photos added) + incident flowcharts added 13/12/19: Proposal from consultant to develop verification proposal 28/2/20: No progress 24/7/20: Jacinta Green (consultant) to address - CW needs to engage, meanwhile WQ monitoring protocal to be updated by JG (Tech Officer interim) with AM and Jesse R 25/3/21: Supervisor Treatment/Retic (currently vacant) to liaise with EHO (currently vacant) and NSW Health on new sampling sites (sampling at mains); from it the WQ Verifcation Plan can be developed/finalised by Tech Officer/EHO; refresher on DW sampling for rangers and other Ops staff being arranged	Develop draft Water Quality Verification Plan with site locations (and photos). Investigate changing site numbers in NSW Health database. Engage consultant to develop verification monitoring plan (A205)	
207	BAR, BIN, CBN	Fluoridation	Operations	Confirm process on extracting data from NSW Health Water Quality Database	5.1	Drinking Water Quality Monitoring	Risk assessment	8.01	Mar-2015	High	Technical officer	30-Jul-19			Implemented				Data is downloaded from database and uploaded onto Councils website on a monthly basis by the Technical Officer		
208	Mendooran	WTP	Operations	Perform jar tests to determine optimum coagulant dose rates and mixing configurations. Investigate (by performing jar tests) using separated dosing diffusers for improved efficiency of both coagulation and metal removal	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	MEN006	2014	Medium	Supervisor South	27-Aug-19			Implemented		Poly aluminium chloride and potassium permanganate are both dosed through the same diffuser into the top of the aeration stairway		Currently undertaking jar tests. Draft jar testing SOP has been developed. Jar testing training to be undertaken at Coonabarabran (September 2019)		
209	BAR, BIN, CLH	Information Systems	Operations	Enter data at the plant on a daily basis. This will require a local pc with network connection. Data to be used for the following purposes: · Alarms generated if measured values are outside of required parameters (this includes water quality and chemical stock levels) · Monitor chemical dose rates and usage and compare to plant performance and water quality to identify potential efficiency improvements	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	BAR001, BIN001, COO002	2014	High	Supervisor North; Supervisor South	28-Feb-20			Closed	Daily data sheets are stored electronically at the shire office. Therefore the following is not possible: · Fast and easy access to historical results · Ability to use collected information for efficiency improvements · Automated alarms based on water quality parameters			Data entered electronically. Closed as covered by automation project (action 328).	To be included as part of process monitoring, automation and instrumentation project (action 328)	

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
210	CLH	Information Systems	Operations	Implement routine monitoring of daily and instantaneous chlorine gas usage and plant flow rates. Perform calculations to determine instantaneous and daily chlorine dose rate. Installing scales for the chlorine cylinders to stand on will allow for daily chlorine usage to be measured. --> **complete**	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	CLH004	2014	High	Supervisor Treatment; Technical officer	30-Jul-21	31-Oct-21		In progress	Chlorine gas and treated water instantaneous flow rate measurements are not being recorded when operators are onsite. Measuring and monitoring of instantaneous chlorine dose rate and plant flow can provide confirmation of chlorine dose rate			Scales have been installed. Daily monitoring in reticulation. 28/2/20: Flow is being recorded when operators are onsite (has been for some time). Coolah flow is not variable unless change bore source (diff pump). 24/7/20: to be included in next update of carbon copy books, can be recorded in comments section meanwhile - for this new calculation in spread sheet required 24/11/20: chlorine gas bottle weights meanwhile recorded on daily ops sheets; Ops sheet to be update (+ down the track: carbon copy books) 25/3/21: with currently recorded data, daily usage can be recorded; operators to record instaneous chlorine dose rate on site --> Supervisor to liase with Tech Officer for spreasheet calculations; future carbon copy books have been agreed on; will be easier with telemetry in place 30/7/21: formula for daily usage to be added to Tech Officer ops record sheet; rotameter on site for instantaneous rate - need to set up another colum on carbon copy book	Bottle weights to be recorded on sheet and calculation added. Supervisor and Tech Officer to review and update sheet.	
211	Mendooran	Iron and manganese issues	Operations	Perform jar testing to determine optimum manganese removal dosing configurations	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	MEN009	2014	High	Supervisor South	27-Jun-19			Implemented	The plant experiences high manganese levels			Implemented from December 2017		
212	Binnaway	Online monitoring	Critical control point	Consider implementing online monitoring of critical water quality parameters including · Raw water pH · Raw water turbidity · Filtered water turbidity · Treated chlorine residual	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	BIN010	2014	High	Supervisor South; Project Engineer; Manager Warrumbungle Water	28-Feb-20	30/03/2020	had no due date	Closed	Currently no online monitoring exists of the process. Issues with pH changes during weather events have historically caused operational issues			Funding granted from Safe and Secure for scoping study of automation. Action progressed under action 328 Have received quotes for online monitoring of chlorine; 27/9/10: GR consider online NTU meter (filtered water) for now - check with what CBN is getting 13/12/19: Will need a new PLC to purchase/install online analysers 28/2/20: Teleconference workshop in December 2019 (automation project). Closed as covered under A328.	To be included as part of process monitoring, automation and instrumentation project (action 328) Receive audit report from consultant	
213	Coonabarabran	Process monitoring	Operations	Record and monitor 24-hr chemical usage and plant flow. This data will highlight plant performance and assist in identifying trends and possible dosing issues.	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	COO013	2014	High	Technical Officer	13-Dec-19	31/01/2020		Complete	24 hour chemical usage verse flow calculations are not performed			27/9/19: can be done before 30/09 13/12/19: Calculation still to be added. 28/2/20: Calculation to be added		
214	BUG, KBI	Routine testing	Monitoring	Initiate daily sampling and testing of the town distribution system. Tests should include free chlorine residual, pH and turbidity. This will improve response times to water quality issues. Data collected can also be used for future planning and adjustments to the daily operating set points.	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	BUG005, KBI005	2014	High	Supervisor Treatment, Technical Officer	30-Jul-21	31-Dec-21		In progress	To ensure treated water quality complies with the Australian Drinking Water Guidelines (ADWG), water quality monitoring of the town distribution system must occur. Currently chlorine residual levels are measured weekly			Currently being undertaken 2-3/week. Chlorine analysers are installed, to be bought online. 13 December 2013: Analysers have been installed, not yet linked to shut pump down 28/2/20: Analysers to be linked to telemetry at the end of next week and text message alarm sent. 24/7/20: BDN operator going out 3 x week to test water at bore + 1 x week in retic (pH/chlorine; NTU to be added - instrument to be provided & to be recorded on spreadsheet); chlorine analysers set-up to send txt message alarms (interlock with bore pump hence not required) 24/11/20: NTU meter availalbe now (as well as pH meters), Tech Officer to create carbon copy books for BUG/KBI (currently only one space on CBN sheet for chlorine read weekly); bore flow reading will be recorded as well 25/3/21: AM to liase with FS (new Tech Officer) on the proposed new books 30/7/21: once telemtry is up and running, chlorine, pH and temperatru will be online; turbity will be mearbe measured on site once/week (templates done for new carbon copy books) as the small scheme does not justify operator involvement more than that.	Develop new carbon copy book for BUG/KBI each with pH/chlorine/NTU (can be left on site + include flow meter in future) - AM will forward draft to Tech Officer	
215	Dunedoo	Routine testing	Monitoring	Collect water samples from the distribution system and test for: · Free chlorine residual · pH · Turbidity Results may dictate if dosing rate changes are required to be made at the treatment plant.	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	DUN008	2014	High	Technical Officer	13-Dec-19	4/10/2019	was 31/8/19	Complete	Water quality testing of the distribution system is currently not being performed			Daily pH and chlorine recorded daily and entered into spreadsheet weekly Weekly turbidity not yet entered. Some sheets still to be modified to include turbidity. 13/12/19: Spreadsheet has been modified and turbidity is being entered		
216	Coonabarabran	Sedimentation Ponds	Operations	Monitor the sedimentation ponds daily for contamination sources such as dead animals	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	COO012	2014	High	Supervisor North	28-Feb-20	28-Feb-20	Interim	Closed	Due to the sedimentation ponds being in an open area there is a risk of contamination from the wildlife			Daily walk around includes lagoons 13/12/19: Hunter H20 SOPs to be used as template. Supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote f to develop the rest 28/2/20:Closed as covered by new action 339	To be included as part of action 339 develop SOPs system wide	
217	Dunedoo	Water Quality Targets	Operations	Monitor the chlorine residual daily and adjust the dose rate to maintain a consistent residual	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	DUN007	2014	High	Supervisor South	27-Jun-19			Complete	The chlorine dose rate is not regularly adjusted to control the treated water chlorine residual			Daily chlorine recorded daily and entered into spreadsheet weekly		
218	All		Monitoring	Consider providing water quality data in water rate notices to customers	5.3	Short-term evaluation of results			Sep-2016	Low	Manager Warrumbungle Water	27-Aug-19			Closed				Currently provided on Council website.		
219	Mendooran	Distribution	Monitoring	That the onsite sampling and testing conducted by the EHO includes turbidity and these field results are provided to the WTP operators on the same day that FASS samples are collected.	5.3	Short Term Monitoring of Results	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Supervisor South	22-Jan-19			Complete						
220	Mendooran	Distribution	Document ation / Protocol	That WSC update the daily water quality log sheets to include turbidity and temperature, and CCP limits and actions to be taken if the CCP limits are exceeded. This will prompt the WTP operator to take appropriate actions and notifications if results are above the alert or critical limits. That the WTP operators use a simple system, where they colour in the results (using highlighter pens) to identify where the results lie within the CCP ranges.	5.3	Short Term Monitoring of Results	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Supervisor South	22-Jan-19			Complete						
221	BUG, KEN		Document ation / Protocol	Record customer complaints in water quality monitoring spreadsheets for Bugaldie and Kenebri water supply systems.	5.3	Short-term evaluation of results			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Complete				All customers complaints are recorded in a database 'Complaints and Enquiries'.		
222	All	Information Systems	Operations	Implement regime of regular (daily) review of raw and treated water quality results, and input operational data into an electronic spread sheet to facilitate analysis and reporting.	5.3	Short-term evaluation of results			Mar-2015	High	Manager Warrumbungle Water	30-Jul-19			Implemented				Data entered electronically. Daily review of data by operator (manual highlighting of data outside trends) Fortnightly review of CCP data (exceedance summaries), sent to Supervisors and Manager and reviewed in operations meeting. Quarterly DWMS reviews undertaken Monthly report to General Manager of CCP exceedances. Action to formalise schedule covered under action 285.		
223	All		Document ation / Protocol	Establish a rapid communication system (for internal and external communication) to deal with unexpected events. It is recommended this be included in the **Emergency Response Plan** that is addressed below.	5.4	Corrective Action			Sep-2014	Very high	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed	Draft ERP developed by Bligher Tanner in Jan-16; ERP needs to tie in with BCP Get proposals from consultants (need key players); needs to fit in with BCP	BL: Narromine did something similar; NSW Health to follow up re funding?		Finalisation of ERP to be included as part of NSW Health project. Document responsibility to be allocated, including setting review times 13/12/19: Confirmed that development of ERP is to be undertaken as part of Hunter H20 NSW Health project. 28/2/20 - Progress delayed (prioritised filter inspection)	To be included as part of ERP update (action 341)	
224	All		Document ation / Protocol	Consider implementing a procedure in consultation with local hospitals to ensure dialysis patient details remain UpToDate.	6.1	Communication			Jun-2016	Low	Technical Officer	24-Mar-21	31-Mar-19	Interim	Closed				Finalisation of ERP to be included as part of NSW Health project. List of dialysis patient previously investigated. 28/2/20: List developed in liaison with Dubbo Hospital (A229). Process still to be developed 24/04/20: Contact list still to be added as a register in authority 24/7/20: referred to in **action A341**	Refer to action 229 (obtain list of patients) Develop process for distribution and allocate responsibility of keeping document current. Add register to Authority.	
225	All		Document ation / Protocol	Define communication protocols with the involvement of relevant agencies and include in the protocols a contact list of relevant agencies and businesses and their relevant key people.	6.1	Communication			Sep-2015	Medium	Manager Warrumbungle Water	24-Apr-20			Closed				24/4/20: Closed, included as part IERP development under Action 341.		
226	All		Document ation / Protocol	Review and update contact details listed in Table 10.	6.1	Communication			Jun-2015	Medium	Manager Warrumbungle Water	24-Apr-20			Closed				24/4/20: Closed as included under Action 334		
227	All		Document ation / Protocol	Develop a comprehensive public and media communications strategy and include draft public and media notifications.	6.1	Communication			Jun-2015	Medium	Manager Warrumbungle Water; Admin Support	03-Aug-21	TBD		In progress				24/4/20: Carol (Admin support) to arrange the development of a communications strategy (to include restriction advice) 3/8/21: with resignation of Coolah admin officer no admin support available any longer to WW --> will need to outsource to consultant in liaison with Manager Corporate		
228	All		Training	Identify an appropriate person to handle all incident and emergency communications and ensure they are appropriately trained.	6.1	Communication			Jun-2015	Medium	Manager Warrumbungle Water	28-Feb-20	31-Mar-20	Interim (Hunter H2O proposal not yet scoped)	Closed				To included as part of updated incident response plan 13/12/19: Confirmed that development of ERP is to be undertaken as part of Hunter H20 NSW Health project. 20/2/20 - Closed and included as part of new action 341	Ensure that Hunter H20 (NSW Health project) ERP identifies appropriate person to handle incident and emergency communications	
229	All	Distribution	Document ation / Protocol	Obtain list of dialysis patients for each system	6.1	Communication	Risk assessment	10.02	Mar-2015	High	Technical Officer	28-Feb-20	14-Mar-20	Interim was 6/9/19 (get list of patients)	Complete				Finalisation of ERP to be included as part of NSW Health project. List of dialysis patient previously investigated. 13/12/19: Couldn't find existing list. SS is liaising with hospital to develop list 28/2/20: List developed in liaison with Dubbo Hospital.	Develop process for distribution and allocate responsibility of keeping document current. Add register to Authority (A224)	
230	Mendooran		Training	That WSC staff with NSW Health staff undertake regular, at least annually, familiarisation and/or training in the implementation of NSW Health's drinking water quality incident response protocols.	6.2	Incident and Emergency Response Protocols	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Manager Warrumbungle Water; HR	22-Jan-19			Complete						
231	Mendooran		Document ation / Protocol	That WSC implement a simple "Water Quality Monitoring Incident Report" sheet for WTP operators to complete if any field results fall outside of the ranges set out on the field monitoring log sheets.	6.2	Incident and Emergency Response Protocols	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Supervisor South	22-Jan-19			Complete						
232	Mendooran		Document ation / Protocol	That WSC review and finalise the DWMS Implementation Report (2016), so that the recommended "Emergency Response Plan" can be utilised for any future incidents and emergencies. It is recommended that an exercise of the incident response plan be organised with the PHU (mid-2018).	6.2	Incident and Emergency Response Protocols	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed		ERP forms part of Councils DMNW and BCP.		Draft ERP Hunter H20 developing updated incident response plan (NSW Health project) 20/2/20 - Closed and included as part of new action 341 & 342	To be included as part of ERP update (action 341 & 342)	
233	All		Document ation / Protocol	Identify possible water quality related incidents and emergency scenarios (the risk assessment should be used as a basis) and document these potential scenarios in an Incident and Emergency Response Plan. Document procedures and response plans to address these incidents (can refer to guideline protocols from NSW Health as provided in the DWMS). Add to the ERP particular processes that are required to address severe hazard / emergency scenarios, such as algal blooms, fuel spills, bushfire etc. The development of these protocols should involve relevant agencies.	6.2	Incident & Emergency Response Protocols			Mar-2015	High	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				13/12/19: Confirmed that development of ERP is to be undertaken as part of Hunter H20 NSW Health project. 20/2/20 - Closed and included as part of new action 341	To be included as part of ERP update (action 341)	

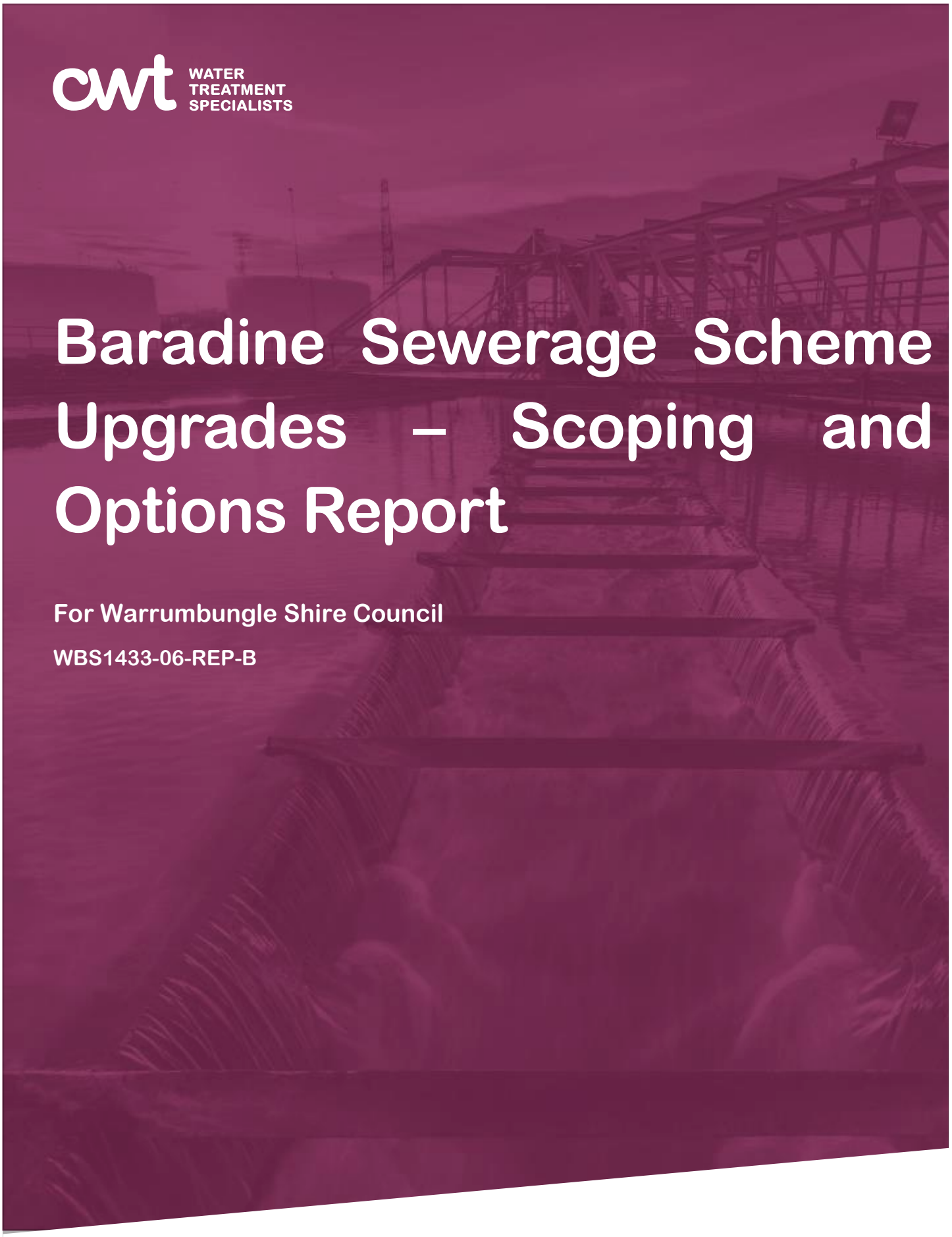
No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
234	All		Documentation / Protocol	Develop a process for investigation following incidents and emergencies and document this process. Include in this process a mechanism for revision of any emergency protocols, where an investigation demonstrates it is required.	6.2	Incident & Emergency Response Protocols			Mar-2015	High	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				13/12/19: Confirmed that development of ERP is to be undertaken as part of Hunter H20 NSW Health project. 20/2/20 - Closed and included as part of new action 341	To be included as part of ERP update (action 341)	
235	All		Documentation / Protocol	Develop a process for documenting and reporting of an incident or emergency.	6.2	Incident & Emergency Response Protocols			Mar-2015	High	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				13/12/19: Confirmed that development of ERP is to be undertaken as part of Hunter H20 NSW Health project. 20/2/20 - Closed and included as part of new action 341	To be included as part of ERP update (action 341)	
236	All		Training	Employees should be trained and protocols regularly tested in the emergency response plans. The requirement for this should be included in the ERP.	6.2	Incident & Emergency Response Protocols			Mar-2015	High	Manager Warrumbungle Water	24-Jul-20	31-Mar-20		Closed				24/7/20: closed as included in action A341	To be included as part of ERP update (action 8)	
237	Mendooran		Documentation / Protocol	That WSC develop and implement procedures for all staff involved in sampling and monitoring which clearly reflect responsibilities in accordance with the DWMS, CCP limits and NSW Health protocols for monitoring water quality incidents. This would include investigations and appropriate remedial actions of any Total Coliform detections and to also follow CCP corrective actions for any free chlorine level exceedances.	7.1	Employee Awareness and Involvement	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Manager Warrumbungle Water	22-Jan-19			Complete						
238	Mendooran		Critical control point	The DWMS CCP summary tables are reviewed, finalised and posted on the noticeboards at the WTP, kept in work vehicles and included in regular training sessions/toolbox talks, incident response protocol/training and included in the water quality monitoring procedures and log sheets.	7.1	Employee Awareness and Involvement	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Supervisor South	22-Jan-19			Complete						
239	Mendooran	Distribution	Operations	That the WSC include WTP operators and other staff involved in water supply activities to attend the Drinking Water Quality Meetings.	7.1	Employee Awareness and Involvement	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Supervisor South	22-Jan-19			Complete						
240	All		Training	All water management stakeholders must read and agree to abide by the principles of this DWMS. This includes adding this requirement to the role descriptions for Council employees moving forward.	7.1	Employee Awareness and Involvement			Jun-2015	Medium	OD	03-Aug-21			In progress				13/12/19: Previous quarterly water quality meeting have discussed importance DWMS. More recently facilitated improvement meetings have been undertaken for Supervisors/Managers. 24/4/20: Some position descriptions include reference to ADWG. Water quality awareness training to be carried out. Proposal received by consultant. 25/3/21: DWMS reference has been added to all PDs as part of re-structure 3/8/21: Final PDs did not appear to have relevant requirement in them - OD to adjust		
241	All		Documentation / Protocol	Consider developing operators communication strategy	7.1	Employee Awareness and Involvement			Jun-2015	Medium	Manager Warrumbungle Water	03-Aug-21	TBD		In progress				24/4/20: Proposal received by consultant. Roadmap to be developed about how information is handed over to operators. E.g. what information requires formal handover and documentation. 3/8/21: formalisation of strategy outstainnd		
242	Mendooran	Staff Training	Training	Ensure staff are adequately trained	7.2	Employee Training	DPI Inspections	DPI MEN001	Jan-2019	High	Manager Warrumbungle Water; HR	13-Dec-19	30/03/2020	Interim	Closed		It is a requirement that water treatment plants be operated by suitably qualified staff i.e. Hold Cert 3 in Water Operations through TAFE or DoI Water operator training. The WTP is not a fully automated plant that requires no supervision. The plant (although some processes are automated) requires regular supervision, monitoring and maintenance by suitably qualified staff who report to the Manager of Water and Sewer.		Second operator from Binnaway is being trained to fill in for Mendooran staff. Structure is being finalised. Operators have Cert 3 in Water Operations. 13/12/19: Currently reviewing competencies and aligning with national certification framework, processes to identify any shortfalls in training 28/02/20: Are progressing the review with NCF. Have determined competency requirement for each plant determined by plant complexity/treatment. Gap analysis and training plan still to be completed. Closed as covered by action 249.	Review training requirements for Mendooran staff following restructure.	
243	MDN		Training	That WSC investigate and implements a process of its WTP operators to be certified under the National Certification Framework.	7.2	Employee Training	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	OD	03-Aug-21	TBD		In progress				Ongoing with HR 13/12/19: Currently reviewing competencies and aligning with national certification framework, processes to identify any shortfalls in training 24/4/20; Review has been undertaken and training plans have been developed. Sign off still to occur. 24/11/20: CK?? covered under other action 3/8/21: update from 04-2021 was 'Sourcing certification training was impacted by Covid in 2020 however Council believes it has not sourced a suitable provided and expects to have the training delivered to staff and have met or be close to meeting its certification target by the end of the 2020-2021 FY		
244	Mendooran	Disinfection	Documentation / Protocol	That the Human Resources records for relevant staff are reviewed, and that training is undertaken for all water supply operational staff, WTP operators and relief staff to upskill and to be appropriately trained in WTP processes (i.e. DPI-Water Part 1 and 2 as a minimum). It is also recommended that all staff involved with water quality sampling, testing and monitoring, undergo training and are involved in developing procedures for their work tasks.	7.2	Employee Training	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Manager Warrumbungle Water; HR	22-Jan-19			Implemented		Referred to HR				
245	All		Training	Formalise internal on-the-job training processes, documenting the training content, processes and attendance.	7.2	Employee Training			Jun-2015	Medium	Manager Warrumbungle Water	24-Nov-20	31-Jul-20		Complete				Process not yet formalised. Informal current process includes on the job training, competency document, annual review against competency document. Consultant has been engaged to provide site induction material (currently scheduled to start mid Dec 19). 24/4/20: Consultant has provided a proposal for induction materials. 24/11/20: documentation created/formalisation completed; implementation required		
246	Mendooran	Reservoirs	Training	Consider working at heights training for staff	7.2	Employee Training	Risk assessment	9.01	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Complete				Training undertaken for water treatment staff (May 2019)		
247	BIN, BAR, MDN	Whole of System	Documentation / Protocol	Review staff structure of water services team, PHU and NOW to provide support	7.2	Employee Training	Risk assessment	11.06	Mar-2015	Medium	Manager Warrumbungle Water	24-Apr-20	20-Jun-20		Implemented				Review on staff structure has been undertaken and revised structure is being implemented. 24/4/20: Restructure in Dec 2020. Issue from 2014 risk assessment on reporting have been rectified, action considered to be implemented.		
248	CBN, BIN, MDN	Organics Removal (catchment)	Training	Operators to re-familiarise themselves with BGA Management Protocols and related response actions.	7.2	Employee Training	CWT report May-15		May-2015	Medium	Supervisor Treatment	24-Apr-20	31-Dec-19		Closed	(Section 4.1, p.6)			Action changed to cover CBN, BWY, MDN systems (from just CBN) 27/9/19: SS printed and laminated (A3) and distributed to CBN, BWY, MDN(?); CW to check with Supervisors if operators have familiarised themselves 13/12/19: Latest BGA has been provided to plants (laminated) 24/4/20: Plants are displayed at CBN & MDN. Closed as covered under action 121	Supervisor to review BGA plan onsite with operators, prior to lagoon sampling.	
249	All	Operator training	Training	Arrange for operators to undertake appropriate training	7.2	Employee Training	Hunter H2O Audit 2014	COH001, DUN001	2014	High	Supervisors/ Manager /HR	24-Nov-20	31/03/2021		Implemented	Operators have not yet completed their fluoridation certification and/or require further training in WTP operations			Confined space and working at heights undertaken 2019. Other training gaps to be reviewed. Manager has requested training schedule from HR. 13/12/2019 Currently reviewing competencies and aligning with national certification framework, processes to identify any shortfalls in training 28/02/20: Are progressing the review with NCF. Have determined competency requirement for each plant determined by plant complexity/treatment. Gap analysis and training plan still to be completed. action 242 closed as considered as covered by this action. 24/7/20: requirements as per NCF included in PDs; fluoridation going to be covered as part of funded NSW Health/HH2O project; HR developed training plan 24/11/20: implemented	Review training requirements for Mendooran staff following restructure (action 242)	
250	All		Documentation / Protocol	Council may consider providing water quality data on residents rates notices and/or publishing some of this data on their website and in Council's Annual Report	8.2	Communication			Sep-2016	Low	Manager Warrumbungle Water	27-Aug-19			Complete				Currently provided on Council website.		
251	All		Documentation / Protocol	Develop a consumer information program providing details on the DWMS, Emergency Response Plan, consumer responsibilities, how drinking water quality may be affected in household distribution and drinking water uses etc.	8.2	Communication			Sep-2015	Medium	Manager Warrumbungle Water	24-Apr-20			Implemented				24/4/20: Four monthly improvement plan update reports are made available on Councils website. General information included on water treatment, including micro, chemical data; water complaint procedure.		
252	All	Performance monitoring	Monitoring	Increase review of water quality performance and utilisation of water quality data to improve understanding of the effectiveness of treatment and to identify water quality trends and patterns.	9.1	Investigative Studies & Research Monitoring			Sep-2016	Low	Manager Warrumbungle Water	27-Aug-19			Implemented				Quarterly DWMS reviews undertaken Fortnightly review of CCP data (exceedance summaries), sent to Supervisors and Manager and reviewed in operations meeting. Monthly report to General Manager of CCP exceedances. Annual review report		
253	All	Catchment & Abstraction	Investigations	Consider instigating a pesticide monitoring program	9.1	Investigative Studies & Research Monitoring	Risk assessment	1.01	Mar-2015	Medium	Technical Officer	13-Dec-19	28-Feb-20	Interim deadline was 13/9/19 (review RWQ assurance program)	Closed				13/12/19: Can confirm pesticides are monitored as part of raw water assurance program Action closed, included as part of new action A347	Review raw water assurance program against this requirement see items 120, 253, 287, 313)	
254	BIN, BUG, CBN, DUN, KEN, MDN	Catchment & Abstraction	Investigations	STP effluent review (i.e. quality, quantity from EPA report) to determine typical characteristics in effluent and the quality of treatment. Consider testing for E.coli in raw water.	9.1	Investigative Studies & Research Monitoring	Risk assessment	1.04	Mar-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Closed				STP are being upgraded, BIN and MDN are being sewered (options study).		
255	All	Catchment & Abstraction	Investigations	Consider undertaking chemical testing on groundwater supplies to establish baseline water quality	9.1	Investigative Studies & Research Monitoring	Risk assessment	1.07	Mar-2015	Medium	Manager Warrumbungle Water; EHO; Technical Officer	30-Jul-19			Implemented				Raw water testing regime program has been developed and implemented.		
256	Baradine, Kenebri, Coonabarabran	Catchment & Abstraction	Investigations	Review of existing coal seam gas investigations in the area (i.e. EPA)	9.1	Investigative Studies & Research Monitoring	Risk assessment	1.07	Mar-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Closed				Discussed at quarterly meeting. Raw water pH tested daily at Baradine and Coonabarabran, to be used as a potential indicator		
257	Mendooran	Disinfection	Investigations	Monitor the strength of the chlorine over a period of 6 months	9.1	Investigative Studies & Research Monitoring	Risk assessment	7.01	Mar-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Closed				Covered by action 198		

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
258	All		Critical control point	Council should strongly consider investing in online monitoring at all CCPs. This would provide greater process control, as immediate notification would be provided in the event an alert limit is exceeded. Importantly, it would also provide the opportunity of an immediate response in the event a critical limit is exceeded (such as triggering a plant shut down). Online monitoring would also provide useful data for analysis of performance of processes used to control hazards at CCPs and would improve understanding of the WTP's effectiveness more generally.	9.1	Investigative Studies & Research Monitoring			Mar-2015	High	Manager Warrumbungle Water; Project Engineer	28-Feb-20	30-Jun-20		Closed				Funding granted from Safe and Secure for scoping study of automation. 13/12/19; PLC are needed to install online analysers 28/2/20: Closed as covered under A328.	To be included as part of process monitoring, automation and instrumentation project (action 328)	
259	DDO	Catchment & Abstraction		DDO to be tested prior to new bore installation. Results to be followed up.	9.1	Investigative Studies & Research Monitoring	Risk assessment	1.12	Mar-2015	High	Technical officer	03-Aug-21		Intermin (Tech Officer develop schedule)	Closed				13/12/19: Bore is being used. Raw water quality assurance plan includes bore testing. Have NSW Health funding to take baseline sampling, some still to be taken, (Health officer has since left) 28/2/20; Schedule to be developed 24/7/20: labels for Sth bore background testing got lost (AM follow up with Health); RWQ procedure requires updating re CBN hydrogeological report (JG); RW sampling schedule to be developed (JG) 24/11/20: new Sth labels received; 2 lots of samples taken at DDO, CLH, MDN. BWY; one last lot outstanding (to spread tests out) - some results received back, given to JG for entry in RW database 25/3/21: FS to develop schedule in line with RWQ procedure for bore background testing (CN/admin officer to assist) 3/8/21: DDO bore was installed in 2014 and is in use since; meanwhile a RWQ assurance program incl background testing has been developed --> see atcion A347	Supervisors to take samples for the bore baseline sampling program. Tech Officer to create schedule (baseline and ongoing)	
260	All		Documentation / Protocol	As part of Council's review of the DWMS risk assessment, review and discuss the effectiveness of existing processes and procedures in managing water quality. The review should draw on external research and information, the risk assessment, water quality analysis and organisational experience. With any changes in conditions, processes and procedures should be revalidated.	9.2	Validation of Processes			Sep-2015	Low	Manager Warrumbungle Water	27-Aug-19			Closed				Covered by review of DWMS review and update (action 334)		
261	Coonabarabran	Catchment & Abstraction	Investigations	Review PAC dosing effectiveness. Detention time for PAC limiting factor	9.2	Validation of Processes	Risk assessment	1.1	Mar-2015	Medium	Supervisor North; Technical Officer	13-Dec-19			Closed				Calculations previously performed, to be reviewed and effectiveness considered as part of PAC upgrade investigations. 13/12/19: Calculations have been reviewed detention time can be improved by moving dosing point upstream. PAC currently used as an aid in flocculation and detention time is sufficient for flocculation (not for algae). If there is an algae bloom, source water can now be switched over to bores (previously not a option). Action has been closed.		
262	All	CT	Investigations	Review and confirm the various data gaps in Table 11 to calculate CT for all supply systems.	9.2	Validation of Processes			Mar-2015	High	Supervisors; Technical Officer	13-Dec-19	15-Oct-19	was 30/9/19	Complete				27/9/19: engaged CWT to calculate CTs; supervisors/SS to provide info as required refer to ID 326 13/12/19: CTW were engaged to calculate CT. Report has been provided		
263	All		Documentation / Protocol	Develop a policy on validation of new or upgraded water supply infrastructure. This should include witness, demonstration and commissioning requirements that are designed to ensure the infrastructure delivers the expected water quality results.	9.3	Design of Equipment			Sep-2015	Medium	Manager Warrumbungle Water	24-Nov-20	30-Sep-20		Complete				In progress, no documents yet developed 24/4/20: Increased priority to Medium. Consulting provided proposal 24/11/20: Validation policy created, implementation required	Draft document	
264	All		Documentation / Protocol	Review existing documentation on the water supply systems and ensure all are captured on Council's document management system. Verify documents are UpToDate.	10.1	Management of Documentation & Records			Sep-2015	Low	All	24-Nov-20	30-Nov-20	was 30-9-19; revise next month	Closed				InfoXpert used as document management system. Incoming correspondents are documented. Staff have received training. Implementation still ongoing. 27/9/19: added to supervisor checklists; Jacinta provided current location + procedure 24/4/20: Ongoing action for staff to put documentation 24/11/20: included in (A268)	Water project information to be put on InfoXpert (all)	
265	Mendooran	Distribution	Documentation / Protocol	That WSC review and regularly revise these water supply reticulation plans (Figures 4 & 5) as required to maintain an up to date records.	10.1	Management of Documentation and Records	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Supervisor South; GIS Officer	22-Jan-19			Implemented		In collaboration with Council's GIS Officer				
266	All		Documentation / Protocol	Continue to document information pertinent to all aspects of drinking water quality management.	10.1	Management of Documentation & Records			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Implemented						
267	All		Documentation / Protocol	Develop a procedure that manages document control for all DWMS documentation (i.e. ensure the currency, accessibility and appropriate review DWMS documents).	10.1	Management of Documentation & Records			Sep-2015	Medium	Manager Warrumbungle Water	24-Apr-20			Closed				24/4/20: Closed as covered by under new action 334, review and update DWMS.	Include as part of DWMS review and update (action 334)	
268	All		Documentation / Protocol	Develop a records management process to ensure appropriate storage and accessibility of DWMS related records. Including (A264): Review existing documentation on the water supply systems and ensure all are captured on Council's document management system. Verify documents are UpToDate.	10.1	Management of Documentation & Records			Sep-2015	Medium	Manager Warrumbungle Water	03-Aug-21	TBD		In progress				24/4/20: Procedure (Drinking water management system document register procedure) has been developed. Still to be reviewed and implemented 3/8/21: additional admin support required to implement and abide by formalised DWMS records requirements	Procedure to be reviewed and implemented	
269	All		Documentation / Protocol	Update details for existing documentation in the DWMS document register.	10.1	Management of Documentation & Records			Sep-2015	Medium	Manager Warrumbungle Water	24-Apr-20			Closed				24/4/20: Closed as covered by under new action 334, review and update DWMS.	Include as part of DWMS review and update (action 334)	
270	ALL	Information Systems	Operations	· Generate a list of equipment contained on site and store equipment operation and maintenance manuals on site. · Routinely (daily) measure the instantaneous chemical dose rate and daily chemical usage. Also record instantaneous and daily plant flow rates to determine actual chemical dose rates. This is useful for chemical and plant optimisation and future troubleshooting and operations. · Install a calibration tube to allow instantaneous chemical dose rates to be measured.	10.1	Management of Documentation and Records	Hunter H2O Audit 2014	BIN004, BUG002, COH002, DUN003, KEN002,	2014	Medium	Supervisor Treatment	24-Apr-20	TBC	Prioritised under automation scoping project	Closed		· Instantaneous chemical dose rates, daily chemical usage, instantaneous and daily plant flow rate data is currently not being recorded. This data is important for plant operation, optimisation and troubleshooting · Equipment operation and maintenance manuals are currently not stored onsite. Access to equipment manuals can assist in equipment troubleshooting and operator training.		Development of schedules covered under action 340. Calculations to be undertaken for chemical dose and usage rate (In conjunction with action 213) Calibration tube - MDN to be replaced (others all have them) 24/4/20: Chemical dose rate being calculated. Cannot currently measure daily chemical usage. Ability to enable chemical usage included as part of automation scoping study recommendations. Additional equipment needed. MDN calibration tube still needs cleaning Action closed, *Development of schedules covered under action 340. *Chemical dose rate being calculated. *New actions for outstanding items 348 and 349	Chemical usage equipment required, dependent on priorities in Hunter H20 scoping study automation project	
271	BDN, CLH (MDN/KBI?), BUG	Information Systems		Display the pressure vessel calibration certificates nearby the pressure vessels.	10.1	Management of Documentation and Records	Hunter H2O Audit 2014	MEN003, KEN004	2014	High	Supervisor Treatment; Technical officer	24-Jul-20	30/06/2020		Complete	Calibration certificates for pressure vessels are not stored on site; Plant pressure vessels currently do not have calibration certificates displayed			27/9/19: check new bore sites for pressure vessels; no progress on MDN (see ID 272) current pressure tanks are for water (bores) + compressor vessels at BDN, CBN, MDN 13/12/19. Clarifying which contractors do this 28/2/20: Australian Boilers Services undertake this for Dubbo. 24/4/20: Received quote from contractor (MDN, CBN, BAR) 24/7/20: certificaton has occurred in June; required every two years; on Supervisor Treatment list		
272	Mendooran	Information systems		Perform pressure vessel calibration and display certificates on site.	10.1	Management of Documentation and Records	Hunter H2O Audit 2014	MEN005	2014	High	Supervisor South	27-Aug-19	31/08/2019	closed 27/9/19	Closed	Plant pressure vessels currently do not have calibration certificates displayed			see ID 271		
273	Mendooran	Reservoirs	Documentation / protocol	That WSC urgently develop and implement a regular (weekly/monthly/annual) reservoir integrity inspection and reporting program for the Mendooran water supply system. This inspection and reporting program should be used to develop an Action Plan in order to urgently address all the existing integrity issues at the Mendooran water supply system. Annual reservoir integrity reports to be submitted to DPI-Water in accordance with LWU Circular No. 18.	10.2	Reporting	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	28-Feb-20	28-Feb-20		Closed		Finance assistance being sought through NSW Health for development of Standard Operating Procedures, including reservoir inspections. Reservoir access to be addressed through WHS training.		Engaging contractor to develop reservoir integrity checklist to undertake inspections. Including assessing WHS issues that are limiting inspections currently. Visuals inspections are currently recorded in diaries. 13/12/19: Engaged WEARS to develop reservoir integrity checklist to undertake inspections 28/20/20: Action closed as covered by new action 343	Follow up with WEARS	
274	Mendooran		Documentation / Protocol	That WSC undertake an annual internal review of its DWMS, using the HH2O revised NSW Health's annual report template and consult their local PHU to develop an appropriate external review/audit frequency.	10.2	Reporting	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented			Quarterly internal reviews undertaken			
275	All		Documentation / Protocol	Develop inhouse evaluation of long-term water quality performance procedures (outside external monitoring requirements) and implement these procedures. These procedures could be incorporated into the preparation process for the annual management review or as part of the internal audit process.	11.1	Long-Term Evaluation of Results			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Implemented				Annual review 6 monthly level of service report (non compliances, boil water alerts etc.) Quarterly DWMS reviews undertaken Fortnightly review of CCP data (exceedance summaries), sent to Supervisors and Manager and reviewed in operations meeting. Monthly report to General Manager of CCP exceedances		
276	All		Documentation / Protocol	Ensure all handwritten water quality data is captured in electronic spreadsheets.	11.1	Long-Term Evaluation of Results			Mar-2015	High	Manager Warrumbungle Water	30-Jul-19			Implemented						
277	All		Documentation / Protocol	Develop internal audit procedures and schedules appropriate to functionality of council and the water supply systems.	11.2	Audit of Drinking Water Quality Management			Sep-2015	Low	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				13/12/19: Consultant has provided proposal to review and update DWMS 28/2/20: Closed as included as part of action 334	Review schedule as part of DWMS project update (action 334)	
278	All		Investigations	Identify appropriate personal to undertake the internal audit and provide training in auditing.	11.2	Audit of Drinking Water Quality Management			Sep-2015	Low	Manager Warrumbungle Water	24-Apr-20	TBD		Not started				Wait until NSW Health audit guidance is audits		
279	All		Critical control point	Document and report results of CCP exceedances in annual report for Council	11.2	Audit of Drinking Water Quality Management			Sep-2015	Low	Manager Warrumbungle Water	24-Apr-20	31-Oct-19		Complete				CCP results reported monthly to General Manager. Annual report being developed (to go to Council) 24/4/20: Annual report complete and sent to NSW Health		
280	All		Documentation / Protocol	Develop external audit procedures in consultation with NSW Public Health Unit.	11.2	Audit of Drinking Water Quality Management			Sep-2015	Low	Manager Warrumbungle Water	24-Apr-20	TBD		Not started				Wait until NSW Health audit guidance is audits		
281	Mendooran		Documentation / Protocol	That WSC develop and implement a DWMS review and continual improvement program which is regularly reviewed by the Senior Executive Team and reported to Council.	12.1	Review by Senior Executive	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented			Improvement Plan is under review, to be discussed in details at next DWQ review meeting			
282	Mendooran		Documentation / Protocol	That notices received from DPI-Water should be regularly reported to senior management together with an Action Plan, Works Budget and Timeline for the rectification of issues raised during DPI-Water Inspections. This Action Plan information should also be regularly reported back to DPI-Water and NSW Health.	12.1	Review by Senior Executive	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented			List of outstanding recommendations has been created			
283	Mendooran		Documentation / Protocol	That WSC review and update the DWMS and the "DWMS Improvement Plan" is then kept up-to-date, recommended improvements are implemented in the order of identified urgency and progress of the "DWMS Improvement Plan" is reported regularly to the Senior Executive Team and Council. This information should also be passed onto NSW Health and DPI-Water for advice, review and comment. (Noting that actions from many of the other Recommendations in this report would need to be included in this DWMS Improvement Plan)	12.1	Review by Senior Executive	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	13-Dec-19	31-Oct-19		Implemented	Improvement plan is being consolidated		Refer to R11 and R12		Improvement plan has been consolidated. Plan to be provided to NSW Health as part of annual review. Quarterly updates to be provided to Council. 13/12/19: Improvement plan and annual review report have been provided to NSW Health		
284	All		Documentation / Protocol	Amend/update the DWMS where it is evaluated that there is a need for change.	12.1	Review by senior executive			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Closed				Covered by DWMS update (action 334)	Include as part of DWMS review and update (action 334)	

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
285	All		Documentation / Protocol	Develop and implement a process (including a schedule) for senior executive review of the effectiveness of the management system. The review process should include aspects such as; reports from audits, water quality performance, previous reviews, concerns from consumers and regulators and impacts of changes to internal or external conditions (e.g. regulatory, technology, organisational activities).	12.1	Review by senior executive			Mar-2015	High	Manager Warrumbungle Water	28-Feb-20	30-Jun-20		Closed				Quarterly DWMS reviews undertaken Fortnightly review of CCP data (exceedance summaries), sent to Supervisors and Manager and reviewed in operations meeting. Monthly report to General Manager of CCP exceedances. Draft schedule has been drafted. To be implemented 28/2/20 No longer reporting monthly to General Manager. Annual update to Council (DWMS annual review report and improvement plan tabled). Review schedule to be formalised in DWMS update. Closed as included as part of action 334	Schedule to be formalised in DWMS. Include as part of DWMS review and update (action 334)	
286	All		Documentation / Protocol	Update and review Implementation Plan when necessary. Follow up actions to ensure deadlines are met and responsible parties are capable to undertake these actions.	12.2	Drinking Water Quality Management Improvement Plan			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Implemented				Plan has been compiled and in process of reviewing.		
287	All	Bores	Monitoring	Monitoring of ALL WSC bores be increased which includes: □ Turbidity □ pH □ Microbiological □ Temperature □ Pesticides □ Heavy Metals □ Radiological □ Fluoride			July 2018 ORANA meeting	WarrumSCJul18.1	Jul-2018	Medium	Technical Officer	13-Dec-19	28-Feb-20	Interim deadline was 13/9/19 (review RWQ assurance program)	Closed				Raw water quality assurance program has been developed. To be implemented. 27-9-19: similar to ID 120 13/12/19: RWQ plan still to be reviewed for this requirement Action closed, included as part of new action A347	Review raw water assurance program against this requirement see items 120, 253, 287, 313)	
288	All	Raw water	Monitoring	It should be noted that radiological tests are generally recommended every 2 years for bore waters and every 5 years for surface water. As these tests are infrequent, they can often fall out of a routine sampling program and it would be prudent for WSC to check if these test have been undertaken for both bores and surface waters.			July 2018 ORANA meeting	WarrumSCJul18.2	Jul-2018	Medium		27-Aug-19			Complete				Radiological testing has been undertaken (July 2019) and is included in raw water monitoring assurance plan.		
289	All	Disinfection	Training	Training needs to be undertaken on the chlorine test kits to ensure operators are aware of the different testing ranges.			July 2018 ORANA meeting	WarrumSCJul18.3	Jul-2018	High	Technical Officer	27-Aug-19			Implemented				Technical officer provided SOPs, training and necessary reagents to operators.		
290	Mendooran	Filtration	Operations	online combined filtered water turbidity meter was reading consistently and significantly lower than the bench unit. WSC will require ongoing investigations, which may include external calibration of both the online and bench unit to confirm what the true turbidity values are and to resolve the discrepancy between the units.			July 2018 ORANA meeting	WarrumSCJul18.4	Jul-2018	High	Supervisor Treatment	24-Nov-20	31-Aug-20		Complete				Has been externally calibrated. 27/9/19: confirm range of instrument; confirm bypass is not an issue (should be inline?); cleaned regularly? 13/12/19: Issue not resolved 28/02/20: Issue not resolved. Test against hand held unit. Similar issues at other plant. 24-7-20: IPAC instrument calibrations were done in March 2020; online NTU meter being cleaned daily; benchtop one calibrating ourselves weekly 24/11/20: still a light discrepancy but not major since calibrations and bench-top instrument replacement + additional staff training + proper cleaning units/techniques for instruments + adjustments with set-up + regular future services by supplier (Hach) --> complete	To be investigated further Get calibration kit (low)	
291	Mendooran	WTP	Documentation / Protocol	Within the new package of works planned for this plant it is recommended that a new set of P&IDs be created and the current plant along with upgrades go through the HAZOP process.			July 2018 ORANA meeting	WarrumSCJul18.5	Jul-2018	Medium	Project Engineer	24-Apr-20	30-Sep-20	Interim (finish concept design)	Closed				24/4/20: Preliminary hazard assessment included in current engagement, scheduled for 14 May 2020. Concept design workshop to be held in following with to hazard assessment. Not at stage for HAZOP. Action closed, as now covered into new combined Action 345		
292	Coonabarabran, Mendooran, Binnaway	Monitoring	Operations	Due to an increasing taste and odour issue, it was recommended that WSC look at additional testing in the sedimentation lagoons including MIB and Geosmin, chlorophyll-a (algae), pH, organic loadings and nutrient levels. It was noted that WSC had used PAC in the past, however it is not currently in use. This could be re-established if required, however it would be prudent to understand the cause of the taste and odour and also undertake PAC testing to determine what type and amount of PAC would be the most effective.			July 2018 ORANA meeting	WarrumSCJul18.6	Jul-2018	Medium	Supervisor Treatment	24-Apr-20	31-Jan-20	Interim was 30-9-19; now: 31/1/20 for algae tests (establish location for algae - put in operational sheet)	Closed				27/9/19: PAC has been dosed at Coonabarabran to control taste and odour issues; PAC dosing also improved filtered water NTU; SS find results from algae testing and put on T-drive (for dam, weir, sedimentation lagoon) added BWY + MDN (river/lagoons) 13/12/19: Some result have been added, still to confirm if all results have found. PAC can only be dosed at Coonabarabran. 24/4/20: No taste and odour complaints. PAC being dosed at Coonabarabran. Action closed, Coonabarabran taste and odour issues added to action 121 for further investigation		
293	BUG, KEN	Raw water	Investigations	There was discussion relating to fracking activity in the area of Pilliga Forrest. It is recommended that WSC discuss these concerns with NSW Health to determine the best testing parameters to ensure there has been no impact on groundwater.			July 2018 ORANA meeting	WarrumSCJul18.7	Jul-2018	Medium		27-Aug-19			Complete				Has been investigated, pH should be used as a parameter, which is already being tested for.		
294	ALL	Reticulation	Documentation / Protocol	There was discussion around who collects the reticulation samples and analyses them before they are sent to FASS. The Councils Environmental Health Office collects and tests the samples. There have been some issues with samples being collected at the wrong location. It was recommended that Council develop a procedure that includes photos and GPS locations to ensure that samples are always collected at the correct location.			March 2018 ORANA meeting	WarrumSCMar18.1	Mar-2018	Medium	Technical Officer	24-Nov-20	30-May-20	Interim (Found and reviewed)	Closed	July 18: Ongoing, This was discussed and the newly appointed EHO is managing this project.			Information for plan is in process of being collected. 27/9/19 & 13/9/19 & 24/4/20: info needs to go on T-drive; some photos still need to be taken; sample sites require updating (+photos added) + incident flowcharts added 24/4/20: Find procedure and photos on G drive (Simone who developed them has left) and review status. Scott to talk to Mark Nave (PHU) about changing site numbers. 24/11/20: covered under (A206)	Undertaken in conjunction with action 205 and 206 (Develop a verification monitoring plan)	
295	CBN, BAR, BIN	Fluoridation	Critical control point	The fluoride critical limit for Coonabarabran and Baradine and Binnaway need to have the limit of <0.9mg/L for >72 hours (move from the alert limit)			March 2018 ORANA meeting	WarrumSCMar18.2	Mar-2018	High		27-Aug-19			Complete				CCP reference document updated		
296	ALL	Monitoring	Monitoring	Council to review sample locations. It may be worthwhile changing some sample locations to monitor in the main rather than a household tap.			March 2018 ORANA meeting	WarrumSCMar18.3	Mar-2018	Medium		27-Aug-19			Closed	Not feasible					
297	ALL	Reticulation	Major works	There are a number of old cast iron mains that cause issues (corrosion, low chlorine residuals). Some of these mains are being replaced, consider developing a program/funding for replacing more of these sections of these mains.			March 2018 ORANA meeting	WarrumSCMar18.4	Mar-2018	Medium		27-Aug-19			Implemented				Program of replacement of mains is in place		
298	ALL	Reticulation	Investigations	Flushing of mains to assist with maintaining chlorine residuals is problematic during water restrictions (customers see that water is being wasted). Consider ways to collect and reuse the water (e.g. tankers).			March 2018 ORANA meeting	WarrumSCMar18.5	Mar-2018	Medium		01-Jul-18			Complete	Complete July 2018					
299	Baradine	Reservoirs	Minor works	There is a significant amount of sediment in the Baradine reservoir and this needs to be removed during winter.			March 2018 ORANA meeting	WarrumSCMar18.5	Mar-2018	Medium		01-Jul-18			Complete	Complete July 2018					
300	ALL	Disinfection	Critical control point	It is recommended that Council confirm that the chlorine contact time for each system has been calculated. It is recommended that a comment be added into the report (under the CCP table) to advise that the chlorine residual measured at AA must be maintained above x mg/L at y plant flowrate to meet the chlorine contact time requirement.			March 2018 ORANA meeting	WarrumSCMar18.6	Mar-2018	Very high		27-Aug-19			Closed	Ongoing July 2018			Closed covered by action 326.		
301	Binnaway	Monitoring	Investigations	The Binnaway turbidity graph indicates that there are times when the filtered water turbidity results are higher than the clear water turbidity – investigate and check data.			March 2018 ORANA meeting	WarrumSCMar18.7	Mar-2018	High		27-Aug-19			Complete	July 18: To be reviewed following filter media replacement Since the filter media has been changed the filter water data has been lower then clear water tank			Issue has been resolved following filter media inspection		
302	Coolah	Disinfection	Documentation / Protocol	The process flow diagram for Coolah needs to be modified to chlorine gas (rather than sodium hypochlorite) for disinfection.			March 2018 ORANA meeting	WarrumSCMar18.8	Mar-2018	Medium	Technical Officer	27-Aug-19	6-Sep-19	completed mid Sept-19	Complete	July 18: Ongoing				PFD to be updated	
303	Coolah	Monitoring	Critical control point	The location of Coolah critical control point CLH1 needs to be moved to prior to the reservoirs.			March 2018 ORANA meeting	WarrumSCMar18.9	Mar-2018	High		27-Aug-19			Complete	July 18: Ongoing					
304	CLH, DUN, MDN	Disinfection	Critical control point	Council could consider lowering the lower limit on Coolah, Mendooran and Dunedoo critical control point from <0.5 mg/L to <0.2mg/L once the chlorine contact time for the system is confirmed.			March 2018 ORANA meeting	WarrumSCMar18.10	Mar-2018	Medium	Technical Officer	27-Sep-19			Complete	July 18: Ongoing				Confirm this has occurred	
305	Dunedoo	Monitoring	Critical control point	Critical control point for Dunedoo DD01 needs to be moved on the process flow diagram to after the reservoir.			March 2018 ORANA meeting	WarrumSCMar18.11	Mar-2018	Medium	Technical Officer	27-Sep-19			Complete					Confirm this has occurred	
306	Dunedoo	Monitoring	Documentation / Protocol	There seemed to be some issues with the Dunedoo summary data in Table 5.3 (some rows not in correct locations, e.g. Bowman 28 Nott Street free chlorine and pH lines were swapped?). Also need to check the lower limit on figures 5.2. Review and correct			March 2018 ORANA meeting	WarrumSCMar18.12	Mar-2018	High		01-Jul-18			Complete	Completed July 2018					
307	Coonabarabran	Filtration	Critical control point	Consider modifying for Coonabarabran CCP for filtered water turbidity: • Operational target < 0.2 NTU (current value <0.8 NTU) • Adjustment Limit < 0.5 NTU (current value >0.9 NTU)			October 2017 ORANA meeting	WarrumSCOct17.2	Oct-2017	High	Supervisor North; Technical Officer	13-Dec-19	1-Jun-20		Complete	Mar 18: Turbidity targets were slightly reduced. Plant not capable of lower performance – need to consider upgrade			Currently using emergency back up bores. Filter media inspection undertaken recently (never been replaced). Turbidity target limit has been changed to 0.3 NTU, operational limit 0.5 NTu. Will have difficulty in meeting limit when source water is changed to the dam water. 13/12/19: Following improvements to filter, reduced limits should be able to be achieved when source water is changed		
308	Coonabarabran	Fluoridation	Critical control point	A new lower limit needs to be added to the Coonabarabran fluoridation CCP of <0.9mg/L for >72 hours, to be in line with the NSW Health Form 5 requirements (Fluoride Dosing Incident Notification).			October 2017 ORANA meeting	WarrumSCOct17.5	Oct-2017	High	Technical Officer	27-Aug-19			Complete	Mar 18: Some changes were also made to the fluoride CCP limits. The critical limit needs to have the limit of <0.9mg/L for >72 hours (move from the alert limit).					
309	ALL	Reservoirs	Critical control point	There were no reservoir inspections undertaken during the reporting period. The Council needs to resolve access and training so that this CCP can be implemented.			October 2017 ORANA meeting	WarrumSCOct17.6	Oct-2017	High		27-Aug-19			Closed	Mar 18: Coolah and Dunedoo reservoirs inspected daily (walk around the ground). Checklists/SWMS/SOP needs to be developed			Covered by action 107 and 310.		
310	ALL	Reservoirs	Documentation / Protocol	Council needs to develop reservoir inspection checklists for the operators and provide training on the important areas to check closely during the inspection.			October 2017 ORANA meeting	WarrumSCOct17.7	Jun-2019	High	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				Have queried contractor to assist with checklist 13/12/19: Engaged WEARS to undertake this work 28/20/20: Action closed as covered by new action 343	Follow up with WEARS	
311	Baradine	Monitoring	Critical control point	Review CCP limits for Baradine WTP, in particular, the turbidity targets are not in line with the ADWG (see action WarrumSCOct17.2 above)			October 2017 ORANA meeting	WarrumSCOct17.10	Oct-2017	High	Supervisor North; Technical Officer	27-Aug-19			Closed	Mar 18: Limits are now: Target < 0.2 NTU Alert < 0.4 NTU Critical < 0.8 NTU This is still not as low as the ADWG – this may be OK as the source water is from bores – need to check the raw water quality risk assessment			Closed. Covered by action 78		
312	Binnaway	Monitoring	Critical control point	Review CCP limits for Binnaway WTP, in particular, the turbidity targets are not in line with the ADWG (see action WarrumSCOct17.2 above). Consider ways to improve the plant performance			October 2017 ORANA meeting	WarrumSCOct17.11	Oct-2017	High		27-Aug-19			Complete	Mar 18: Filter media replacement planned for mid 2018. Review limits once new filter media performance monitoring data is available			Limits have been reduced in line with ADWG		
313	Coolah	Raw water	Monitoring	Coolah has a new bore "Back Bore" which is located 50m upstream of a previous dump site (near Pound yard and tip) in depth water quality testing should be considered, this could be requested from NSW Health			ORANA meetings pre October 2017	WarrumSCSept16.2	Oct-2017	Medium	Technical Officer; Manager Warrumbungle Water	24-Apr-20	28-Feb-20	Interim deadline was 13/9/19 (review RWQ assurance program)	Closed				Confirm if current testing (NSW Health project) is sufficient; what else should be tested for if not? 13/12/19: RWQ plan still to be reviewed 24/4/20: Scott to review record of test results for "back bore" records Action closed, included as part of new action A347	Review raw water assurance program against this requirement see items 120, 253, 287, 313)	

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
314	Binnaway	Filtration	Investigations	Filter media has been washing out of filters, further investigations could be undertaken to ensure the filter media and design is appropriate			ORANA meetings pre October 2017	WarrumSCSept16.3	Oct-2017	Medium	Supervisor South	13-Dec-19	31-Dec-19		Complete				Media has been replaced. 13/12/19: No washout has been occurring	Confirm if filter media is still washing out of filters	
315	CLH, DDO		Investigations	Coolah and Dunedoo bores may have a risk due to flooding and local land use this should be reviewed and additional monitoring could be requested from NSW Health during high rainfall/flood periods. ~~It was recommended that a memo be created.~~			ORANA meetings pre October 2017	WarrumSCSept16.4	Oct-2017	Medium	Supervisor Treatment	03-Aug-21	30-Sep-20		Closed				13/12/19: RWQ plan still to be reviewed for this requirement 24/4/20: To be included as part of an operational monitoring plan testing (A…) 24/11/20: DPIE/SSWP risk prioritisation acknowledges this, awaiting advice on (further) funding; meanwhile added NTU measurements for disinfected water at bore; regular testing part of RWQ monitoring + CLH/DDO bores included in Health funded RWQ baseline testing (recorded in RWQ database) - include (A315) here at next review; A315 can then be closed		
316	Mendooran	Sedimentation	Plant optimisation	Questions were also raised on the Mendooran sedimentation lagoons and short circuiting and increased risk of slug return of backwash water. This will be raised at the next DWCQM, Dec 2016			ORANA meetings pre October 2017	WarrumSCSept16.6	Oct-2017	High	Manager Warrumbungle Water	28-Feb-20	30-Sep-20	Interim (finish concept design)	Closed				13/12/19: Consultant engaged to undertake concept design (site visit has already been undertaken - Nov 2019) 28/2/20 Quotes to undertake work are being reviewed	Included as part of treatment water supply upgrade	
317	Coonabarabran	WTP	Plant optimisation	Further optimisation and investigation is/to be undertaken at Coonabarabran WTP.			ORANA meetings pre October 2017	WarrumSCSept16.7	Oct-2017	Medium		27-Aug-19			Closed				Covered by a variety of other specific actions		
318	Binnaway	WTP	Investigations	Review the Bligh Tanner report on Binnaway WTP and initiate recommended actions (on-line monitoring, filter replacement, telemetry, vermin protection, etc)			ORANA meetings pre October 2017	WarrumSCMar17.3	Oct-2017	High		27-Aug-19			Closed				Actions from Blight Tanner report reviewed as part of this improvement plan		
319	Binnaway		Plant optimisation	Review the pH target for Binnaway and set based on optimum for pH and calcium carbonate precipitation potential.			ORANA meetings pre October 2017	WarrumSCMar17.4	Oct-2017	Medium	Supervisor Treatment	24-Apr-20	1-Feb-21		Closed				To be further investigated 24/4/20: Not considered to be a current issue		
320	Baradine	Reservoirs	Minor works	Council to check if replacement of the ladder on the Baradine Reservoir is included in the Lower Macquarie Alliance reservoir work.			ORANA meetings pre October 2017	WarrumSCMar17.5	Oct-2017	Medium		27-Aug-19			Complete				Internal ladder has been replaced. External ladder to be investigated as part of reservoir upgrades.		
321	Baradine	WTP	Major works	Baradine plant is old and in poor condition, particularly the clarifier. Upgrade work is recommended and DPI Water (Bill Ho) recommended installing sedimentation ponds (1 for sedimentation and 1 for sludge storage). NSW Health supports the installation of a clarifier. Council to discuss further with DPI Water and NSW Health			ORANA meetings pre October 2017	WarrumSCMar17.6	Oct-2017	High		27-Aug-19			Closed	Mar 18: Council submitted EOI for Safe and Secure funding			Approval for funding for clarifier. Waiting for s60 endorsement and funding endorsement by DoI Water. Closed, covered by action 192		
322	Baradine	Disinfection	Investigations	Baradine WTP - Council needs to recalculate the chlorine contact time with the lower plant flow (10L/s, not 16L/s) and determine the chlorine residual required for effective disinfection. A previous report by Blyth Tanner advised that a residual of 4mg/L was required.			ORANA meetings pre October 2017	WarrumSCMar17.6	Oct-2017	High		27-Jun-19			Closed				Action closed. Refer to action 326	To be included as part of action 326 (review CT)	
323	Coonabarabran	Raw water	Documentation / Protocol	Coonabarabran WTP- Water sourced from the Pound Yard weir and bores has not been through a raw water risk assessment process for each separate source (it has been assessed as a combined source). A risk assessment of each source needs to be undertaken and any changes documented in the Drinking Water Management Plan			ORANA meetings pre October 2017	WarrumSCMar17.6	Oct-2017	High	Manager Warrumbungle Water, Supervisor Treatment, Tech Officer	24-Jul-20	31-Mar-21		Closed				All the raw water from the bores has been tested (some radiological results outstanding). To be included as part of risk assessments (Hunter H20 NSW Health Project) 28/2/20 - Radiological test undertaken (bores) 24/7/20: needs to be done as part of RWQ assurance program; updated risk assessment for individual systems still to be done 24/7/20: closed as included in new action A351	Risk assessment to include Pound Yard weir and bores	
324	Baradine	Disinfection	Documentation / Protocol	NSW Health to review the report on Baradine that recommended a chlorine residual of 4mg/L or otherwise the issuing of a boil water alert and provide advice to Council (review in conjunction with the CCT calculation).			ORANA meetings pre October 2017	WarrumSCMar17.6	Oct-2017	High	NSW Health	27-Aug-19			Closed				Closed, covered by action 46		
325	Baradine	Disinfection	Critical control point	Increase contact time for first customer (John Featherby), relocate service.			27 June 2019 Improvement Plan review meeting	A1	27-Jun	High	Supervisor Reticulation	24-Jul-20	6-Mar-20	was 30/9/19	Complete				To be undertaken with mains replacement works (take off rising main) 13/12/19: Works are being undertaken currently 28/2/20: Still in progress 24/7/20: completed		
326	All	Disinfection	Critical control point	Review CT for all systems			27 June 2019 Improvement Plan review meeting	A2	27-Jun-19	High	Supervisor Treatment	03-Aug-21	31-Oct-21		Complete				Refer to related actions 44, 46, 51, 60, 262, 309, 322 27/9/19: engaged CWT to review CTs 13/12/19: CWT report to be reviewed 28/2/20: Report still to be reviewed. To be reviewed at next operational meeting. 24/11/20: report had been reviewed and identified furhter input from the field (e.g. pipe diameters, pump sizes) --> pick back up once Technical Officer position is filled 3/8/21: Supervisor Treatment to follow up 07/07/21 - CCPs for Cl have been adjusted within the CCP reference guide and the DWMS. Baradine CCP lower limit for free chlorine in Baradine is not operationally acheivable and will result in to high concentrations of chlorine within the reticulation network. This will be adressed during the WTP upgrade.	Complete review of CWT report and revise chlorination CCPs lower critical limit	
327	BWY	Filtration		Investigate filter outlet valve replacement (spare valve sitting on site)			27 June 2019 Improvement Plan review meeting	A3	27-Jun-19	Low	Supervisor Treatment	03-Aug-21	30-Sep-21		In progress				Not yet installed. 24/4/20: In progress (wiring done) 3/8/21: electrical control cabinet installed near filter, requires interal filter level sensors to actuate valve; local electrician consulted		
328	All	Instrumentation		Process monitoring, automation and instrumentation project. *Council should strongly consider investing in online monitoring at all CCPs (A13 - BWY NTU, A124& A258) --> 24/11/20: only looking at filtration (NTU) and disinfection CCP, for CLH/DDO currently only considering retic CCP - all **expected to be complete by 31/12/21** *Consider implementing online monitoring of critical water quality parameters including (A212): · Raw water pH · Raw water turbidity --> 24/11/20: RW **not a priority** at this stage · Filtered water turbidity [included in dot point above] · Treated chlorine residual [included in dot point above] *Online interlocks for pH and turbidity (NTU) on outlet for filters (A54) --> 24/11/20: **in place in MDN for NTU; BDN/CBN/MDN/BWY require pH probes; BDN requires newPLC; CBN/BWY can have interlocks in place for NTU by 31/12/21** *~~Consider online turbidity meter with interlocks at BWY, BDN~~ --> removed 24/11/20 as double up from dot point above *~~Consider interlocks for meters at CBN and MDN~~ (A169) --> removed 24/11/20 as double up from dot point above *CBN - Install a second turbidity meter on the outlet of filter 2 and reconfigure the existing turbidity meter to monitor filter 1.(A130) --> 24/11/10: **complete** *CBN_Install continuous online chlorine meter to ensure continual effective disinfection/control of chlorination CCP.(A126) --> 24/11/20: **previously completed** *CBN-Connect scales for chlorine gas cylinders to SCADA. (part A165) --> 24/11/20: **previously completed** A13 - BWY: · Perform regular resting of filter headloss immediately after a backwash --> 24/11/20: no DP measurement device currently installed			27 June 2019 Improvement Plan review meeting (Compilation of actions)	A4	27-Jun-19	Very high	Manager Warrumbungle Water	23-Mar-21	31-Mar-21	Interim (gas chlorine DDO)	In progress				Funding granted from Safe and Secure for scoping study of automation. Covers action 21 13/12/19: Consultant engaged and is coming on site next week 13/12/19: PLC are needed to install online analysers 28/2/20: Teleconference workshop in December 2019. A number of actions have been included under this action (A 54, 124, 126, 258, 258, 165) Coonabarabran - Dual turbidity meters to be installed and replacement of PLC. PLC has been ordered. H20 to install individual filter analyser (only currently on one filter) 24/4/20 Quote received from Hunter H20 for filter media replacement. Consultant has submitted. Have had meeting with Consultant on progress this week. Consultant to submit further information needed to progress. 27/4/20: received automation audit report, need to review (CW, AM) to finalise; future funding for next steps of concept design and installation/constsruction uncertain; PLC in CBN being installed, BWY ordered; BDN/BWY online chlorine analysers ordered; old online CBN NTU meter being moved to BDN; CBN filter control upgrade being done this week incl dual NTU meters; SCADA upgrade progressing; BDN PLC being looked at (included in clarifier/filter replacement) 24/11/20: Autmation upgrade - draft report peer reviewed, awaiting DPIE comments, BP report to Council scheduled for Feb 2021; online monitoring implemented for NTU and chlroine at CBN (no external alarms until SCADA upgrade complete) and MDN (has external alarms), for chlorine at BWY and BDN by 4/12/20 (no external alarms until SCADA upgrade complete), for BDN & BWY NTU by 31/12/21 (no external alarms until SCADA upgrade complete), for retic chlorine at CLH and DDO (external alarms), DDO disinfection chlorine by 31/12/20 (no external alarms until SCADA upgrade complete), CLH new chlorine room expected by 31/12/21 (will enable online monitoring of disinfection CCP), chlorine and pH in BUG and KBI - interlocks are in place for BUG/KBI (shut down bore pump, external alarm once reservoir level low), can be put in place in BWY, CBN and MDN now with new PLCs (wiring required) , pH online monitiring can be done for filtered water at BDN, BWY, DDO, CBN and MDN (need to buy & install additional probes that hook to the combined chlorine analyser); RW pH/NTU only measured online in MDN - currently not affordable for any other sites/not a CCP therefore lower priority, however DPIE advised that furhter funding based on risk priotisation is likely to become available 23/3/21: BDN and BWY have online chlorine meters now + new PLC at BWY (SCADA upgrade required for external alarms; SDACA tender recommendation going to Council in April 2021); online NTU meters on order for BDN & BWY, to be installed by 30/4/21; gas chlorination for DDO by 31/3/21	Review audit report from consultant	
329	BWY	Disinfection	Major works	Chlorine room upgrade			27 June 2019 Improvement Plan review meeting	A5	27-Jun	High	Supervisor Treatment; Project Engineer; Manager Warrumbungle Water	24-Nov-20	4-Dec-20		Complete				Quotes received, to include chlorine room upgrade 13/12/19: Have received quotes, sizing to be confirmed. HunterH20 audit to be undertaken next week, HunterH20 to confirm requirements 28/2/20 Quotes to undertake work are being reviewed 24/7/20: New chlroine room on order 24/11/20: expect completion by 4/12/20 xx/xx/xx: COMPLETE	To be included as treatment plant upgrades	
330	BWY	Sedimentation Lagoons	Major works	Investigate restoring bank integrity of sedimentation lagoons (e.g. relining lagoons)			30 July 2019 Improvement Plan review meeting	A6	27-Jun-19	High	Supervisor Treatment	03-Aug-21	31-Dec-21		In progress				Requested advice from HunterH20 27/9/19: asked CWT for advice, who provided advice - next stage: ? (contractor to give price for realigning) 28/2/20: Further investigation needed 24/7/20: Capital item in FY 20/21 (relining WTP lagoon - scoping) 25/3/21: lagoon assessment undertaken by contractor; $30k budgeted in FY21/22 to undetake works 3/8/21: waiting for lagoon to dry out	Review previous advice and consider options	
331	ALL	Reservoirs	Documentation / Protocol	Council needs to develop reservoir SOP to inspect reservoir. Specific to individual reservoir requirements			27 June 2019 Improvement Plan review meeting	A7	27-Jun	High	Manager Warrumbungle Water	28-Feb-20	31-Mar-20		Closed				Operators have undertaken working at height training. 13/12/19: Engaged WEARS to undertake this work 28/20/20: Action closed as covered by new action 343	Follow up with WEARS	
332	All	Fluoridation		Replace fluoridation systems and staff training			27 June 2019 Improvement Plan review meeting	A8	27-Jun	High	Manager Warrumbungle Water	24-Apr-20	31-Dec-20		Closed				13/12/19: Confirmed to be undertaken as part of Hunter H20 NSW Health project. 28/2/20: Internal meeting today with Health on design. Scheduled a workshop in March to present design 24/4/20: Action closed and included as part of action 346		
333	All	Reservoirs		WHS upgrades and fencing of reservoirs, circular 18			27 June 2019 Improvement Plan review meeting	A9	27-Jun	High	Manager Warrumbungle Water, Supervisor Treatment	24-Jul-20	30-Jun-21		Closed				Funding FY19/20 13/12/2019: Circular 18 not yet submitted. 6 reservoirs still to be inspected, difficulties in getting Aqualift to undertake inspection. To get WEARS to undertaken inspections/cleans for remaining reservoirs. 28/2/20: Circular 18 submitted January 2020. 24/7/20: closed as included in new action A352	To arrange quote to get WEARS to undertake reservoir inspections/cleans for remaining 6 reservoirs.	

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
334	All	DWMS		Review and update DWMS *Develop, document and implement a process for reviewing formal requirements every 12 months or where there are any changes to Council's activities or formal requirements (A4) * Formally document and communicate roles and responsibilities of staff relating to management of drinking water quality. (A6) * Develop a regular review process to update the list of stakeholders. Ensure contact details are current and all relevant parties are involved in engagement processes.(A7) *Develop appropriate mechanisms for stakeholder commitment and involvement. Document the planned approach including partnership agreements or Memorandum of Understanding (MoU). (A9) * Ensure all operational procedures are documented and referenced in the DWMS document register (A117) * As part of Council's review of the DWMS risk assessment, review and discuss the effectiveness of existing processes and procedures in managing water quality. The review should draw on external research and information, the risk assessment, water quality analysis and organisational experience. With any changes in conditions, processes and procedures should be revalidated. (A260) * Describe process for document control for all DWMS documentation (i.e. ensure the currency, accessibility and appropriate review DWMS documents).(A267) * Update details for existing documentation in the DWMS document register.(A269) * Develop internal audit procedures and schedules appropriate to functionality of council and the water supply systems.(A277) * Develop and implement a process (including a schedule) for senior executive review of the effectiveness of the management system. The review process should include aspects such as; reports from audits, water quality performance, previous reviews, concerns from consumers and regulators and impacts of changes to internal or external conditions (e.g. regulatory, technology, organisational activities).(A285) * Review and update contact details listed in Table 10.(A334)			27 June 2019 Improvement Plan review meeting (Compilation of actions)	A10	27-Jun-19	High	Manager Warrumbungle Water	03-Aug-21	30-Sep-21		In progress				External project 13/12/19: Consultant has provided proposal to review and update DWMS 28/2/20: To update follow the risk assessment review (A20) No longer reporting monthly to General Manager. Annual update to Council (DWMS annual review report and improvement plan tabled). Review schedule to be formalised in DWMS update. 24/7/20: as per comment 28/2/20 24/11/20: Monthly reporting to GM resumed; still waiting on HH2O to commence Health funded risk assessment review 25/3/21: engaged ATOM to undertake DWMS update, had inception meeting, site visits scheduled for 19 + 20/04/21 3/8/21: received DWMS Update draft		Consultant
335	Coonabarabran	Disinfection		Review location and replace safety shower and eyewash for chlorine room			30 July 2019 Improvement Plan review meeting	A11	27-Jun	High	Supervisor Treatment	24-Nov-20	next week		Complete				Met with safety officer to review location and determine number of safety showers. 13/12/19: Shower and eyewash purchase, waiting to install 28/02/2020: to be installed by 6 March 24/7/20: landing still do and then to install eyewash 24/11/20: complete		
336	All			Develop a process to regularly monitor and test safety showers and eye washes, include developing a register			27 June 2019 Improvement Plan review meeting	A12	27-Jun-19	High	Supervisor Treatment, Technical Officer	03-Aug-21	30-Sep-21		In progress				27/09/19: SS prepared draft checklist (16/08/19); locations need to be added; created carbon copy book/record documentation for each site (1xDDO sewer, 1xDDO water; 1xCLH water, 1xCLH sewer; 1xMDN water; 1xBWY water; 1xCBN sewer, 1xCBN water; 1xBDN water, 1xBDN sewer?) - check with supervisors what is practical 13/12/19: SS to add remaining locations and check with Supervisors 28/2/20: Register still being finalised, Supervisors to review once finalised. 24/11/20: Technical Officer position vacant since July 2020, hence no progress, however item is listed on site maintenance whiteboards 3/8/21: Tech officer to develop carbon copy books for weekly checks in liaison with Supervisor	Tech Officer to add remaining locations and check with Supervisors	
337	All			Ensure appropriate confined space signage is in place			27 June 2019 Improvement Plan review meeting	A13	27-Jun	High	Supervisor Treatment	24-Nov-20	31-Aug-20		Complete				Consultant to be engaged to develop register: 27/9/19: consultant cannot start before mid December 13/12/19: Consultant scheduled for mid Jan 2020 28/2/20 Consultant is preparing confined space register. Signage to be purchased and installed following development of register. 24/7/20: register completed - confirm if signage installed everywhere (AM to check) 24/11/20: AM confirmed all complete (compared against register) except signs for new lids at CBN WTP (got stickers but need something more permanent)		
338	Dunedoo	Reservoirs		Replace Rhodes Street reservoir roofs (reservoir rehabilitation project)			27 June 2019 Improvement Plan review meeting	A14	27-Jun	High	Manager Warrumbungle Water; Supervisor Treatment	24-Jul-20	8-Apr-21		Closed				27/9/19: waiting on WEARS quote; need to provide them design of Bullinda St roof 13/12/19: WEARS have provided estimate 28/20/20: Final design needed to confirm costing 24/7/20: closed as included in new action A352		
339	All			Develop system wide SOPs * Formally document any procedure related to existing control measures identified in the risk assessment that are not currently documented. Involve relevant staff in the development of these procedures.(A85 & 103) * Compile all SOPs into an operations manual (A86) Develop SOPs for: * Laboratory water quality sampling and testing (A131) * Scheduled maintenance tasks (A131) * Daily rounds (A131) * Plant operations (A131)batching and dosing (A104) * filter maintenance (A105) * distribution failures such as main breaks, sufficient flushing, cleaning of tools (A108) notification procedure for mains breaks (A109), closing household property meters prior to recommissioning mains (A110) * Monitor the sedimentation ponds daily for contamination sources such as dead animals(A216) * Consider sampling and testing program following mains repairs -SOP to be developed for pipe break repairs (and include monitoring) (A99) DWMS documentation: * Ensure all operational procedures are documented and referenced in the DWMS document register (A117)			30 July 2019 Improvement Plan review meeting	A15	30-Jul-19	High	Supervisors	03-Aug-21	30-Jun-21		In progress				Refer to related actions 85, 86,103,104, 105, 107, 108, 109, 110, 131, 103, 216 27/9/19 & 13/12/19: supervisors to identify which other SOPs are required once we receive the ones from HH2O - then get quote from them to develop those/the rest 28/2/20 - Staff meeting scheduled for 9 March 20, Supervisors still to identify SOPs required 24/11/20: AM to request quote from CWT for development of (selected/prioritised) outstanding procedures 25/3/21: this item has now also become part of WW Acition Plan (employee engagement survey) 3/8/21: Supervisor/s to follow up with consultant (Peter Mosse)	Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOP/SWMS	Consultant
340	All		Documentation / Protocol	That WSC investigate and implement a formalised **preventative maintenance program** for all the WTP, reticulation and reservoir assets. Including maintenance schedules (Action 168 and 172) *Identify critical equipment and develop procedures to maintain, repair and replace equipment as necessary (A190)	4.4	Equipment Capability and Maintenance	30 July 2019 Improvement Plan review meeting (compilation of actions)	A16	Jul-2019	Medium	Supervisors	03-Aug-21	TBD		In progress				Operation and maintenance schedules to be prepared by HunterH20 as part of NSW Health DWMS project. 13/12/19: Confirmed that maintenance schedules for WTP are to be undertaken as part of Hunter H20 NSW Health project. Will follow fluoridation project. 3/8/21: received O&M schedules for WTPs from HH2O in June 2020; formalised program outstanding as well as schedules fro retic and reservoirs (reservoir items covered in weekly checklists - A 343) A190: 30/7/21: Critial spares list developed (on paper), needs to be recorded digially/formalised within DWMS --> record under Asset Mgt and update when equipment is being serviced (sewer pumps)		Consultant
341	All	All	Documentation / Protocol	Develop an Emergency Response Plan (ERP)/Incident Response Plans (IRPs), including; *Review and finalise ERP in DWMS Implementation Report (2016)(A232) * Establish a rapid communication system to deal with unexpected events (A138 & 223) * Train relevant staff in these procedures (rapid communication incident response) and maintain a record of training. (A139) *Define communication protocols with the involvement of relevant agencies and include in the protocols a contact list of relevant agencies and businesses and their relevant key people.(A225) * Identify an appropriate person to handle all incident and emergency communications and ensure they are appropriately trained (A228) * Develop a process for documenting and reporting of an incident or emergency.(A235) *Employees should be trained and protocols regularly tested in the emergency response plans. The requirement for this should be included in the ERP.(A236) *Develop a process for investigation following incidents and emergencies and document this process. Include in this process a mechanism for revision of any emergency protocols, where an investigation demonstrates it is required.(A234) * Identify possible water quality related incidents and emergency scenarios (the risk assessment should be used as a basis) and document these potential scenarios in an Incident and Emergency Response Plan. Document procedures and response plans to address these incidents (can refer to guideline protocols from NSW Health as provided in the DWMS). Add to the ERP particular processes that are required to address severe hazard / emergency scenarios, such as algal blooms, fuel spills, bushfire etc. The development of these protocols should involve relevant agencies.(A233) *Reference dialysis process in ERP (A229/224) *Undertake an exercise of the incident response plan with PHU following finalisation of ERP (A232)			Febray and July 2020 review meeting (compiled action)		Feb-2020	High	Manager Warrumbungle Water	03-Aug-21	31-Dec-21		In progress				28/2/20: Confirmed that development of ERP is to be undertaken as part of Hunter H20 NSW Health project. Actions 8, 138, 139. 223, 225, 228, 232, 233, 234, 235 closed and are now covered under this action. Progress delayed (prioritised filter inspection) 24/7/20: added actions 139, 236 and 342 to this item; Also refer to Action 224/229 (dialysis list/notification procecure; low priority) 3/8/21: IRPs developed in draft by HH2O in Oct-2020; mock events scheduled for 24/25 August 2021		Consultant
342				Undertake an exercise of the incident response plan with PHU following finalisation of ERP (A232)					Feb-2020	High	Manager Warrumbungle Water	24-Jul-20	30-Jun-20		Closed				28/2/20: New action created, to be undertaken following completion of 341 (ERP)		
343	All			Development of document to undertake regular reservoir inspections: * Consider a routine reservoir inspection (checking locks etc.), A106 *develop reservoir SOP (specific to individual reservoir requirements((A334 & 107) *develop reservoir inspection checklists for the operators (A310) *Train operators in reservoir inspections (A310) *Develop regular (weekly/monthly/annual) reservoir integrity inspection and reporting program (A273) * Assess compliance regarding reservoir access with Australian Standards and common sense (A84)			Febray 2020 review meeting (compiled action)		28-Feb-20	High	Supervisor Treatment	03-Aug-21	31-Dec-21		In progress				28/2/20: New action created to compile a number of related actions (A334, 107, 310, 273, 84) Visuals inspections are currently recorded in diaries. Engaging contractor (WEARS) to develop reservoir integrity checklist to undertake inspections. Including assessing WHS issues that are limiting inspections currently. 24/7/20: WEARS to redevelop (got lost) 24/11/20: reminded WEARS 3/8/21: checklists still outstanding from WEARS	Follow up with WEARS	
344				Review and respond to NSW Health cryptosporidium risk model letter			April 2020 review meeting			High	Manager Warrumbungle Water; Supervisor Treatment; Technical Officer	24-Jul-20	30-May-20		Complete				24/4/2020: Letter received by NSW Health 20 December 2019, request still to be reviewed and responded to	Internal to meeting to complete	



WATER TREATMENT SPECIALISTS

Baradine Sewerage Scheme Upgrades – Scoping and Options Report

For Warrumbungle Shire Council

WBS1433-06-REP-B

28 September 2021

Baradine Sewerage Scheme Upgrades – Scoping and Options Report

For Warrumbungle Shire Council

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Issue Date	Revision	Issued to	Prepared by	Reviewed by	Comments
23/12/2020	A	CW	NT/MMC	MMC	Draft for review
28/09/2021	B	JB	MMC	PM	Final

Contents

Figures

Tables

1 Introduction

1.1 Overview

City Water Technology (CWT) was engaged by Warrumbungle Shire Council (WSC) to conduct a scoping study that will feed into the design and construction of Baradine Sewerage Treatment Plant (STP) inlet works to improve current treatment performance.

The Baradine STP provides sewerage treatment for the township of Baradine located on the Coonabarabran road, about midway between Coonabarabran and Pilliga in the central western area of New South Wales. Currently, the plant receives flows from the township of Baradine via a vacuum collection system. The treatment system is pond-based and consists of a pump station and lagoons. Sewage enters the first oxidative/facultative ponds before it flows to a maturation pond and subsequent storage lagoon. Effluent from the STP is reused by the neighbouring property for irrigation purposes. Reportedly, the oxidation/facultative ponds have not been desludged ever since commissioning in 1997.

Currently, the STP is configured with no inlet works, and as a result, rag build up has been a major concern for WSC. This causes a reduction in hydraulic and treatment capacity resulting in effluent quality issues and potentially sewage overflows directly to the surrounding environment. The current treatment capacity of the STP is also unknown – presenting challenges in planning for growth servicing and potential infrastructure development.

The study will also assess the current STP capacity in order to identify potential upgrades required to enable growth servicing and economic development within the community. Furthermore, the study will also review the previously identified options and identify any additional options for connection of Camp Cypress to the sewerage system including reviewing the loadings and assumptions used to develop the options, infrastructure sizing and cost estimates.

1.2 Description of the Existing STP System at Baradine

1.2.1 Process Description

The Baradine STP is a pond treatment-based system which consists of one pump station and ponds that receive flows from the township of Baradine via a vacuum collection system. Inflow to the Baradine STP is not monitored.

The STP has an "inlet box" with no screening which creates a major issue as rag build up in the lagoon reduces the lagoon capacity as well as affecting effluent quality and can lead to overflows directly into the surrounding environment. Effluent quality issues cause environmental and safety concerns in regard to the water released to the neighbouring private property for irrigation purposes.

A process flow diagram showing the major processes at Baradine STP is presented in Figure 1-1.

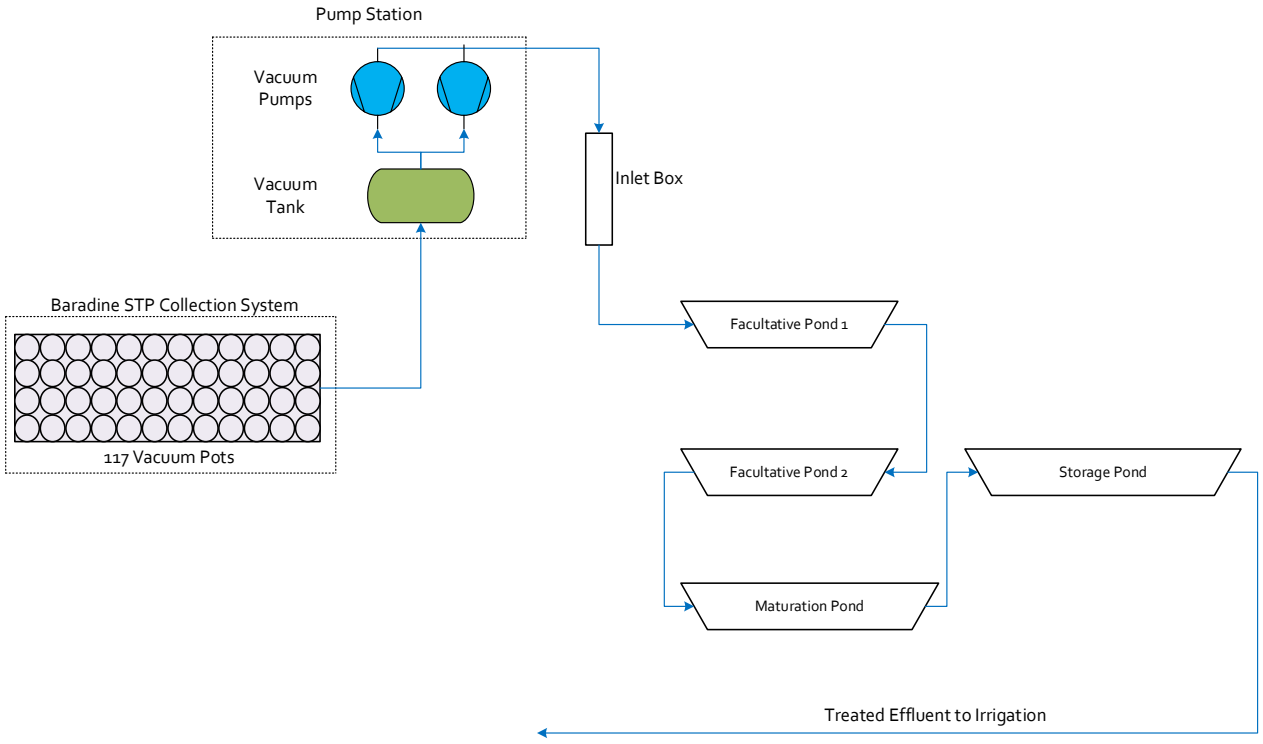

Figure 1-1: Baradine STP Process Flow Diagram

2 Design Basis and Plant Performance

2.1 Data Collection and Review

It is noted that no influent sewage monitoring is currently undertaken at Baradine STP. This presents challenges in capacity planning and design studies for the STP system. A gap analysis of data reviewed has identified several parameters for which additional sampling could be undertaken for determining operational limits on process performance. The following process streams and or sampling locations were identified.

Table 2-1: Baradine STP Sampling Points Proposed

Number	Description	Type of Monitoring	Sample Type
1	Influent	Quality and volume	Autosampler – or alternative
2	Pond Inlet (All Ponds)	Quality	Grab samples – twice daily for minimum of 2 weeks
3	Pond Outlet (All Ponds)	Quality	Grab samples – twice daily twice daily for minimum of 2 weeks

Effluent quality monitoring is conducted as per the Baradine STP licence requirements (Refer to Section 2.2.3).

Table 2-2: Suggested Monitoring Program for Baradine STP

Parameter	Influent	Ponds	Final Effluent
Soluble BOD/COD	x	x	x
Total BOD/COD	x		
Suspended Solids	x	x	x
Ammonia	x		x
Nitrate			x
TKN	x		x
Total phosphate	x		x
DO	x	x	x
pH	x	x	x
Temperature	x	x	x
E.Coli			x

Dissolved oxygen (DO), pH and temperature should be measured weekly by WSC operators beyond the intense sampling period described above. It should become normal practice for Council. Appropriate portable instruments may need to be purchased. Training should be provided on the use of those instruments, particularly the DO meter.

2.2 Current Influent and Effluent

2.2.1 Influent Flow

Influent flow is currently not measured. In typical sewage treatment systems, influent flow monitoring is required for license purposes, however as noted in section M6.1 of EPL 5950, the STP discharge flow is monitored by calculation method (pump capacity multiplied by operating time).

Sewage flow to Baradine STP is reportedly not influenced by wet weather events. Average dry weather flow (ADWF) has been estimated using current the number of sewer connections in Baradine and non-residential flows as estimated from Trade Waste Discharge water use data.

The ADWF to Baradine STP has been estimated to be approximately 205 kL/d.

There was no data available to determine diurnal flow patterns, however the following peaking factors size town were used to estimate the peak flows.

- Peak Wet Weather Flow PWWF) Peaking Factor – 4.0 (for vacuum sewer)
- Peak Dry Weather Flow (PDWF) Peaking Factor - 2.6

The historical Queensland approach was adopted for peaking factor estimation.

Peaking factor for PDWF = $4.7 \times (EP)^{-0.105}$

Peaking factor for PWWF= 3.5 to 5

2.2.2 Influent Composition

Appendix A shows the estimated volume contribution from the non-residential sources in the Baradine STP Catchment. The relative contribution of trade waste to the overall sewage flow and quality is relatively low in the Baradine catchment. Trade waste customers contribute less than 30% of the inflow to the plant. There is limited or no data relating to trade waste pollutant concentration (e.g. BOD, COD, TSS, Oil and Grease etc). As a result, it was assumed that the strength of the sewage from trade waste customers is the same as the residential flows.

While it is noted that no influent quality monitoring occurs at Baradine STP, the following table provides a summary of plant influent loading data (for 855 EP), based on typical domestic sewage characteristics at ADWF.

Table 2-3: Summary of Plant Influent Data

Analyte	Units	Typical Value	Basis
BOD	kg BOD/day	51.3	60g/EP/day BOD
TSS	kg TSS/day	51.3	60g/EP/day TSS
TN	kg TN/day	10.3	12g/EP/day TN
TP	kg TP/day	4.3	5g/EP/day P

2.2.3 Final Effluent

The results of monitoring of the Baradine STP treated effluent at the licence monitoring point are provided in Table 2-4. There are no concentration limits included in the licence. The EPL requires sampling quarterly during discharge.

Table 2-4: Treated effluent sampling results – Baradine STP EPA point 2 (Discharge to utilisation area)

Sample Date	pH	TSS (mg/L)	TN (mg/L)	TP (mg/L)	Oil and Grease (mg/L)	BOD (mg/L)
02/09/2015	9.0	66	9.2	10.	5	29
02/05/2017	9.2	126	15.2	11	2	18
28/03/2018	9.8	118	14.7	9	6	22

It is noted in the table above that the pH of the effluent is quite high (above 9). Furthermore, the TSS:BOD ratio is also quite high. This typically indicates potential algae overgrowth in the pond system.

3 Background Review

3.1 Summary of Previous Investigations

3.1.1 Connection of Camp Cypress to Baradine STP

The following options have been previously investigated by WSC with respect to connecting Camp Cypress to Baradine STP.

Option 1: Direct Connection to Baradine Sewerage System.

This option includes a direct connection from the facilities at Camp Cypress to the Baradine STP vacuum sewerage system. This would involve a new connection to and extension of the vacuum main at the corner of Lachlan and Naomi Streets where seven (7) new vacuum pots would receive the effluent from Camp Cypress. A schematic of the proposed option is shown in Figure 3-1.

Obtained cost estimates for this option are as follows:

Table 3-1: Cost Estimates for Direct Connection to Baradine STP

Item	Cost Estimate
A rising main and associated connections, including a tank, pumps and pressure line from Camp Cypress to the Lachlan/Naomi Street interface	$238,150
Vacuum Pots (x7) and branch line at the Lachlan/Naomi Street site	$300,000
Total Estimated Project Cost	$538,150

Under this option, the Showground Trust would be required to provide all internal sewerage collection systems, including pumps, tanks and pipework.

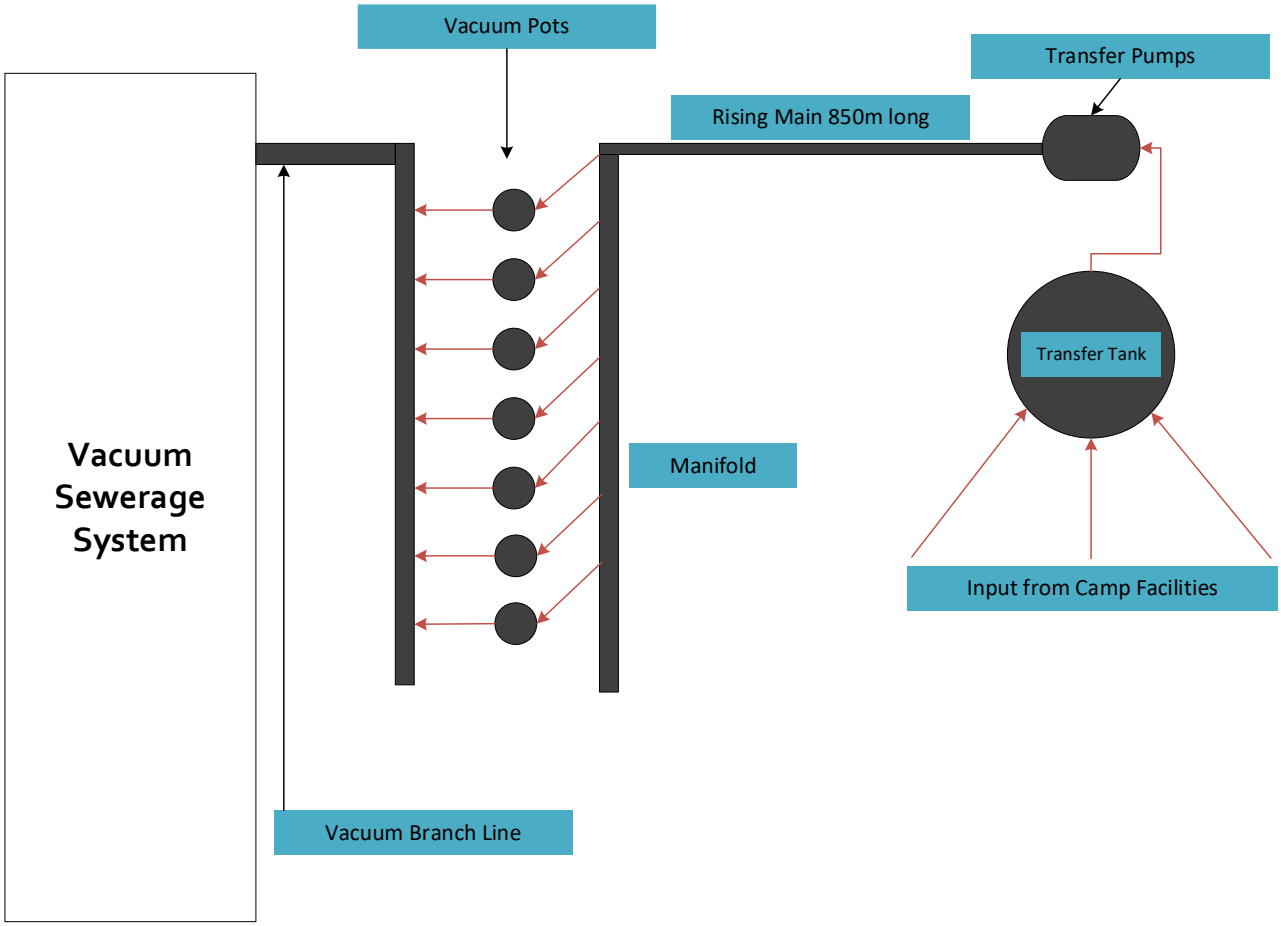

Figure 3-1: Camp Cypress – Proposed Sewer Connection Layout

Option 2: Construct a pipeline directly to the Sewerage Treatment Ponds

In this option, a direct pipeline from Camp Cypress to Baradine STP is proposed. WSC has conducted prior studies including an Ecological Assessment and an Aboriginal Due Diligence Assessment. Based on these prior investigations, it was noted that there are further restraints to be overcome.

The Ecological assessment identified a variety of threatened fauna species as potentially inhabiting or using the habitat along the proposed route – prompting further investigations. To address this issue, an option was to use Council's discretion in applying for an easement within Baradine Common. Another issue was on who would bear the Operating & Maintenance costs for the pipeline. A recommendation was made to apply for an easement. It is not clear whether this application went forward

The Aboriginal Due Diligence identified a few Aboriginal cultural heritage sites, however the site assessment resulted in the conclusion that the sites were not at risk from the proposed pipeline works if proposed management strategies would be followed.

The total project cost for this option was approximately $400,000. Under this option, the Showground Trust would be required to provide all internal sewerage collection systems, including pumps, tanks, and pipework.

Figure 3-2 shows the location of the proposed sewer pipeline connecting Camp Cypress to the Baradine STP.

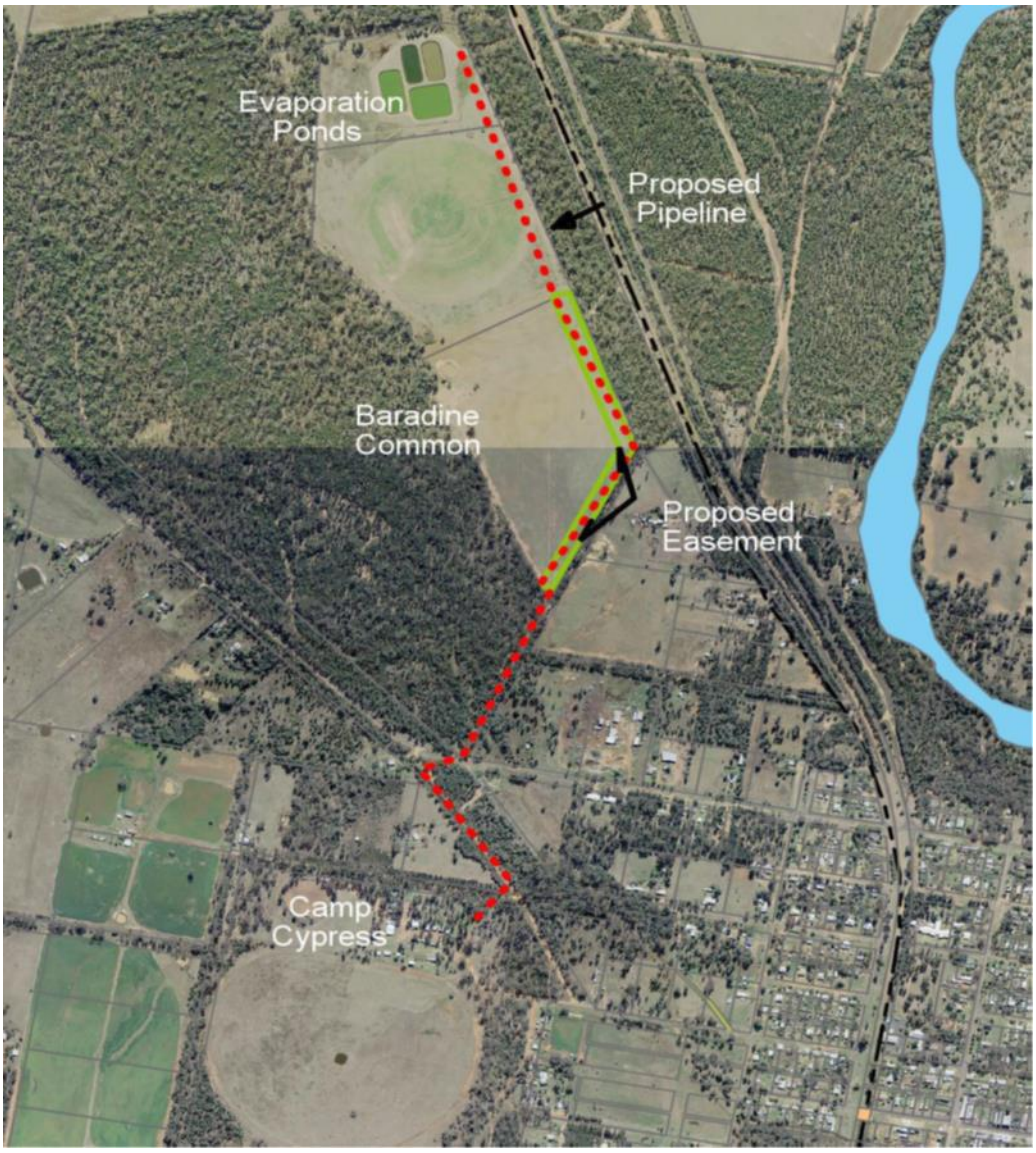

Figure 3-2: Location of Proposed Sewer Pipeline Connecting Camp Cypress to the Baradine STP

CWT is currently investigating typical and peak sewerage generation rates at the Camp and capacity of Baradine STP. This will determine the need to review connection options and update cost estimates.

3.1.2 Previous STP Capacity Assessments

Treatment Capacity

It has been noted that the current performance and capacity of Baradine STP are unknown. In 2019, a high-level assessment was conducted to review the ability of the treatment ponds at Baradine to accept additional loads from the proposed inland rail workers' camp. The assessment was conducted adopting the following dimensions, areas, and volumes for the ponds.

Table 3-2: Pond Description and Dimensions at Baradine STP

Description	L (m)	W (m)	D (m)	A (m^2)	V (m^3)
Facultative Pond 1	100	38	2.1	3,800	7,980

Description	L (m)	W (m)	D (m)	A (m²)	V (m³)
Facultative Pond 2	100	38	1.9	3,800	7,220
Maturation Pond	110	52	1.75	5,720	10,000

The following assumptions were adopted in the previous capacity assessment:

- The storage pond was not included in the capacity assessment
- Residential load was based on the 2016 census figures resulting in an Equivalent Population (EP) of 760
- A non-residential EP of 138 was used for non-residential load
- Hydraulic loading was taken as 240 L/EP/day
- BOD loading was taken as 60 g/EP/day
- Using the residential and non-residential EP estimates, the Average Dry Weather Flow (ADWF) was calculated to be 216 m³/d
- Additional load from the planned inland rail workers camp was taken as 500 EP. This resulted in a total ADWF of 336 m³/d.
- Current volumetric loading rate (2019) was taken as 20 g/m³/d
- Proposed volumetric loading rate was taken as 31 g/m³/d
- Faecal Coliform concentration in the influent was taken 1x10^6 cfu/100 mL
- The minimum average monthly temperature was taken 9.5°C.

The results from the previous capacity assessments are summarised in Table 3-3 below. These results were based on modelling of the system using methodologies developed by Mara and Marais.

Table 3-3: Results from the previous Capacity Assessment (Hunter H2O, 2019)

Parameter	Value	Comment
Modelled performance under current loads		
Combined Surface Area	7,600 m²	Greater than the minimum requirement of 5,735 m² for the minimum average monthly temperature 9.5°C
Retention Time	70 days (facultative) 46 days (maturation)	Good
Facultative Pond 1 effluent unfiltered BOD	Approx. 20 mg/L	This indicates a moderate load on the second oxidation pond
Predicted facultative Pond 2 effluent BOD	Less than 5 mg/L	Acceptable
Maturation pond BOD surface loading rate	Less than 1 kg/ha/d	Acceptable

Parameter	Value	Comment
Modelled performance under proposed loads		
Combined Surface Area	7,600 m²	Less than the minimum requirement of 8,921 m² for the minimum average monthly temperature of 9.5°C
Retention Time	51 days (facultative) 30 days (maturation)	Good
Facultative Pond 1 effluent unfiltered BOD	Approx. 35 mg/L	This indicates a moderate load on the second oxidation pond
Predicted facultative pond 2 effluent BOD	Less than 5 mg/L	Acceptable
Maturation Pond BOD surface loading rate (kg/ha/d)	2.5 kg/ha/d	Acceptable

First order modelling of faecal coliform destruction was undertaken. Based on an influent concentration of 1x10^6 org/100 mL and the retention time in the three ponds, the winter median concentration of ~350 org/100 mL for the current load increased to a median of <1000 org/100 mL. Nematode removal through sedimentation of >25 days was achieved in both the current and proposed conditions.

Based on the modelling performed in the previous investigations, Hunter H2O concluded the following:

- Additional load associated with the inland rail workers' camp would be manageable if connected to the Baradine STP.
- Additional refuse and detritus will increase crust and solids build up at the inlet to the works.
- Any commercial cooking (grease and fats) or laundry operations (detergents, caustic material) associated with the camp may exceed assimilative capacity of impact on the biology of the pond system.
- Sludge and inerts that have accumulated in the ponds over time will reduce the retention time and treatment effectiveness compared to that modelled. As sludge accumulates in the pond system, regular desludging of the inlet zone of ponds 1 and 2 should be undertaken to maintain treatment effectiveness.

3.1.3 Previous Baradine STP Sludge Survey

In 2014, WSC commissioned Oceanic Bio Innovative Water Solutions to conduct a sludge survey at the Baradine Sewerage Ponds . The results obtained are presented below.

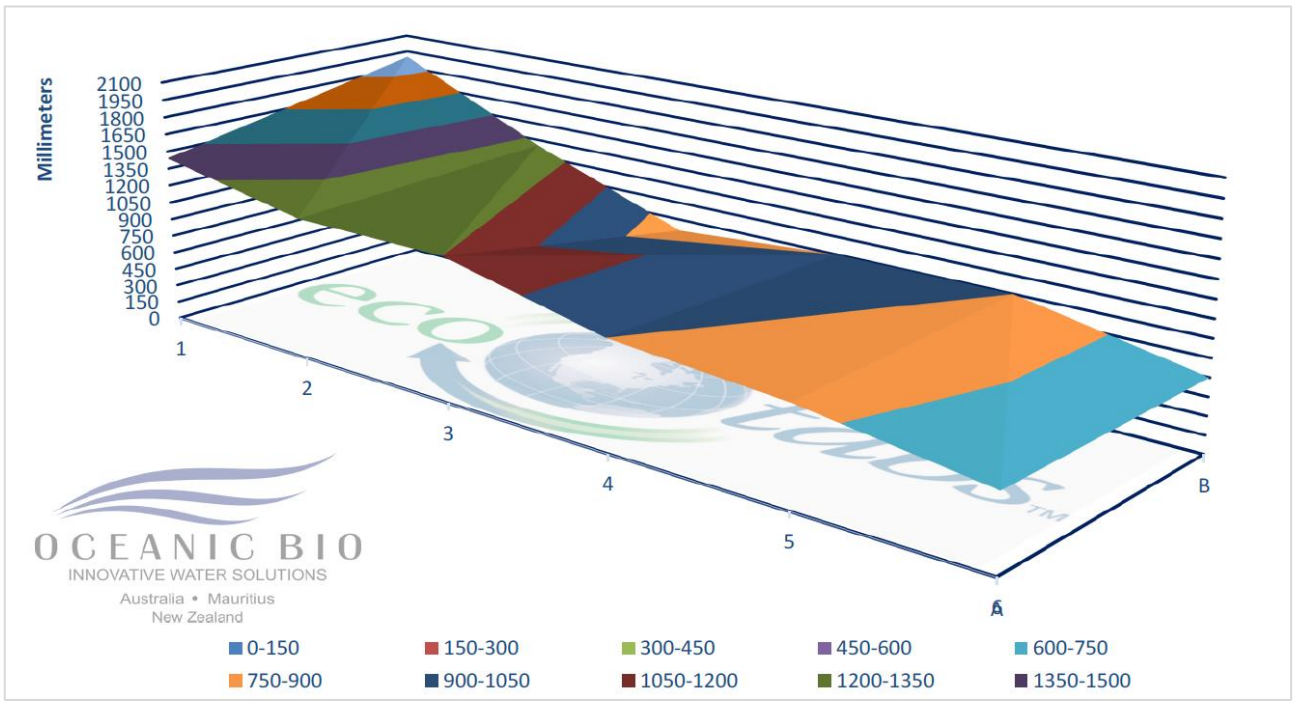

Figure 3-3: Baradine Sludge Survey 28 May 2014

Table 3-4: Baradine STP Sludge Survey 28 May 2014

	1	2	3	4	5	6	Average
Section A							
Pond Depth	**2,500**	**2,500**	**2,400**	**2,400**	**2,100**	**2,100**	**2,333**
Sludge Depth (mm)	1,060	1,300	1,200	1,500	1,300	1,500	1,310
Sludge Thickness (mm)	1,440	1,200	1,200	900	800	600	1,023
Section B							
Pond Depth	**2,500**	**2,500**	**2,400**	**2,400**	**2,100**	**2,100**	**2,333**
Sludge Depth (mm)	600	1,200	1,600	1,500	1,200	1,500	1,267
Sludge Thickness (mm)	1,900	1,300	800	900	900	600	1,067

From the results in Table 3-4, the average total depth was approximately 2,333 mm and the average sludge thickness was 970 mm, indicating that sludge occupied about 41% of the pond depth. It is noted that for optimum operation of waste stabilisation ponds, the volume of sludge in the primary facultative pond

should typically represent 15 – 30% of the total volume of the basin. A filling rate above 30% necessitates desludging[1].

3.2 Site Visit Observations

On 6th October 2020, CWT's Senior Process Engineer – Neville Tawona visited Baradine STP and conducted a site tour of the pump station and the lagoon system. The following issues were noted during the site visit.

Table 3-5: Site Visit Issues

Issue/Item	Description
Baradine STP Pump Station	
Data Collection	During the site visit, it was observed that currently, operational data at the pump station is recorded on paper logs – no digital cataloguing and storage. It is thus difficult to track operational trends of pump cycles.
Control System	There is an onsite control system including a wall mounted PLC for the vacuum tank and vacuum pump systems. There is a current proposed project to install a SCADA system.
Vacuum System	There is a vacuum tank and two vacuum pumps. There are two duty submersible pumps for sewage at the pump station with a duty point of 20L/s each. The capacity of the vacuum system (including vacuum pots, pumps and tank) will need to be assessed for their ability to service potential / future flows and loads in this study.
Odour Issues	There have been numerous odour complaints from the neighbouring residential properties WSC have confirmed that a project to install a new odour bed is currently underway.
Baradine STP Lagoon/Pond System	
Configuration	There are currently four (4) ponds, which include two (2) facultative ponds (Pond 1 and Pond 2), a maturation pond (Pond 3) and a Storage Pond (Pond 4). These ponds are configured in series. Effluent from the storage pond is irrigated at an adjacent site.
Inlet Structure	Some trash was seen at the inlet box. Visual inspection of the inlet structure indicated potential sulphate and chloride attack on the concrete wall. Refurbishing and/or replacement could be required.
Pond Appearance	Sewage appeared to have a green colour in all ponds except Pond 1. This typically indicates an algal bloom potentially due to long detention times. pH and TSS:BOD ratio will likely be high (this will be verified through tests). Old sludge which has built up over the years will need to be removed. Tall weeds were also observed in Pond 2 and Pond 3. Pond maintenance is thus critical because tall weeds can stop the wave action when wind is blowing, which would limit treatment capacity.
Effluent Irrigation	It was noted that effluent is irrigated on adjacent land. Irrigation schedules and irrigation pump capacity need to be understood to determine overall detention time of sewage in the ponds.
Environmental Compliance	There are currently no concentration / load limits imposed by the EPL (EPL No. 5950) with respect to effluent irrigation at Baradine STP discharge location. There is a volume limit

[1] Picot B et al., 2005

	only. Furthermore, we understand that WSC and the EPA have had prior discussions regarding surrendering the EPL 5950. For sustainable effluent management, WSC would need to have internal targets based on best practice sewage treatment practices. Classification of effluent as low, medium or high strength could be conducted as part of an ongoing irrigation management plan to mitigate environmental risks associated with effluent irrigation, runoff and establish sustainable discharge controls.
Camp Cypress	
Existing Sewerage System	Currently, Camp Cypress has a septic tank system to manage sewage onsite. Based on discussions with Camp Management, there are numerous occasions whereby the septic tank storage does not cope with sewage generation. The current storage capacity is unknown. The interim strategy implemented at Camp Cypress to cope with overflows is to use a liquid waste contractor to pump out the septic tanks for transport of sewage to an offsite disposal facility.
Number of Visitors	The number of visitors at the Camp provided to CWT is quite variable. This presents a major data gap which creates problems in assessing additional treatment capacity required. Furthermore, growth in the number of visitors to Camp Cypress is anticipated in the future and as a result, sewage treatment capacity is a limiting factor that needs to be addressed. There is a need for more data collected over at least 5 years to determine visitor trends and peak periods. It was proposed during the workshop to analyse water usage data at the Camp from Council records to estimate sewage generation rates.
Inland Rail Project	
Number of Employees	Available data indicates that the inland rail project will attract around 500 employees for the duration of the project.
Duration of project	The duration of the project will need to be confirmed. There are still some uncertainties regarding details for the inland rail project. For example, at the time of workshop 1, the identity of the proposed contractor was still unknown. Assumptions for assessing the ability of Baradine STP to accept additional wastewater loads will be confirmed with WSC.

4 Assessment of STP Capacity

The assessment of Baradine STP capacity included the following key steps:

- Detail current demand and forecast future demand
- Assess asset capacity (current and planned) to treat loads ensuring compliance to regulated product specifications and licenses (where applicable)
- Identify shortfalls in treatment capacity to service growth while maintaining compliance including the timing of these shortfalls.
- Identify the required treatment plant augmentations and provide cost estimates where applicable

4.1 Population and Load Projections

Growth demand assessment was assessed for Baradine catchment and was derived by projecting:

- Growth in residential population

- Change in existing non-residential sources where applicable
- Future additional non-residential demand.

This was used to develop the following scenarios that were further assessed:

Table 4-1: Growth Scenarios Assessed

Scenario	Description
Scenario 1	This is a business as usual (BAU) scenario whereby current sewage treatment will continue, and the only growth in the Baradine catchment will be from additional residential connections as per Council's planning priorities (as forecast in the IWCM strategy).
Scenario 2	This scenario will include: ▲ Current sewage treatment ▲ Growth from future additional residential connections as per Council's planning priorities (as forecast in the IWCM strategy) ▲ Additional wastewater from Camp Cypress
Scenario 3	This scenario will include: ▲ Current sewage treatment ▲ Growth from future additional residential connections as per Council's planning priorities (as forecast in the IWCM strategy) ▲ Additional wastewater from the Inland Rail Project
Scenario 4	This scenario will include: ▲ Current sewage treatment ▲ Growth from future additional residential connections as per Council's planning priorities (as forecast in the IWCM strategy) ▲ Additional wastewater from Camp Cypress ▲ Additional wastewater from the Inland Rail Project

4.1.1 Scenario 1 – BAU Sewage Treatment at Baradine

Residential growth was defined as the increase in the numbers of sewer connections in the Baradine Catchment. Number of sewer connections were provided in the IWCM Strategy for 2018, 2028, 2038 and 2048. These were used in conjunction with a household occupancy ratio of 2.4 to determine the equivalent population served.

Non-residential growth was based on data provided by WSC on Trade Waste Dischargers.

The total sewage flows calculated is presented in Table 4-2 below.

Table 4-2: Baradine Catchment Growth Projection

Parameter	Units	2020	2024	2028	2038	2048
Equivalent Population (Total)	EP	855	862	869	886	905
ADWF	m^3/d	205	207	209	213	217
PDWF	m^3/d	506	507	513	522	532
PWWF	m^3/d	821	828	834	851	869

Based on the total flows to the STP presented in Table 4-2, the following table shows the biological loads to the Baradine STP with respect to BOD.

Parameter	Units	2020	2024	2028	2038	2048
BOD	kg/d	51	52	52	53	54

4.1.2 Scenario 2 – BAU + Growth from Camp Cypress

This scenario will still include flows and loads to Baradine STP based on current and future additional connections as presented in section 4.1.1 and additional flows and loads from Camp Cypress.

Appendix B presents the estimated maximum daily wastewater flow from the Camp Cypress.

Table 4-3 BAU + Camp Cypress Growth Projection

Parameter	Units	2020	2024	2028	2038	2048
Equivalent Population (Total)	EP	1054	1061	1068	1085	1104
ADWF	m³/d	253	255	256	260	265
PDWF	m³/d	697	698	704	713	723
PWWF	m³/d	950	956	963	980	998

4.1.3 Scenario 3 – BAU + Growth from Inland Rail Project

This scenario will still include flows and loads to Baradine STP based on current and future additional connections as presented in section 4.1.1 and additional flows and loads from the proposed inland rail project. The timing for the inland rail project is currently not known, however for purposes of this study, it was assumed that the project will commence in 2021 and end in 2024.

Table 4-4 BAU + Inland Rail Project Growth Projection

Parameter	Units	2020	2024	2028	2038	2048
Equivalent Population (Total)	EP	1355	1362	869	886	905
ADWF	m³/d	325	327	209	213	217
PDWF	m³/d	986	987	513	522	532
PWWF	m³/d	1121	1128	834	851	869

4.1.4 Scenario 4 – BAU + Growth from Camp Cypress and Inland Rail Project

This scenario will still include flows and loads to Baradine STP based on current and future additional connections as presented in section 4.1.1 and additional flows and loads from Camp Cypress and the proposed inland rail project.

Table 4-5 BAU+ Camp Cypress + Inland Rail Project Growth Projection

Parameter	Units	2020	2024	2028	2038	2048
Equivalent Population (Total)	EP	1554	1561	1068	1085	1104
ADWF	m³/d	373	375	256	260	265
PDWF	m³/d	1177	1178	704	713	723
PWWF	m³/d	1250	1256	963	980	998

4.2 Estimated STP Capacity Vs Different Growth Scenarios

The Baradine STP has an assessed treatment capacity of 1268 EP (See Appendix C for Capacity Assessment Calculation). Assessment uses the mean temperature of the air in the coldest month. Higher temperatures will improve the STP's capacity to handle the higher organic loadings.

Following Figure 4-1 indicated that the STP has enough capacity to treat the wastewater from Baradine under different growth scenarios until 2048.

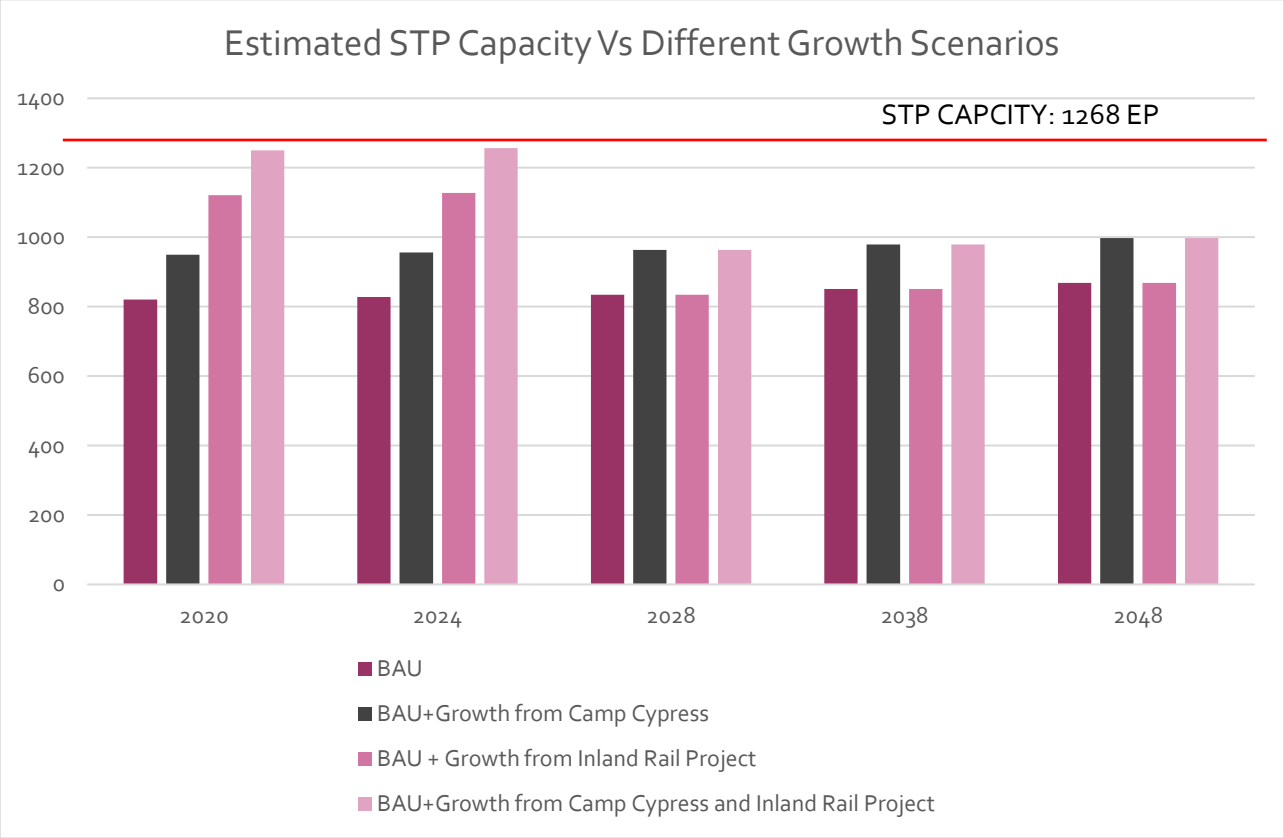

Figure 4-1 Estimated STP Capacity Vs Different Growth Scenarios

5 Discussion and Recommendations

The Baradine STP has an assessed treatment capacity of 1268 EP. Assessment uses the mean temperature of the air in the coldest month. Higher temperatures will improve the STP's capacity to handle the higher organic loadings.

The total wastewater generation per day from the non-residential sources (see Appendix A) is estimated to be 58.1 kL (242 EP).

The maximum wastewater generation on Showground Day from the Camp Cypress (see Appendix B) is estimated to be 47.7 kL (199 EP).

The Camp Cypress water meter readings (from 2006-2020) indicate that the average daily water usage at Camp Cypress is 3.75 kL/d (Note: usage can be significantly high on Showground Day). Annual wastewater generation from the Camp Cypress is estimated to be 1,027 kL assuming 75% of water ends up in sewer. With the annual net evaporation rate of 1500 mm, if suitable land size and location are available, existing septic tanks followed by an evaporation pond is a low maintenance option that should be considered for zero liquid discharge.

The Scenario 1- Baradine catchment growth projection Table 4-2 suggests that the STP has enough capacity to treat the wastewater from Baradine until 2048.

The Scenario 2- BAU+ Camp Cypress growth projection Table 4-3 suggests that the STP has enough capacity to treat the combined wastewater from Baradine and Camp Cypress until 2048. This Scenario assumed the maximum wastewater generation per day from Camp Cypress is 47.7 kL (199 EP) and remain unchanged until 2048.

The Scenario 3- BAU + Inland Rail Project growth projection Table 4-4 suggests that the STP has enough capacity to treat the combined wastewater from Baradine and Inland Rail Project camp.

The Scenario 4- BAU + Camp Cypress+ Inland Rail Project growth projection Table 4-5 suggests that the STP has enough capacity to treat the combined wastewater from Baradine, Camp Cypress, and Inland Rail Project camp. However, there is a chance of STP overloading during inland rail project period.

The immediate solution for the Scenario 4 is to increase organic treatment capacity by placing the aerator(s) close to the inlet zone of the primary facultative pond, where the oxygen demand is higher to maintain a minimum of 1 mg/L DO throughout the pond at the heaviest loading periods. Aerator/mixer can also reduce the odour and algae issues. However, the manufacturers' data should be consulted with relation to the recommended pond depth, area covered by each aerator, oxygen transfer efficiency, etc. Typical 7.5 kW aerator/mixer can cover approximately 1,500-2,000 m^2 aera for oxygenation. 2 (Two) aerators x 7.5 kW ($50,000 each) will be required to cover the primary facultative pond. Design, supply and install cost for the stand-alone automatic aeration system including 2 x aerators and a DO sensor is estimated to be $150,000 assuming power is readily available onsite. Hire option is available ($920/week/aerator) but not economically feasible for the long-term use. In the long term, a pre-treatment program with collection system monitoring of the areas suspected of introducing high organic shock loads should be developed and implemented.

Because of the number of assumptions necessary in determining the Baradine STP capacity and the likely required EP for the town growth, and inclusion of Camp Cypress and the Inland Rail Project sewage, a staged approach to the problem(s) is recommended.

- The primary facultative pond sludge survey indicated that the net pond volume is substantially reduced. It is recommended that the accumulated sludge from the primary facultative pond must be removed. (Note: The sludge should be removed when the sludge reaches a thickness that can be affected by the aerators, or usually when the sludge reaches 1/3 of the pond depth.)
- Install inlet flowmeter, manually raked coarse bar screen (15 mm openings between each bar) and the grit channel at the inlet to prevent future sludge accumulation.
- Implement a weekly monitoring program as described in Table 2-2 Use the data to determine how the plant is performing and whether it is approaching being overloaded. At the same time, once the data becomes available, repeat the analysis of the current capacity.
- Investigate options for in situ treatment of Camp Cypress waste.
- Trial recirculation of algal laden, DO rich water from the maturation or storage pond and monitor the performance of the first facultative pond including the generation of odour.
- Establish contact with a company that can provide aerators at short notice.
- Increase existing EPL limit of 85 kL/d to 250 kL/d to match the potential discharge volume of STP

Appendix A Wastewater Flowrates from Non-Residential Sources

Name of Business	Facility Type	Unit	Value	Flow, L/Unit/day		Daily Wastewater Generation (L)
				Range	Typical	
Ahmedi's IGA	Shopping Center	Employee	8	26-49	38	304
PharmaSave Baradine Pharmacy	Office	Employee	2	26-61	49	98
The Lott	Retail	Employee	2	26-61	49	98
The Embassy Baradine	coffee shop	Customer	30	15-30	23	690
		Employee	3	30-45	38	114
Baradine Rural Supplies	Shopping Center	Employee	5	26-49	38	190
Baradine Surgery	Hospital, Medical	Employee	2	19-57	38	76
Pilliga Forest Discovery Centre	Visitor Center	Visitor	20	15-30	19	380
Baradine Hotel	Hotel	Guest	15	150-230	190	2850
		Employee	5	30-49	38	190
TAB	Office	Employee	2	26-61	49	98
Baradine Multi-Purpose Service	Hospital, Medical	Bed	45	470-910	630	28350
		Employee	10	19-57	38	380
Baradine Central School	School, day-only with canteen	Student	120	38-76	57	6840
		staff	30	26-61	49	1470
Warrigal Gardens Bed and Breakfast	Hotel	Guest	4	150-230	190	760
Casey's Corner	coffee shop	Customer	50	15-30	23	1150
		Employee	2	30-45	38	76
Baradine Police Station	Office	Employee	5	26-61	49	245

Bowling Club & Squash Courts	Bowling alley	alley	7	570-950	760	5320
St John's Catholic Primary School	School, day-only with canteen	Student	38	38-76	57	2166
		staff	12	26-61	49	588
Australia Post	Office	Employee	2	26-61	49	98
Tattersalls Hotel	Hotel	Guest	10	150-230	190	1900
		Employee	3	30-49	38	114
NSW AMBULANCE	Office	Employee	2	26-61	49	98
ASM mechanical	Automobile service station	Vehicle served	3	30-57	45	135
		Employee	3	34-57	49	147
Forestry corporation of NSW	Office	Employee	5	26-61	49	245
Baradine library		Employee	1	30-45	38	38
Memorial swimming pool		Customer	10	19-45	38	380
		Employee	1	30-45	38	38
Emmy Lou's Eatery	coffee shop	Customer	50	15-30	23	1150
		Employee	2	30-45	38	76
The Embassy	coffee shop	Customer	50	15-30	23	1150
		Employee	2	30-45	38	76
				Total Wastewater Generation (L/d)		58,078
					Equivalent Population	242

Appendix B Estimated Wastewater Flowrates from Camp Cypress during Showground Day

Name of Business	Facility Type	Unit	Value	Flow, L/Unit/day		Daily Wastewater Generation (L)
				Range	Typical	
Camp Cypress Accommodation and Facilities	Cabin, Resort	Person	92	30-190	150	13800
	Dining hall	meal served	200	15-38	26	5200
	Trailer camp	Trailer	50	280-570	470	23500
	Fairground	Visitor	600	4-8	8	4800
		Employee	10	30-45	38	380
				Total Wastewater Generation (L/d)		47,680
				Equivalent Population		199

Appendix C Capacity Assessment Calculation

Assumptions

The following assumptions are adopted in the capacity assessment:

- Hydraulic loading: 240 L/EP/day
- BOD loading: 60 g/EP/day
- Influent total BOD: 250 mg/L
- Faecal Coliform concentration in the influent: 1x10^6 cfu/100 mL
- Helminth eggs concentration in the influent: 100 eggs/L
- The lowest monthly mean air temperature: 10°C
- Flow regime: Dispersed
- Annual rainfall: 500 mm
- Annual evaporation: 2000 mm
- All ponds are completely de-sludged.

Facultative & Maturation Ponds

Proposed by Mara (1997) the pond sizing equation uses the mean temperature of the air in the coldest month. The reason for using the mean temperature of the air is that, in the cold period, a safe value is obtained since the temperature of the water will be slightly higher.

The temperature data for the period of 2009-2020 indicated that the lowest monthly mean air temperature at Baradine was 10 °C in July 2011,2014 & 2015[2].

Equivalent Population

The surface loading rate of the facultative pond can be estimated using following equation.

$$L_s = 350 \times (1.107 - 0.002 \times T)^{(T-25)}$$

Where:

L_s=Surface loading rate (kgBOD_5/ha.d)

T=Mean air temperature in the coldest month (°C)

$$L_s = 350 \times (1.107 - 0.002 \times T)^{(T-25)}$$

$$L_s = 350 \times (1.107 - 0.002 \times 10)^{(10-25)}$$

$$L_s = 100.14$$

The area required for the facultative pond can be calculated as a function of the surface loading rate L_s.

$$A = \frac{L}{L_s}$$

[2] *https://www.worldweatheronline.com/lang/en-au/baradine-weather-averages/new-south-wales/au.aspx*

Where:

A= Area required for the pond (ha)

L= Influent total BOD (kgBOD_5/d)

L_s=Surface loading rate (kgBOD_5/ha.d)

The total area of existing facultative ponds is 7,600 m² (0.76 ha). Hence., the influent total BOD of the facultative ponds can be estimated as follows:

$$L = A \times L_S = 0.76 \times 100.14 = 76.1$$

The estimated equivalent population (EP) is:

$$EP = \frac{L \times 1000 \frac{g}{kg}}{60 \frac{g}{EP.d}} = \frac{76{,}109}{60} = 1268$$

Detention Time

The detention time of the facultative ponds can be estimated as follows:

$$t = \frac{V}{Q} = \frac{V}{EP \times 0.24} = \frac{(7980 + 7220)}{1268 \times 0.24} = 49.9\ d$$

The detention time required for the oxidation of the organic matter varies with the local conditions, especially the temperature. The lower detention time required in the area where the influent temperature is higher. Typical design detention time for facultative pond is 15-45 days.

The detention time of the maturation pond can be estimated as follows:

$$t = \frac{V}{Q} = \frac{V}{EP \times 0.24} = \frac{10000}{1268 \times 0.24} = 32.9\ d$$

The detention time in a maturation pond is a function of the pond shape and the required coliform removal efficiency. Minimum detention time of 3 days is required to avoid short circuiting and the washing-out of algae. Typical design detention time for maturation pond is 10-20 days.

Where:

t = Detention time (d)

V = Pond volume (m^3)

Q = Influent flow (m^3/d)

Hydraulic loading = 240 L/EP/day = 0.24 m^3/EP/day

BOD Removal in Facultative Ponds

Dispersed flow regime adopted in the following calculation.

Dispersion number $d = \frac{1}{\frac{L}{B}} = \frac{1}{\frac{100}{38}} = 0.38$

Where:

d= Dispersion number

L= Length of the facultative pond (m)

B= Breath of the facultative pond (m)

The value of BOD removal coefficient at 20 °C can be obtained using following equation.

$K(\text{dispersed flow}) = 0.091 + 2.05 \times 10^{-4} \times L_s = 0.091 + 2.05 \times 10^{-4} \times 100.14 = 0.11 d^{-1}$

Where:

L_s= Surface loading rate (kgBOD_5/ha.d)

The value of BOD removal coefficient at 10 °C can be calculated as follows:

Correcting *K* for 10 °C:

$$K_{10} = K_{20} \times \theta^{(T-20)} = 0.11 \times 1.07^{(10-20)} = 0.22 d^{-1}$$

Where:

Θ= Temperature coefficient[3] = 1.07

The effluent BOD concentration from the facultative ponds is:

$$a = \sqrt{1 + 4 \times K_{10} \times t \times d} = \sqrt{1 + 4 \times 0.22 \times 49.9 \times 0.38} = 4.2$$

$$S_e = S_i \frac{4 \times a \times e^{\frac{1}{2d}}}{(1+a)^2 \times e^{\frac{a}{2d}} - (1-a)^2 \times e^{-\frac{a}{2d}}} = 250 \frac{4 \times 4.2 \times e^{\frac{1}{2 \times 0.38}}}{(1+4.2)^2 \times e^{\frac{4.2}{2 \times 0.38}} - (1-4.2)^2 \times e^{-\frac{4.2}{2 \times 0.38}}} = 2\ mg/L$$

Actual effluent BOD is expected to be higher than calculated value because of presence of algae. Each 1 mg of algae generates a BOD_5 around 0.45 mg. The suspended solids from facultative ponds are about 60-90% algae. The effluent BOD from the facultative ponds is the influent concentration to the maturation pond.

The BOD removal efficiency in the facultative ponds is:

$$E = \frac{S_i - S_e}{S_i} \times 100 = \frac{250 - 2}{250} \times 100 = 99.1\%$$

BOD Removal in Maturation Pond

The main objective of maturation pond is the removal of pathogens. However, maturation pond can provide additional polishing of BOD, although this is usually limited to only 10-25%.

Helminth Eggs Removal

The concentration of Helminth Eggs (HE) in the effluent from the waste stabilisation pond system will be estimated with the following assumptions:

Equivalent Population = 1268 inhab

Influent flow = 304 m^3/d

Concentration of HE in the raw sewage, C_i = 100 eggs/L

Hydraulic detention time in facultative ponds, *t* = 49.9 day

Hydraulic detention time in maturation ponds, *t* = 32.9 day

[3] *Sperling, M. V., "Waste Stabilisation Ponds: Biological Wastewater Treatment Series, Volume 3", 1st Edition, IWA publishing (2007)*

The HE removal efficiency in the facultative ponds can be estimated as follows:

$$E = 100 \times \left[1 - 0.41e^{(-0.49t + 0.0085t^2)}\right] = 100 \times \left[1 - 0.41e^{(-0.49 \times 49.9 + 0.0085 \times 49.9^2)}\right] = 98.47\%$$

The concentration of HE in the effluent of facultative ponds is:

$$C_e = C_i \times \left(1 - \frac{E}{100}\right) = 100 \times \left(1 - \frac{98.47}{100}\right) = 1.53\ eggs/L$$

The effluent from the facultative ponds do not comply with the national *guideline for sewerage systems-use of reclaimed water* quality of less than or equal to 1 egg per litre to protects crop consumers.

The HE removal efficiency in the maturation pond can be estimated as follows:

$$E = 100 \times \left[1 - 0.41e^{(-0.49t + 0.0085t^2)}\right] = 100 \times \left[1 - 0.41e^{(-0.49 \times 32.9 + 0.0085 \times 32.9^2)}\right] = 99.96\%$$

The concentration of HE in the effluent of maturation pond is:

$$C_e = C_i \times \left(1 - \frac{E}{100}\right) = 1.53 \times \left(1 - \frac{99.96}{100}\right) = 6.12 \times 10^{-4}\ eggs/L$$

In practical terms, this value corresponds to a HE concentration of zero in the maturation pond effluent.

Condition Assessment of Existing Ground Water Bores

PREPARED FOR

Orana Water Utilities Alliance
Warrumbungle Shire Council

PREPARED BY Access Environmental Planning

January 2021

ACCESS ENVIRONMENTAL PLANNING

QCSE Quality Certified System ISO 9001
QCSE Environmental Certified System ISO 14001
QCSE Safety Certified System ISO 45001

Local Government PROCUREMENT APPROVED CONTRACTOR

ACCESS ENVIRONMENTAL PLANNING

Proponent	*Orana Water Utilities Alliance*		
Client	*Mid-Western Regional Council*		
Purchase Order No			
Document Description	*Condition Assessment of Existing Ground Water Bores*		
	Name	*Signed*	*Date*
Clients Reviewing Officer			
Clients representative managing this document		*Person(s) managing this document*	
		Author Michaela Burns & Greg Brereton *Reviewed by Christopher Botfield, Renae Hill* *Approved by Christopher Botfield, Renae Hill*	
Location			
Document Status Draft		*08/02/2021*	
Draft V1.0 Author to Editor Access EP 1st Internal edit		*20/11/2020*	
Draft V2.0 Report Draft for release for comment to client (Client edit and return)		*16/12/2020*	
Second internal review and client comment		*19/01/2021*	
FINAL once latest version of draft approved by client		*10/02/2021*	
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Clause 125 of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) permits development, on any public reserve land managed by or vested in the Council, for the purpose of a water supply system to be carried out by or on behalf of the Council without consent.

As this report is an assessment of ground water bores for Local Government Areas, it falls under the provisions of ISEPP and can be assessed under Part 5 of the EP&A Act.

Part 5.1 of the EP&A Act requires the determining authority to examine and take into account, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the proposed activity. Clause 228 (2) of the EP&A Regulation sets out the environmental factors that must be considered in relation to the assessment of the proposal's impacts.

This assessment indicates no environmental or legislative impediments to ongoing maintenance, replacement or improvements to equipment at each bore, assuming adherence to normal Council policy and procedure.

This report is hereby accepted by Council in fulfilment of the requirements of Part 5 of the EP&A Act and will remain valid for two years from the date of final acceptance by Council.

Delegated Officer for the Orana Water Utility Alliance

Introduction

The Orana Water Utility Alliance (OWUA) has engaged Access Environmental Planning (Access EP) to complete an assessment for town water supply bore(s) for four Local Government Areas (LGA), the Council areas assessed were: Warrumbungle, Central Darling, Warren and Walgett Shire Councils (Council). This project was initiated as a result of water shortages experienced during the recent drought, the need for water surety and expressed concern regarding the information available for each bore(s).

This report covers both Stage 1 and Stage 2 as requested by OWUA to present an in-depth assessment and risk rating for each bore. Access EP performed an assessment of the bore performance based on current information gathered from the councils, creating a risk assessment and ranking system to inform decision making on potential repairs and new infrastructure required.

Field visits were performed by Access EP staff in 2020 to gather further information regarding the accessibility of the site, condition of the bore and other issues. These observations further informed the risk ranking system of the bores. In addition to the field investigation, AHIMS and BioNet searches have been completed, giving an overview of the potential threatened species and the occurrence of Aboriginal heritage. Drawing attention to the potential impact work on these sites may have.

This risk ranking system has been based on: the date of construction, diameter of the bore, cementing method, geological strata, pump diameter and yield, water quality, bore casing and pump condition, drawdown data and long-term performance of the bore, monitoring regime for each bore and aquifer characteristics.

Stage 1 of this project included a review of current records obtained from council and the Office of Water to create an initial risk assessment based on this preliminary data. Stage 2 involved gathering more information from outside sources and undertaking site visits to generate a more thorough understanding of the condition of the bore and its order of priority for maintenance, repairs or replacement. This has added additional information to the initial risk assessment of each bore. Stage 3, in-depth field investigations, has not been addressed as the risk assessment and rating in this report will be used to inform what field measurements are required.

This report has been generated to give a thorough understanding of the current condition of water bores used by LGAs under OWUA. It also recommends maintenance and monitoring programs and advises on the urgency of repairs or replacement. It provides an understanding of correct and current maintenance programs that will ensure the longevity of the bore and surety of water supply.

Executive Summary

The proposal

Orana Water Utilities Alliance (OWUA) has commissioned Access Environmental Planning (Access EP) to undertake a bore condition assessment across four Local Government Areas (LGAs), including 15 towns with 31 individual bore sites.

This report provides results for Stage 1 and 2 of the project which includes a desktop study of all available records from the NSW Government and Councils on each bore, to provide an initial risk assessment of the bore. A field visit to each bore site was then undertaken and discussions with Council staff on any other bore information or performance records available followed by review and risk assessment.

The ultimate outcome is a series of recommendations on which bores are high risk and require further investigations including camera or downhole geophysical investigation of casing condition, chemical treatment for iron hydroxide and whether pump testing of bores performance is required.

Table 1: Bores selected by Councils for assessment.

Council/LGA	Bore Location	Number of bores to be assessed
Central Darling	Wilcannia	3
	Ivanhoe	2
Walgett	Walgett	2
	Lightning Ridge	2
	Burren Junction	1
	Rowena	1
	Carinda	1
Warren	Warren	6
	Nevertire	2
Warrumbungle	Coonabarabran	5
	Coolah	4
	Dunedoo	1
	Baradine	2
	Bugaldie	1
	Kenebri	1
		Total: 34

Generic Guide for Maintenance of all Bores

When exploring the options for maintenance and repairs of bores it has been taken into account the fact that many LGA's have not had the capacity, means or need to undertake these measures unless urgently required. Remote councils often experience staff shortages and high rates of staff turnover which causes minor maintenance work, like regular monitoring of a well functioning bore, to be overlooked until water shortages such as those experienced in the last four years, occur.

With the limiting factors taken into consideration, suggested maintenance regimes should streamline processes, ensure reliable records are kept and ensure water security. Many of bores the have been

recommended to have camera inspections performed. While this process has many positive attributes and can be informative about the condition of the well, it must be taken into consideration against the cost of new infrastructure. This will be a particular issue with older bores as they will often have undetected faults and the cost of a camera inspection will be comparable to constructing a new bore.

Priority should be given to transition all bore pumps within the OWUA, or at least within each LGA, to one reputable pump manufacturer as this will standardise and streamline the process when pump maintenance is required. A limiting factor faced within this project was the inability to access information about these bores. It would be in the interest of each council to develop a centralised cooperative for data collection regarding licensing and maintenance that is managed by one central entity and will ensure information is organised and accessible for future use.

For town water supplies a preventative maintenance monitoring schedule is recommended. The frequency of monitoring will depend on the specific council's ability to access alternative water supplies should the bore fail and whether the bore is pumping near the capacity of the aquifer. There is a generic guide on the monitoring process including the suggested frequency of monitoring for a town water bore. The actual frequency needs to be tailored to meet the needs of each individual bore.

Discussion

This report will give those responsible for the operation of bores an understanding of the importance of correct monitoring and regular assessment of pumps and column condition. These practices will maximise efficiency and longevity of bores.

In addition to the field investigation, AHIMS and BioNet searches have been completed, giving an overview of the potential threatened species and the occurrence of Aboriginal heritage. Drawing attention to the potential impact work on these sites may have. It has been found that no Aboriginal Heritage or potential threatened species will be impacted through any work.

Depending on bore design flow rate, drawdown and water quality should be monitored at regular intervals. Ideally these protocols should occur quarterly or at least annually. The monitoring can identify potential problems in bore performance and can help determine why the bore performance has deteriorated. It will also assist in the management and collection of more accurate records.

Glossary of Terms and Abbreviations

Term	Meaning
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
BC	Act Biodiversity Conservation Act 2016
CEMP	Construction Environmental Management Plan
CLM	Act Crown Land Management Act 2016
CMP	Conservation Management Plan
DAWE	Department Agriculture, Water and the Environment
DPIE	Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement

EMP	Environmental Management Plan
EP&A	Act Environmental Planning and Assessment Act 1979
EP&A	Reg Environmental Planning and Assessment Regulation 2000
EPA	Environment Protection Authority
EPBC	Act Environment Protection and Biodiversity Conservation Act 1999
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
FM	Act Fisheries Management Act 1994
GAB	Great Artesian Basin
ISEPP	State Environmental Planning Policy Infrastructure 2007
KTP	Key Threatening Processes
LEP	Local Environmental Plan
LGA	Local Government Area
MG/L	Milligram per Litre
NES	National Environmental Significance
NP&W	Reg National Parks and Wildlife Regulation 2009
NP&W	Act National Parks and Wildlife Act 1974
NRAR	Natural Resources Access Regulator
NT Act	Commonwealth Native Title Act 1993
POEO	Protection of the Environment Operations Act 1997
REF	Review of Environmental Factors
REP	Regional Environmental Plan
RF	Act Rural Fires Act 1997
RO	Reverse Osmosis
SCA	State Conservation Area
SEPP	State Environmental Planning Policy
SS	Stainless Steel
SWL	Standing Water Line
TfNSW	Transport for NSW
TSR	Travelling Stock Route (or Reserve)
WARR	Act Waste Avoidance and Resource Recovery Act 2001
WHS	Work Health and Safety Act 2011
WHS MaPS Act	Work Health and Safety (Mines & Petroleum Sites) Act 2013

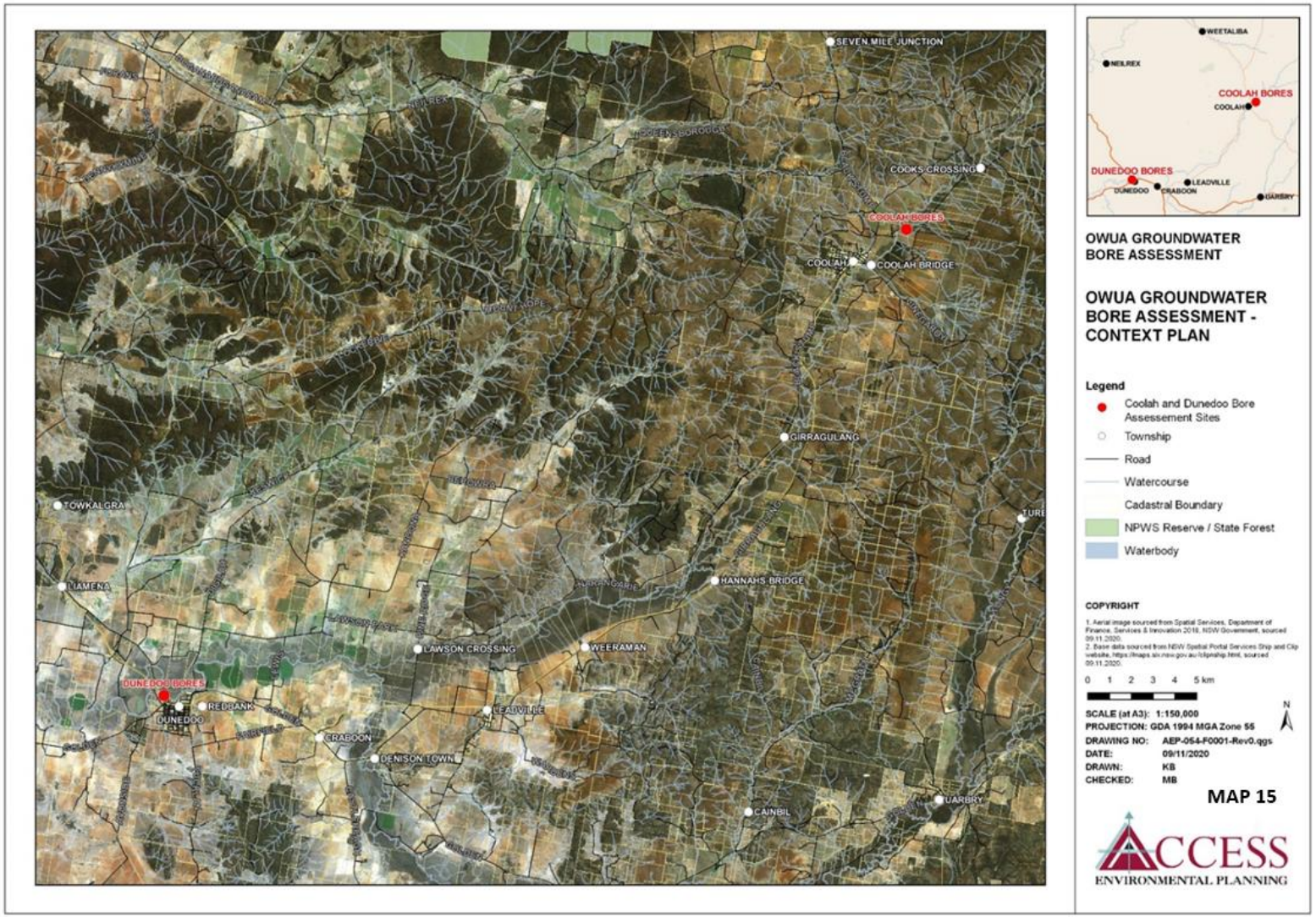
Note: DPIE Superseded Office of Environment and Heritage (OEH), July 2019

TfNSW	Superseded Roads and Maritime Services (RMS), December 2019

Any reference to OEH and RMS in the document relate to published documents or existing databases.

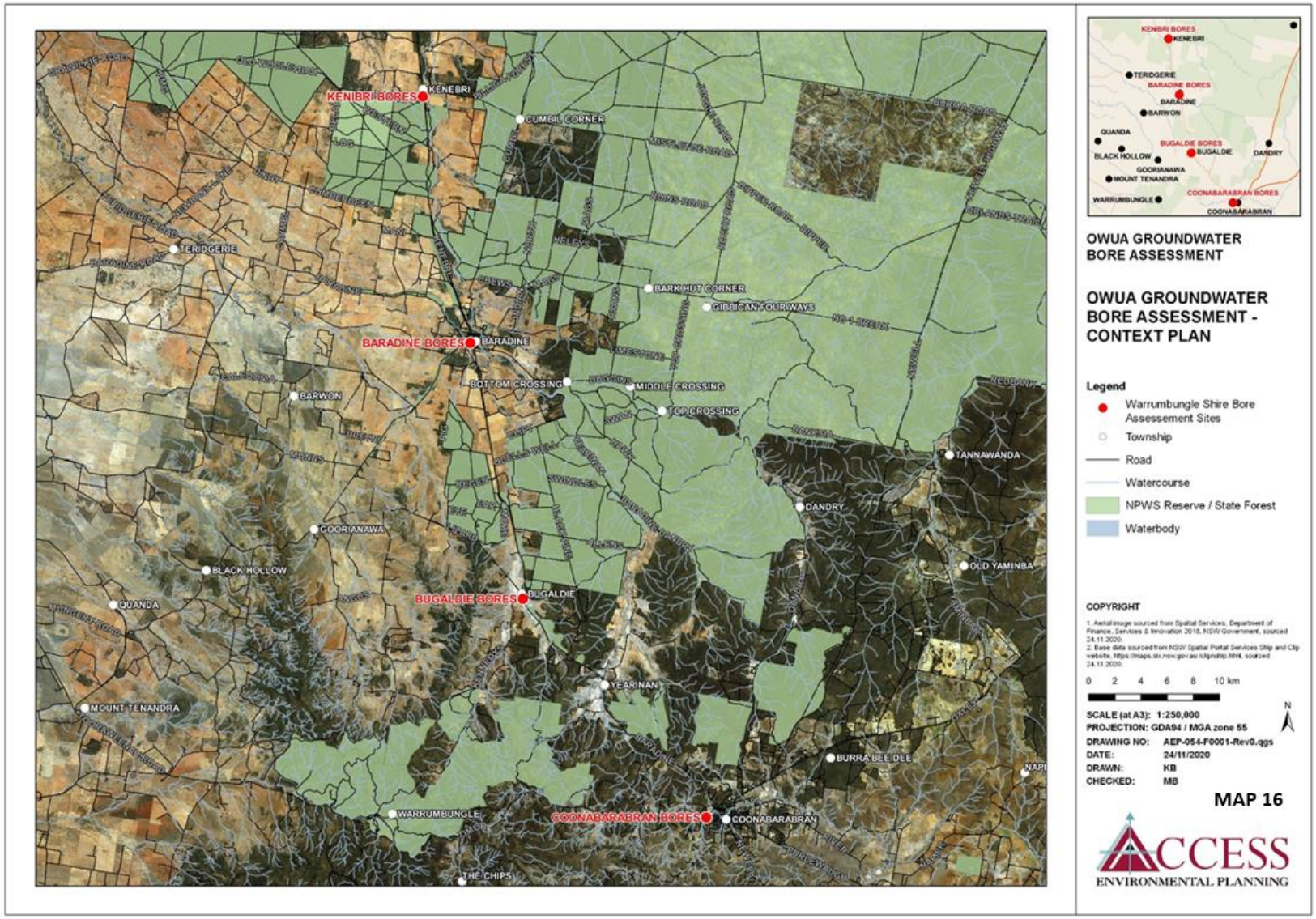
Contents

1. Warrumbungle Shire Council



Map 15: Warrumbungle Bore Sites

Disclaimer: The cadastral boundaries present on these images are indicative of the maps and are not to be used for survey purposes.



Map 2: Coonabarabran, Kenebri and Bugaldie and Baradine

Disclaimer: The cadastral boundaries present on these images are indicative of the maps and are not to be used for survey purposes.

Bore	Bore Number	Recommendation	Comments	Conclusion (risk rating)
Coonabarabran Bore 1 – Robertson Street		• Camera inspection to identify details about the bore.		
Coonabarabran Bore 2 – Namoi Street South	GW00613	• Camera inspection and pump test to monitor bore performance	Insufficient records, the bore is accessing sandstone	Moderate/high risk
Coonabarabran Bore 3 – Namoi Street North		• Camera inspection to identify details about the bore.		
Coonabarabran Bore 4 – Namoi Street North		• Camera inspection to identify details about the bore.		
Coonabarabran Bore 6, Water Plant		• Camera inspection to identify details about the bore.		
Coolah Old bore	GW027577 80CA716940			
Coolah Town Wells	GW80090	• Camera inspection recommended and consider a stage pump test to record bore performance.	Not enough information to make a full risk assessment. It is cased in sedimentary rock.	Low/moderate risk
Coolah back-up Well	GW026813 80CA716940			
Coolah Extra Well	GW059176			
Dunedoo Town Well	GW059164 80CA71638	• A camera inspection on this bore and possibly a stage pump test and keep annual records of bore to monitor bore performance	There is a presence of a white material on the pump column (possibly calcium). The age of the bore may affect the performance of the bore.	Moderate risk
Baradine Bore Main Supply	GW273121	• Recommend a camera inspection to ensure iron and manganese fouling is not occurring in the bore.	Bore is only 11 years old, good design, low risk.	Low risk
Baradine Back-up Bore	GW025187	• Recommend Camera inspection and start performance records of bore.	Bore design is high risk but in sub artesian areas, reducing the risk rating.	Moderate risk
Bugaldie Bore				

Kenebri Bore	GW007716 90CA833298	• Recommend camera inspection and start recording bore performance drawdown and yield	This bore has had some sand problems in the past but has performed well considering its age.	High risk

The Coolah Town Well and the Baradine Main Supply Bore are considered low to low/moderate risk. This is due to the type of rock the bore has been drilled into and the young age of the bore. A camera inspection and pump test have been recommended to assess the condition of the bore and to ensure manganese and iron fouling is not occurring.

The Dunedoo Town Well and the Baradine Back-up Bore are moderate risk, due to the age of the bores and the possible presence of calcium. Camera inspections and regular monitoring programs are recommended for these bores.

Coonabarabran Bore 2 and the Kenebri Bore are considered moderate/high to high risk. This is due to the old age of the bores, the material the bores are constructed with and the construction methods. Camera inspection is recommended for these bores but, given their age, Council should weigh the costs of this against full replacement.

Access EP is unable to provide a risk rating for the remaining bores due to the lack of available information. Councils should refer to Appendix A and B when performing their own risk assessment for management of these bores.

Coonabarabran

Map 3: Coonabarabran Bores

Disclaimer: The cadastral boundaries present on these images are indicative of the maps and are not to be used for survey purposes.

As information is available for only one bore in Coonabarabran, this is the only one that was risk assessed by Access EP. Appendix 4B shows information available from the Water NSW website for the Coonabarabran bore. Bore locations are shown in Map 17.A camera investigation is recommended to confirm the accuracy of information supplied by Water NSW.

Bore 1 - Robertson Street

This bore is located at the end of Robertson St, Coonabarabran. There is limited information available about this bore. The column was replaced 3 years ago and has not had issues since.

Recommendation

Camera inspection to identify details about the bore.

Field Inspection Details

GPS Coordinates	Latitude: -31.27307800 Longitude: 149.27447100
Date of Inspection	14/10/2020
Original Form A or Drill log or Bore Sketch	NA
Pump-test data available. Stage and constant test	NA
Water Quality Data	NA
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	NA
Any records of pumping sand or turbid water	NA
Any monitoring program, maintenance checks, frequency	NA
Any records of pumping problems	NA
Type of pump	Submersible
Pump depth setting	NA
Type of pump column and diameter	Poly pipe
Cleanliness of pump column when pulled. Any red or brown ochre colour?	NA
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	NA
Additional comments	Column is 3 years old

Figure 1 - Coonabarabran Robertson Street Bore

Bore 2 – Namoi St South

Bore Number: GW003613

This bore is located on the Castlereagh River, to the south of the Camp Street and Namoi Street intersection. It is 36.6 m deep and has been tested to yield 2-3 L/s. It is located on public land but is locked in a cage.

Recommendations

Bore is high risk due to age and the mild steel casing. Recommend a Camera inspection and pump test to monitor bore performance.

Field Inspection Details

GPS Coordinates	Latitude: -31.27224100 Longitude: 149.27201000
Date of Inspection	14/10/2020
Original Form A or Drill log or Bore Sketch	NA
Pump-test data available. Stage and constant test	2-3 L/s
Water Quality Data	Checked annually
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	Replaced pump 2 years ago No problems since replacement
Any records of pumping sand or turbid water	NA
Any monitoring program, maintenance checks, frequency	Checked periodically
Any records of pumping problems	NA
Type of pump	Submersible
Pump depth setting	20-30 m
Type of pump column and diameter	Poly pipe
Cleanliness of pump column when pulled. Any red or brown ochre colour?	NA
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	NA
Additional comments	

Risk Assessment

Condition of casing well cap and slab	Good condition
Well age	82 years old, high risk
Well type	Low to moderate risk
Screen material	Assume slotted, high risk
Bore material	Moderate/high risk
Pump depth setting	20-30 meters
Bore cementing	No record
Water quality	No record
Iron level	No record
Salinity Level	No record
Relationship of pump depth setting and screen level to Iron Hydroxide potential	Moderately high risk, pump is in slotted casing area
Comments	Not enough records, the bore us accessing sandstone
Conclusion	Moderate/high risk

Figure 2 - Coonabarabran Namoi Street South Bore

Bore 3 – Namoi St North

This bore is located on the northern side of the Castlereagh River, to the east of Namoi Street adjacent to the old bore. There is limited information about these bores.

Recommendation

Camera inspection to identify details about the bore.

Field Inspection Data

GPS Coordinates	Latitude: -31.26889100 Longitude: 149.27073800
Date of Inspection	14/10/2020
Original Form A or Drill log or Bore Sketch	NA
Pump-test data available. Stage and constant test	NA
Water Quality Data	Checked annually
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	NA
Any records of pumping sand or turbid water	NA
Any monitoring program, maintenance checks, frequency	PVC Casing
Any records of pumping problems	NA
Type of pump	NA
Pump depth setting	NA
Type of pump column and diameter	NA
Cleanliness of pump column when pulled. Any red or brown ochre colour?	NA
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	NA
Additional comments	

Figure 3: Coonabarabran Namoi St North Bore 3

Bore 4 – Namoi St North

This bore is located further north on Namoi Street on Lot 1, DP 1085566 Coonabarabran. This bore does not yield much water and pumps a small amount of sand. Due to this it is used as a backup water supply.

Recommendation

Camera inspection to identify details about the bore.

Field Inspection Details

GPS Coordinates	Latitude: -31.26823700 Longitude: 149.27041700
Date of Inspection	14/10/2020
Original Form A or Drill log or Bore Sketch	NA
Pump-test data available. Stage and constant test	NA
Water Quality Data	Checked annually
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	Never had a problem – doesn't provide much water Water level about 6 meters above the pump
Any records of pumping sand or turbid water	A little sand
Any monitoring program, maintenance checks, frequency	NA
Any records of pumping problems	NA
Type of pump	Submersible pump
Pump depth setting	
Type of pump column and diameter	Poly pipe
Cleanliness of pump column when pulled. Any red or brown ochre colour?	Low iron
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	Power is underground
Additional comments	

Figure 4 - Coonabarabran Namio St North Bore 4

Number 6, Water Plant

The water plant is located on Timor Rd, 1.4 km west of the Coonabarabran town centre. It is the major water supply for Coonabarabran. This bore has had minimal issues after the pump replacement in 2015. There is limited information available on this bore.

Recommendation

Camera inspection to identify details about the bore.

Field Inspection Data

GPS Coordinates	Latitude: -31.27471500 Longitude: 149.26150700
Date of Inspection	14/10/2020
Original Form A or Drill log or Bore Sketch	NA
Pump-test data available. Stage and constant test	NA
Water Quality Data	Checked annually
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	Pump replaced in 2015
Any records of pumping sand or turbid water	Clean
Any monitoring program, maintenance checks, frequency	Monitored as needed
Any records of pumping problems	NA
Type of pump	Submersible pump
Pump depth setting	20 m
Type of pump column and diameter	Poly pipe
Cleanliness of pump column when pulled. Any red or brown ochre colour?	clean
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	No overhead powerlines
Additional comments	Bore not in shed

Figure 5 - Coonabarabran Water Plant Bore

Coolah

Map 4: Coolah Bores

Disclaimer: The cadastral boundaries present on these images are indicative of the maps and are not to be used for survey purposes.

The Coolah Bores are located on Town Wells Rd, off Coolah Creek Rd, 3.2km north-east of Coolah. They are located within a locked compound and are used for the town water supply. Due to there being four bores available to the council the risk of a water shortage due to a bore failure is minimal. The bores in use are in good, working order.

Coolah – Old Bore

Bore Number: GW027577
Licence Number: 8OCA716940

Field Inspection Details

GPS Coordinates	Latitude: -31.81175000 Longitude: 149.74324000
Date of Inspection	07/10/2020
Original Form A or Drill log or Bore Sketch	Capped / decommissioned
Pump-test data available. Stage and constant test	NA
Water Quality Data	NA
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	NA
Any records of pumping sand or turbid water	NA
Any monitoring program, maintenance checks, frequency	NA
Any records of pumping problems	NA
Type of pump	NA
Pump depth setting	NA
Type of pump column and diameter	300mm (12”)
Cleanliness of pump column when pulled. Any red or brown ochre colour?	NA
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	Good accessibility to site. No overhead powerlines
Additional comments	

Figure 6 - Coolah Old Bore

Coolah Town Wells

Bore Number: GW800090

This bore was drilled in 1996 to a depth of 70.1 m. It is the major water supply for Coolah.

Recommendation

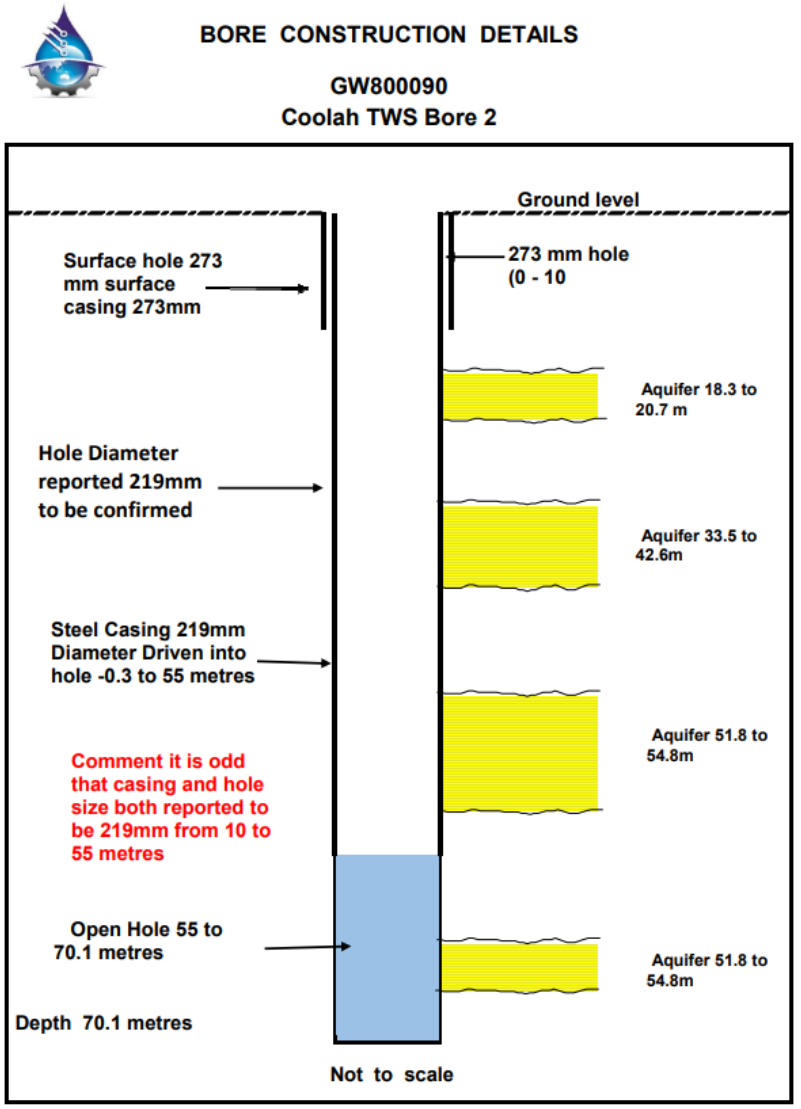
The bore is a low to moderate risk as it is cased in sedimentary rock. Unclear what is in the annulus if any material. A camera inspection is recommended and a stage test to record bore performance should be considered.

Field Inspection Details

GPS Coordinates	Latitude: -31.81169900 Longitude: 149.74299000
Date of Inspection	07/10/2020
Original Form A or Drill log or Bore Sketch	Appendix 4B
Pump-test data available. Stage and constant test	Flow is recorded
Water Quality Data	6 monthly quality test Sampling of raw water for turbidity Hard water
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	NA
Any records of pumping sand or turbid water	NA
Any monitoring program, maintenance checks, frequency	NA
Any records of pumping problems	NA
Type of pump	Submersible
Pump depth setting	70 m
Type of pump column and diameter	Steel pipe
Cleanliness of pump column when pulled. Any red or brown ochre colour?	NA
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	Screens located at 16-54 m
Estimate of specific capacity of the well. Flow rate vs drawdown	Water table at 6 m Water level: off 13m on 4m
Site details including accessibility	Powerlines are an adequate distance away from bore
Additional comments	Commissioned November 1996

Risk Assessment

Condition of casing, well cap and slab	Unknown
Well age	24 years, low/moderate risk
Well type	Low risk
Screen type	Slotted casing, low/moderate risk
Bore material	Mild steel, moderate/high risk
Pump depth setting	NA
Bore cementing	No
Gravel pack or natural pack	Gravel pack, sedimentary rock
Water quality	No record
Iron level	No record
Salinity level	No record
Relationship between pump depth setting and screen lovel on Iron Hydroxide potential	No record
Comments	Not enough information to make a full risk assessment. A camera inspection is suggested
Conclusion	Low/moderate risk








Coolah Back-up Well

Bore Number: GW026813
Licence Number: 80CA716940
This bore was drilled in 1965 10 10.1 m and yields 12.63 L/s.

Field Inspection Details

GPS Coordinates	Latitude: -31.81165500 Longitude: 149.74277800
Date of Inspection	07/10/2020
Original Form A or Drill log or Bore Sketch	Appendix 4B
Pump-test data available. Stage and constant test	NA
Water Quality Data	NA
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	NA
Any records of pumping sand or turbid water	NA
Any monitoring program, maintenance checks, frequency	NA
Any records of pumping problems	The gantry has been identified as needing to be replaced.
Type of pump	Submersible
Pump depth setting	NA
Type of pump column and diameter	Steel pipe – 1800 mm
Cleanliness of pump column when pulled. Any red or brown ochre colour?	NA
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	5 m water table
Additional comments	9 m to sandstone

Figure 7 - Coolah Back -up Well

Coolah – Extra Well

Bore Number: GW059176

This bore was drilled in 1963 to 11.5 m, with a standing water level at 4.5 metres.

Field Inspection Details

GPS Coordinates	Latitude: -31.81157500 Longitude: 149.74199800
Date of Inspection	07/10/2020
Original Form A or Drill log or Bore Sketch	NA
Pump-test data available. Stage and constant test	NA
Water Quality Data	NA
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	NA
Any records of pumping sand or turbid water	NA
Any monitoring program, maintenance checks, frequency	NA
Any records of pumping problems	NA
Type of pump	NA
Pump depth setting	NA
Type of pump column and diameter	NA
Cleanliness of pump column when pulled. Any red or brown ochre colour?	NA
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	NA
Additional comments	6 ft hole/well

Figure 8 - Coolah Extra Well

Dunedoo

Map 5: Dunedoo Bores

Disclaimer: The cadastral boundaries present on these images are indicative of the maps and are not to be used for survey purposes.

Dunedoo Town Well Bore

The Dunedoo Town Well Bore is located 600 m north of Balaro Street in Dunedoo. The Old and New Bores are both utilised. It is monitored regularly resulting in few products. The New Bore was drilled in 1963 and yields 29.18 L/s. It was drilled to 50 m with the final depth of the bore being 38 m.

Bore Number: GW059164

Licence Number: 80CA716938

Recommendation

The bore is at moderate risk and due to its old age and a camera inspection is recommended, possibly in conjunction with a stage pump test, with retention of annual records to monitor bore performance over the long term.

Field Inspection Details

GPS Coordinates	Latitude: -32.01176500 Longitude: 149.38823600
Date of Inspection	07/10/2020
Original Form A or Drill log or Bore Sketch	Appendix 4B
Pump-test data available. Stage and constant test	Draws down, flow
Water Quality Data	Chlorine, pH & turbidity checked daily Liquid chlorine dosing changing to gas
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	Had pump replaced in the past
Any records of pumping sand or turbid water	No
Any monitoring program, maintenance checks, frequency	Flow, depth & water length checked daily
Any records of pumping problems	NA
Type of pump	Submersible
Pump depth setting	
Type of pump column and diameter	Steel pipe column
Cleanliness of pump column when pulled. Any red or brown ochre colour?	White film on new pump
Details of pump and pump column diameter fittings	Casing 342 mm
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	Good clearance from powerlines
Additional comments	Switch between new and old bore monthly

Risk Assessment and Bore Sketch

Condition of casing, well cap and slab	Bore is in a pit, corrosion of surface casing could be an issue
Well age	37 years, moderate risk
Well type	Low risk
Screen type	Telescopic screen, low/moderate risk
Bore material	Mild steel, moderate/high risk
Pump depth setting	No record
Bore cementing	No
Gravel pack or natural pack	Natural pack, moderate/high risk
Water quality	No record
Iron level	No record
Salinity level	No record
Relationship of pump depth setting and screen level to iron hydroxide potential	No record
Comments	There is a presence of a white material on the pump column (possibly calcium)
Conclusion	Moderate risk

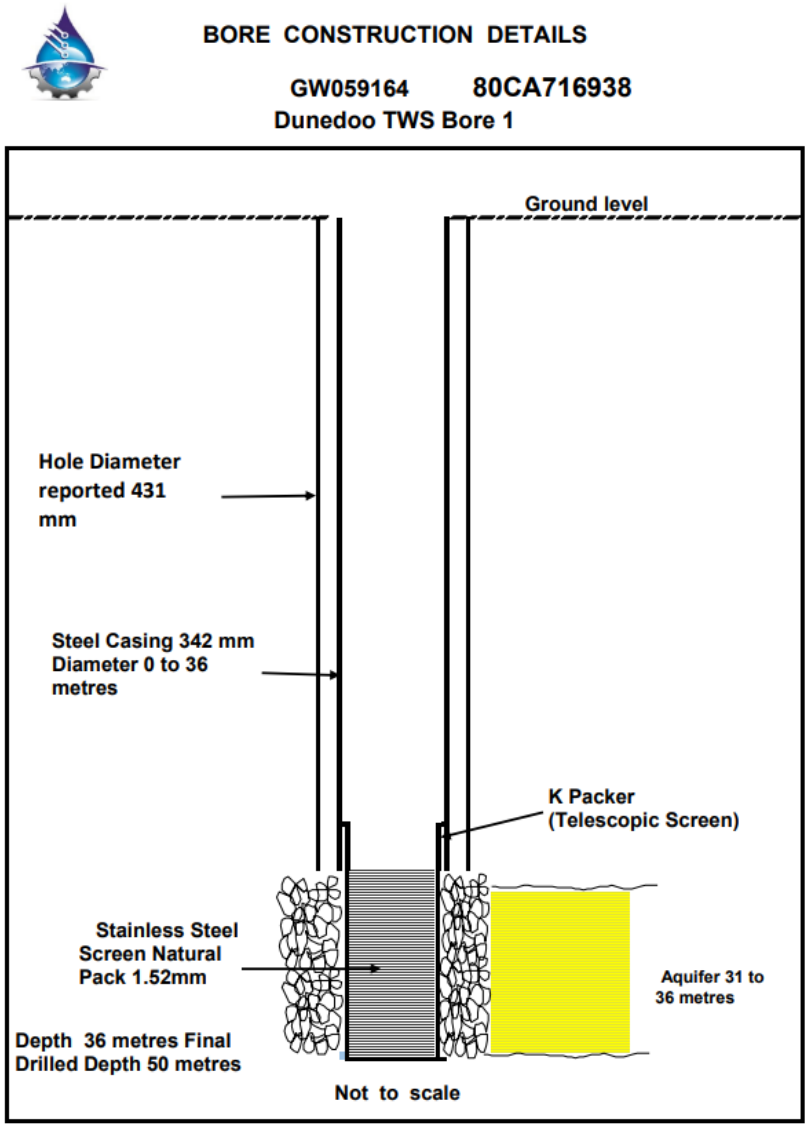
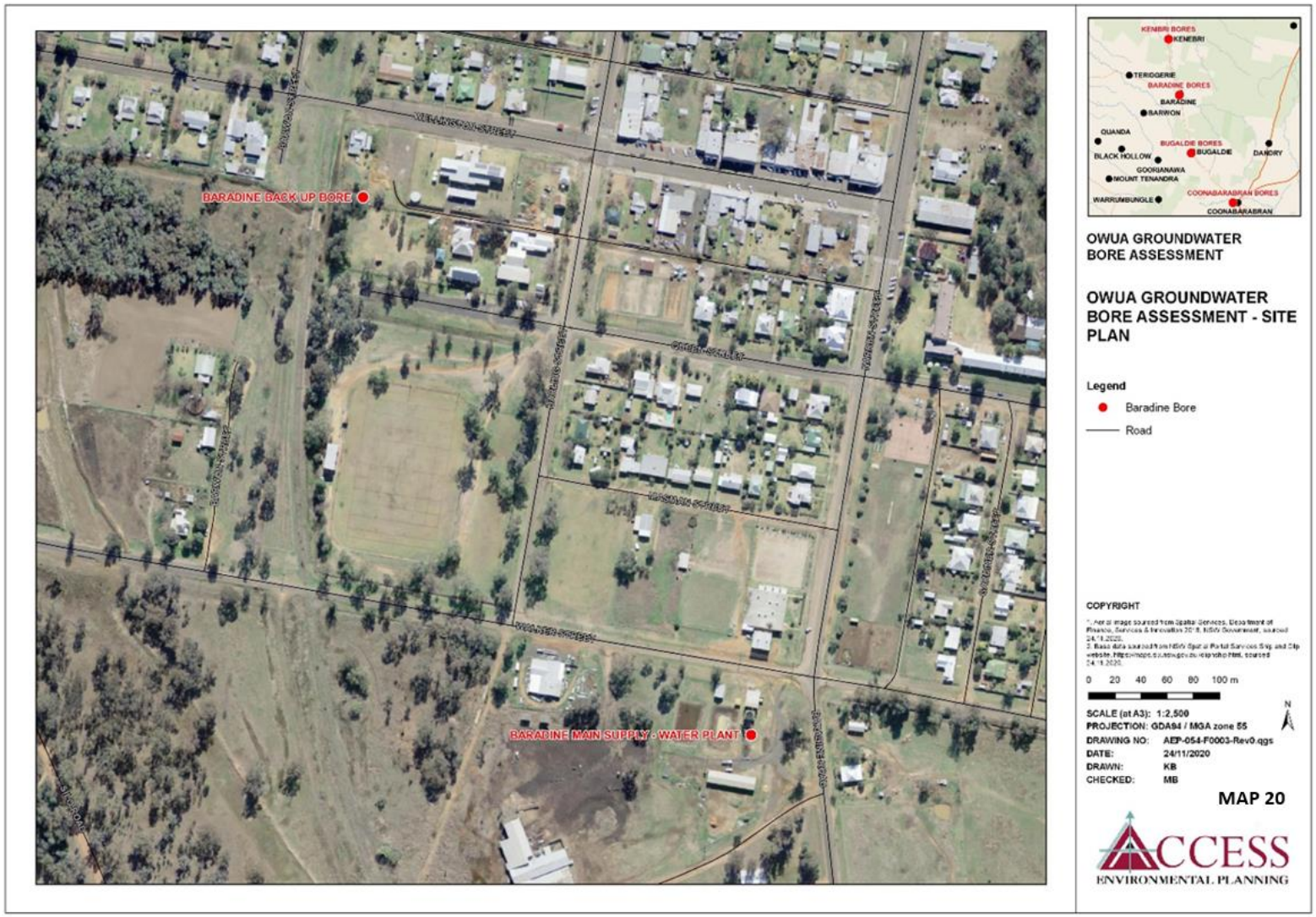


Figure 9 - Dunedoo Town Water Bore

Baradine



Map 6: Baradine Bores

Disclaimer: The cadastral boundaries present on these images are indicative of the maps and are not to be used for survey purposes.

Baradine Main Supply

This bore is located on the corner of Walker St and Narren St. On the southern outskirts of Baradine. This is the major supply for Baradine. It was constructed in 2009 to a depth of 216 m.

Bore number: GW273121

Recommendation

Camera inspection recommended to ensure iron and manganese fouling is not occurring in the bore.

Field Inspection Details

GPS Coordinates	Latitude: -30.95349300 Longitude: 149.06805200
Date of Inspection	14/10/2020
Original Form A or Drill log or Bore Sketch	Appendix 4B
Pump-test data available. Stage and constant test	NA
Water Quality Data	Iron and manganese tested daily Turbidity tested annually High iron and manganese
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	No issues in 12 years - Old bore collapsed
Any records of pumping sand or turbid water	
Any monitoring program, maintenance checks, frequency	Running full-time - 10-12 hours/ day in summer - 4-5 hours/ day in winter
Any records of pumping problems	NA
Type of pump	Submersible
Pump depth setting	200 m
Type of pump column and diameter	Stainless steel welded
Cleanliness of pump column when pulled. Any red or brown ochre colour?	Has not been removed in 12 years
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	No sand
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	NA
Additional comments	

Risk Assessment and Bore Sketch

Condition of casing, well cap and slab	Low risk
Well age	11 years
Bore Reconditioned	No
Well Design	Low risk, cemented to 180 m and sub artesian
Screen material	Slotted casing, low risk
Bore material	Mild steel, low risk, cemented
Dissimilar metals	No
Bore cementing	Cemented to 180 m, surface casing, low risk
Water quality	No record
Iron level	No record, high in iron and manganese
Salinity level	No record
Relationship of pump depth setting and screen level to iron hydroxide potential	No record
Comments	Bore is only 11 years old, good design, low risk
Conclusion	Low risk

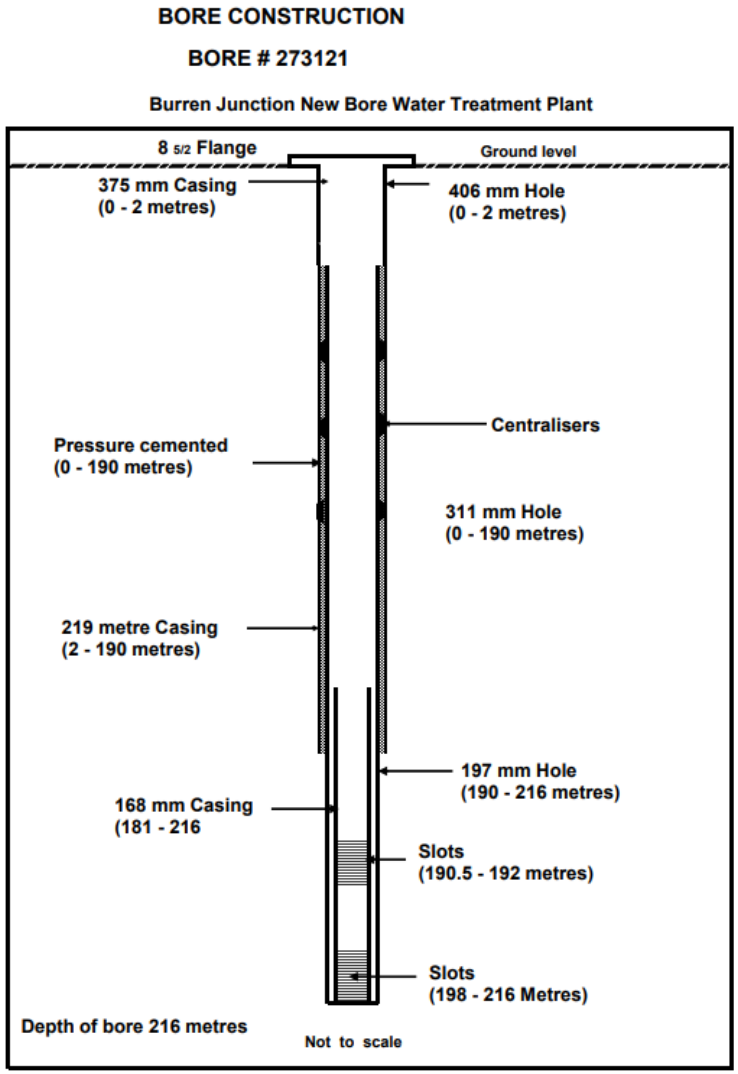


Figure 10 - Baradine Main Supply Bore

Baradine Back up Bore

This bore is located on lot 1 DP 177865 off Wellington Street. This is the back-up supply for the town and is not used often. It was drilled in 1968 to 220.9 m and yields 20.18 L/s.

Bore Number: GW025187

Recommendation

Recommend Camera inspection and start performance records of bore.

Condition of casing, well cap and slab	Bore in brick building and concrete slab
Well age	52 years
Bore Reconditioned	No
Well Design	High risk, cemented to 93 m only with a liner to 220 m
Screen material	Slotted casing, low risk
Bore material	Mild steel, moderate risk
Dissimilar metals	No
Bore cementing	Only cemented surface casing to 93 m
Water quality	No record
Iron level	No record
Salinity level	No record
Relationship of pump depth setting and screen level to iron hydroxide potential	No record
Comments	Bore design is high risk but in sub artesian areas, less risk
Conclusion	Moderate risk

Figure 11 - Baradine Back-up Bore

Bugaldie

Map 7: Bugaldie Bore

Disclaimer: The cadastral boundaries present on these images are indicative of the maps and are not to be used for survey purposes.

Bugaldie Bore

This bore is the only water supply for Bugaldie. It is located on Lot 1 DP 417380, along Baradine Road. There have been no issues since the pump replacement 12 months ago.

Field Inspection Details

GPS Coordinates	Latitude: -31.12535400 Longitude: 149.11087200
Date of Inspection	14/10/2020
Original Form A or Drill log or Bore Sketch	NA
Pump-test data available. Stage and constant test	NA
Water Quality Data	Electrical conductivity, iron content and manganese tested annually
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	Pump replaced twice in the last 12 years – worn out
Any records of pumping sand or turbid water	No sand
Any monitoring program, maintenance checks, frequency	NA
Any records of pumping problems	NA
Type of pump	Submersible
Pump depth setting	1.5 HP 7m approximately
Type of pump column and diameter	Poly pipe
Cleanliness of pump column when pulled. Any red or brown ochre colour?	Some iron, not a major issue
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	NA
Additional comments	

1.
2.

Figure 12 - Bugaldie Bore

Map 8: Kenebri Bore

Disclaimer: The cadastral boundaries present on these images are indicative of the maps and are not to be used for survey purposes.

This bore is located along Kenebri Road 800 m south of Wangmans Road. It is the only water source for this community but it only services a small number of homes. It was constructed in 1949 to a depth of 47.2 m and yields 1.23 L/s.

Bore number: GW007716

Licence Number: 90CA833298

Recommendation

This bore is high risk due to old age and old bore design. Recommend camera inspection and start recording bore performance drawdown and yield.

Field Inspection Data

GPS Coordinates	Latitude: -30.78077300 Longitude: 149.02330400
Date of Inspection	14/10/2020
Original Form A or Drill log or Bore Sketch	Appendix 4b
Pump-test data available. Stage and constant test	NA
Water Quality Data	Iron, sand & algae
Camera or previous geophysical investigations	NA
Any maintenance issues in the past	New pump 4 years ago
Any records of pumping sand or turbid water	Some sand
Any monitoring program, maintenance checks, frequency	Annually for chemical & microbiology testing
Any records of pumping problems	Two pumps have been replaced due to contamination and sand No issues since
Type of pump	Submersible pump
Pump depth setting	40-50 m
Type of pump column and diameter	Poly pipe
Cleanliness of pump column when pulled. Any red or brown ochre colour?	Iron & algae – manganese
Details of pump and pump column diameter fittings	NA
Any signs of pumping sand from bore	NA
Any examples of old pump column left near the bore indicating possible iron or corrosion issues with pump column	NA
Estimate of specific capacity of the well. Flow rate vs drawdown	NA
Site details including accessibility	Bore is in a shed
Additional comments	

Risk Assessment

Condition of casing, well cap and slab	Low risk, no obvious surface problems
Well age	71 years, high risk
Well type	Low/moderate risk
Screen type	Assume slotted casing and open hole bottom, 4 m
Bore material	Mild steel, moderate/high risk
Pump depth setting	No record
Bore cementing	No
Gravel pack or natural pack	Sedimentary rock
Water quality	Some comments on iron and sand, no data recorded
Iron level	No record
Salinity level	No record
Relationship of pump depth setting and screen level to iron hydroxide potential	No record
Comments	This bore has had some sand problems in the past
Conclusion	High risk

Figure 13 - Kenebri Bore

Conclusion

This project was undertaken by Access Environmental Planning on behalf the Orana Water Utility Alliance. A report covering Stage 1 and 2, of this project, has been presented with a full assessment of existing data and site information for each bore. Stage 1 incorporated a detailed review of available records for each bore, to understand their condition and analyse risk factors. Stage 2 involved site visits to each bore to gather more information and consolidate the risk estimation. Aggregation of all data resulted in a determination of risk rating and reflection on potential threat to water surety.

The site inspections were undertaken from October to December 2020. The LGA's visited include Central Darling, Walgett, Warren and the Warrumbungle. The field inspection allowed Access EP to gather information from Council staff that adds accuracy to the report.

The risk ranking given to each bore was determined by assessing the date of construction, diameter of the bore, cementing method, geological strata, pump diameter and yield, water quality, bore casing and pump condition, drawdown data, long-term performance and current monitoring regime. This system gave a ranking from low risk to high risk. Bores considered to be low risk are in good working order while those considered to be high risk require a large amount of maintenance or possibly replacement.

This report has been generated to give a thorough understanding of the current condition of water bores used by regional Councils. It also recommends maintenance and monitoring programs and advises on the urgency of repairs or replacement. It provides an understanding of correct and current maintenance programs that will ensure the longevity of the bore and surety of a water supply.

Thank you

The team at Access Environmental Planning would like to thank all Council staff for their cooperation during this process. The entire procedure was well received. We are appreciative of the help and support provided to us when collecting data and during on-site visits as this demonstrated a genuine commitment to this project and ensuring the presentation of a high-quality product. Without this ongoing support this project would not have been possible. It was a pleasure to work closely with Council staff and the level of professionalism demonstrates the commitment the LGA body has to their community.

Appendix 4a: Additional Information for Bores

Bore Number	Licence Number	Date of Drilling	Drilling Method	Depth of Bore	Casing depth and material	Screen Depth and Type	Annular Material	Original SWL	Reported Yield
Coolah Town Wells									
GW800090		14/01/1996	Rotary	70.1 m	0 – 55.5m Welded Steel	15.2 – 54.8 m	Gravel		
Coolah Old Bore									
GW027577	80CA716940	01/02/1967		9.3 m	0 – 9.3 m Concrete cylinder		Cemented	5.2 m	18.95 L/s
Coolah Back-up Well									
GW026813	80CA716940	01/04/1965	Hand Dug	10.1 m	0-10.1 m Concrete cylinder		Cemented	5.2 m	12.63 L/s
Coolah Extra Well									
GW059176		01/12/1983	Rotary	11.5 m	0 – 9.5 m Welded steel	9.5–11.5 m Stainless steel	Gravel	4.5 m	
Dunedoo Town Water Bore (Old)									
GW059164	80CA716938	01/12/1983	Rotary Mud	38 m	0 – 31 m Welded Steel	31 – 36 m Stainless steel	Gravel	8.6 m	29.18 L/s
Coonabarabran – Namoi St South									
GW003613		01/10/1938	Cable Tool	36.6 m	0 – 12.9 m -0.2 -12.9 m Threated steel			5.9 m	5.05 L/s
Baradine Main Supply									
GW273121		19/09/2009	Rotary Mud	216 m	0-216 m Steel	190.5-192 m 198-216 m Gauze/mesh	Cemented		
Baradine Backup bore									
GW025187		01/07/1968	Rotary Mud	221 m	0-220.8 m Welded Steel	97.5-220.9 m	Cemented	28.8 m	20.18 L/s
Kenebri Bore									
GW007716	90CA833298	01/03/1949	Cable Tool	47.2 m	-0.5-43.4 m Threaded steel			21.3m 25.9 m	1.23 L/s

Appendix 4b: Work Summary Reports

WaterNSW
Work Summary

GW003613

Licence: **Licence Status:**

Authorised Purpose(s):
Intended Purpose(s): PUBLIC/MUNICIPL

Work Type: Bore - GAB
Work Status: Supply Obtained
Construct.Method: Cable Tool
Owner Type: Local Govt

Commenced Date: **Final Depth:** 36.60 m
Completion Date: 01/10/1938 **Drilled Depth:** 36.60 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property: **Standing Water Level (m):** 5.900
GWMA: **Salinity Description:** Fresh
GW Zone: **Yield (L/s):** 5.050

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	GOWEN	COONABARRABRAN	7030//1002143
Licensed:			

Region: 80 - Macquarie-Western **CMA Map:** 8735-S
River Basin: 420 - CASTLEREAGH RIVER **Grid Zone:** **Scale:**
Area/District:

Elevation: 0.00 m (A.H.D.) **Northing:** 6537990.000 **Latitude:** 31°16'20.4"S
Elevation Source: Unknown **Easting:** 716306.000 **Longitude:** 149°16'19.2"E

GS Map: - **MGA Zone:** 55 **Coordinate Source:** GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Threaded Steel	-0.20	12.90	203			Suspended in Clamps

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
15.80	23.40	7.60	(Unknown)	5.90		5.05			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	0.91	0.91	Soil	Soil	
0.91	7.92	7.01	Sand Silt	Sand	
7.92	21.95	14.03	Sandstone Water Supply	Sandstone	
21.95	23.16	1.21	Gravel Water Supply	Gravel	
23.16	23.47	0.31	Hard Water Supply	Unknown	
23.47	26.21	2.74	Shale	Shale	
26.21	35.05	8.84	Shale Sticky	Shale	
35.05	36.58	1.53	Driller	Unknown	

Remarks

01/11/1983: COONABARABRAN TWS

*** End of GW003613 ***

WaterNSW
Work Summary

GW027577

Licence: 80CA716940 **Licence Status:** EXPIRED

Authorised Purpose(s): TOWN WATER SUPPLY
Intended Purpose(s): PUBLIC/MUNICIPL

Work Type: Well
Work Status:
Construct.Method:
Owner Type: Local Govt

Commenced Date:
Completion Date: 01/02/1967
Final Depth: 9.30 m
Drilled Depth: 9.30 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property: COOLAH T W S NSW
GWMA: 019 - COOLABURRAGUNDY - TALBRAGER VALLEY
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	BLIGH	BOOYAMURNA	125
Licensed:	BLIGH	BOOYAMURNA	Whole Lot 1//653078

Region: 80 - Macquarie-Western
River Basin: 421 - MACQUARIE RIVER
Area/District:
CMA Map: 8834-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6477184.000
Easting: 759568.000
Latitude: 31°48'41.4"S
Longitude: 149°44'31.2"E

GS Map: -
MGA Zone: 55
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Concrete Cylnder	-1.50	9.30	1829			Seated on Bottom

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
5.20	9.30	4.10	Unconsolidated	5.20		18.95			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.66	3.66	Loam Basaltic	Loam	
3.66	9.30	5.64	Gravel Basaltic River Water Supply	Gravel	

01/11/1983: PUBLIC ROADS BETWEEN PORTION 125 & 126
20/07/1984: COOLAH TWS

*** End of GW027577 ***

WaterNSW
Work Summary

GW800090

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): TOWN WATER SUPPLY
Work Type: Bore
Work Status:
Construct.Method: Rotary
Owner Type: Local Govt
Commenced Date:
Completion Date: 14/01/1996
Final Depth: 70.10 m
Drilled Depth: 70.10 m
Contractor Name: Watermin Drillers Pty Ltd
Driller: Ernest Maxwell Jones
Assistant Driller:
Property:
Standing Water Level (m):
GWMA:
GW Zone:
Salinity Description: Good
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	BLIGH	BOOYAMURNA	CLOSED ROAD BORDE
Licensed:			

Region: 80 - Macquarie-Western
CMA Map: 8834-3N
River Basin: - Unknown
Area/District:
Grid Zone:
Scale:
Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6477152.000
Easting: 759594.000
Latitude: 31°48'42.4"S
Longitude: 149°44'32.2"E
GS Map: -
MGA Zone: 55
Coordinate Source: Map Interpre

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Hole	Hole	0.00	10.00	273			Rotary Air
1		Hole	Hole	10.00	70.10	219			Rotary Air
1		Annulus	Waterworn/Rounded	0.00	55.00				
1	1	Casing	Steel	-0.30	55.50	219			Driven into Hole, Welded
1	1	Casing	Steel	0.00	10.30	273			Driven into Hole, Welded
1	1	Opening	Slots	15.20	54.80	219		1	Steel, SL: 457.0mm, A: 2.00mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
18.30	27.40	9.10	Unknown				27.40		
33.50	42.60	9.10	Unknown				42.60		
51.80	54.80	3.00	Unknown				54.80		
62.50	65.50	3.00	Unknown				65.50		

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.50	1.50	Black soil	Unknown	
1.50	6.10	4.60	Red clays	Unknown	
6.10	8.50	2.40	Sand & gravel	Unknown	
8.50	10.00	1.50	Yellow clays & boulders	Unknown	
10.00	70.10	60.10	Sandstone	Unknown	

*** End of GW800090 ***

WaterNSW
Work Summary

GW026813

Licence: 80CA716940 **Licence Status:** EXPIRED

Authorised Purpose(s): TOWN WATER SUPPLY
Intended Purpose(s): PUBLIC/MUNICIPL

Work Type: Well
Work Status:
Construct.Method: Hand Dug
Owner Type: Local Govt

Commenced Date:
Completion Date: 01/04/1965
Final Depth: 10.10 m
Drilled Depth: 10.10 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property: COOLAH T W S NSW
GWMA: 019 - COOLABURRAGUNDY - TALBRAGER VALLEY
GW Zone: -
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	BLIGH	BOOYAMURNA	99999
Licensed:	BLIGH	BOOYAMURNA	Whole Lot 1//653078

Region: 80 - Macquarie-Western
River Basin: 421 - MACQUARIE RIVER
Area/District:
CMA Map: 8834-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6477152.000
Easting: 759620.000
Latitude: 31°48'42.4"S
Longitude: 149°44'33.2"E

GS Map: -
MGA Zone: 55
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Concrete Cylinder	-1.50	10.10	1829			Seated on Bottom

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
5.20	9.80	4.60	Unconsolidated	5.20		12.63			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	2.44	2.44	Soil Black	Soil	
2.44	9.75	7.31	Gravel Basaltic River Water Supply	Gravel	
9.75	10.06	0.31	Sandstone	Sandstone	

Remarks

12/10/1987: ROADSIDE ADJ TO PORTION 125
12/10/1987: COOLAH TWS

***** End of GW026813 *****

WaterNSW
Work Summary

GW059176

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): PUBLIC/MUNICIPL

Work Type: Bore
Work Status:
Construct.Method: Rotary
Owner Type: Local Govt

Commenced Date:
Completion Date: 01/12/1983
Final Depth: 11.50 m
Drilled Depth: 11.50 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property:
GWMA:
GW Zone:
Standing Water Level (m):
Salinity Description:
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	BLIGH	BOOYAMURNA	126
Licensed:			

Region: 80 - Macquarie-Western
River Basin: 421 - MACQUARIE RIVER
Area/District:
CMA Map: 8834-3N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)
Northing: 6477150.000
Easting: 759699.000
Latitude: 31°48'42.4"S
Longitude: 149°44'36.2"E

GS Map: -
MGA Zone: 55
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Annulus	Waterworn/Rounded	8.50	11.50	500			Ungraded
1	1	Casing	Welded Steel	0.00	9.50	300			Seated
1	1	Opening	Screen	9.50	11.50	300		1	Stainless Steel

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
7.00	11.50	4.50	Unconsolidated	4.50					

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	3.60	3.60	Loam Basaltic	Loam	
3.60	11.50	7.90	Gravel Basaltic River Water Bearing	Gravel	

Remarks

09/03/1987: CLOSED ROAD BETWEEN PORTIONS 125 & 126
09/03/1987: COOLAH TWS

***** End of GW059176 *****

WaterNSW
Work Summary

GW059164

Licence: 80CA716938 **Licence Status:** CURRENT

Authorised Purpose(s): TOWN WATER SUPPLY
Intended Purpose(s): TOWN WATER SUPPL

Work Type: Bore
Work Status: Supply Obtained
Construct.Method: Rotary Mud
Owner Type: Local Govt

Commenced Date:
Completion Date: 01/12/1983

Final Depth: 38.00 m
Drilled Depth: 50.00 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property: DUNEDOO T W S Whiteley St DUNEDOO 2844 NSW
GWMA: 019 - COOLABURRAGUNDY - TALBRAGER VALLEY
GW Zone: -

Standing Water Level (m): 8.600
Salinity Description:
Yield (L/s): 29.180

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	LINCOLN	BOLARO	7009//93529
Licensed:	LINCOLN	BOLARO	Whole Lot 7009//93529

Region: 80 - Macquarie-Western
River Basin: 421 - MACQUARIE RIVER
Area/District:

CMA Map: 8733-N
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown

Northing: 6455743.000
Easting: 725608.000

Latitude: 32°00'43.1"S
Longitude: 149°23'18.7"E

GS Map: -
MGA Zone: 55
Coordinate Source: GIS - Geogra

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1		Annulus	Waterworn/Rounded	0.00	38.00	431			Graded
1		Backfill	Backfill	38.00	50.00				
1	1	Casing	Welded Steel	0.00	31.00	342			Seated
1	1	Opening	Screen	31.00	36.00	275		1	Stainless Steel, A: 1.52mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
31.00	36.00	5.00	Unconsolidated	8.60		29.18			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.00	1.00	Driller	(Unknown)	
1.00	4.00	3.00	Clay Red	Clay	

4.00	13.00	9.00	Clay Grey	Clay	
13.00	14.00	1.00	Clay Grey Some Fine Sand	Clay	
14.00	18.00	4.00	Clay Grey Some Coarse Sand	Clay	
18.00	21.00	3.00	Clay Orange	Clay	
21.00	26.00	5.00	Clay Orange Some Fine Sand	Clay	
26.00	29.00	3.00	Clay Yellow	Clay	
29.00	30.00	1.00	Clay Yellow, Sand White Medium	Clay	
30.00	32.00	2.00	Sand White Medium Water Supply, some Clay	Sand	
32.00	36.00	4.00	Sand White Medium Clean Water Supply	Sand	
36.00	37.00	1.00	Clay White Sandy	Clay	
37.00	38.00	1.00	Clay White, Sand Yellow	Clay	
38.00	39.00	1.00	Sand Yellow Medium, Clay Yellow	Sand	
39.00	45.00	6.00	Clay White	Clay	
45.00	48.00	3.00	Clay White, Sand Bands	Clay	
48.00	50.00	2.00	Clay Yellow Sandy	Clay	
50.00	50.01	0.01	Shale	Shale	

Remarks

09/03/1987: DUNEDOO TOWN WATER SUPPLY.
23/07/2012: Nat Carling, 23-July-2012; Updated coordinates, as provided by water licensing. Also updated cadastre (was entered as 'TS&CR 49654).

***** End of GW059164 *****

Page 1

NSW DEPARTMENT OF WATER & ENERGY

FORM A 0 0 0 0 0
PARTICULARS OF COMPLETED WORK

Driller's Licence No:	1729	1	
Class of Licence:	6		
Driller's Name:	Terry Guest		
Assistant Driller:	Alan Southwell		
Contractor:	NOW Groundwater Drilling		
New bore	☐	Replacement bore	X
Deepened	☐	Enlarged	☐
Reconditioned	☐	Other (specify)	
Final Depth	216 Metres		

Work Licence No:	90 CA 811515	2	
Name of Licensee:	Warrumbungle Shire Council		
Intended Use:	Town Water Supply		
Completion Date:	19th September 2009		

DRILLING DETAILS 3

From (m)	To (m)	Hole Diameter (mm)	Drilling Method Code
0	2	406	7
2	190	311	7
190	216	197	7

WATER BEARING ZONES 4

From (m)	To (m)	Thickness (m)	S W L (m)	Estimated Yield (L/s) Individual Aquifer	Estimated Yield (L/s) Cumulative	Test method Code	D D L at end of test (m)	Duration Hrs	Duration min	Salinity (Conductivity or TDS) Cond. (µS/cm)	Salinity (Conductivity or TDS) TDS (mg/L)
191.5	216	24.5		20		1		10			Fresh

CASING / LINER DETAILS 5

Material Code	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Method Fixing Code
9	375	6.4	0	2	
9	219	6.4	2	190	7
9	168	5.0	181	216	6

Casing support method Code 2

Type of casing bottom Code 8

Centralisers installed No ☐ Yes X (indicate on sketch)

Sump installed No X Yes ☐ From m To m

Pressure cemented No ☐ Yes X From 0 m To 190 m

Casing Protector cemented in place No ☐ Yes X

WATER ENTRY DESIGN 6

General Material Code	OD (mm)	Wall Thickness (mm)	From (m)	To (m)	Opening type Code	Fixing Code	Screen Aperture (mm)	Slot Details Length (mm)	Width (mm)	Alignment Code
9	168	5	190.5	192	7	6		400	4	V
9	168	5	198	216	7	6		400	4	V

GRAVEL PACK 7

Type		Grade		Grain size (mm) From	Grain size (mm) To	Depth (m) From	Depth (m) To	Quantity Litres	Quantity or m³
Rounded	☐	Graded	☐						
Crushed	☐	Ungraded	☐						
Bentonite/Grout seal	No ☐	Yes	X			0	190	225 bags	
Method of placement of Gravel Pack		Code							

For D W E use only: G W 2 7 3 1 2 1

Page 2

NSW DEPARTMENT OF

WATER & ENERGY

FORM A 0 0 0 0 0
PARTICULARS OF COMPLETED WORK

Work Licence No: W A

BORE DEVELOPMENT 8

Chemical used for breaking down drilling mud No [X] Yes [ ] Name:

Method	Bailing/Surging [ ]	Jetting	Airlifting [X]	Backwashing [ ]	Pumping [ ]	Other:
Duration	hrs	hrs	10 hrs	hrs	hrs	hrs

DISINFECTION ON COMPLETION 9

Chemical/s used	Quantity applied (litres)	Method of application

PUMPING TESTS ON COMPLETION 10

Test type		Date	Pump intake depth (m)	Initial Water Level (SWL) (m)	Pumping rate (L/s)	Water Level at end of pumping (DDL) (m)	Duration of Test (hrs)	Recovery: Water level (m)	Recovery: Time taken (hrs)	Recovery: Time taken (mins)
Multi stage (stepped drawdown)	Stage 1									
	Stage 2									
	Stage 3									
	Stage 4									
Single stage (constant rate)										

Height of measuring point above ground level _____ m Test Method Code [ ] See Code Table 4

WORK PARTLY BACKFILLED OR ABANDONED 11

Original depth of work: _____ metres Is work partly backfilled: No [ ] Yes [ ]

Is work abandoned: No [ ] Yes [ ] Method of abandonment: Backfilled [ ] Plugged [ ] Capped [ ]

Has any casing been left in the work No [ ] Yes [ ] From _____ m To _____ m

Sealing / fill type Code	From depth (m)	To depth (m)	Sealing / fill type Code	From depth (m)	To depth (m)

Site chosen by: Hydrogeologist [ ] Geologist [ ] Driller [ ] Diviner [ ] Client [X] Other _____ 12

Lot No _____ DP No _____ 13

Work Location Co ordinates Easting 6 9 7 4 3 1 Northing 6 5 7 3 5 0 6 Zone 5 5

GPS: No [ ] Yes [X] >> AMG/AGD [ ] or MGA/GDA [ ] (See explanation)

Please mark the work site with "X" on the DIPNR CLID map.
Indicate also the distances in metres from two (2) adjacent boundaries, and attach the map to this Form A package.

Signatures:

Driller: Terry Guest **Licensee:** _____

Date: 19th September 2009 **Date:** _____

Page 3

NSW DEPARTMENT OF
WATER & ENERGY

FORM A 0 0 0 0 0
PARTICULARS OF COMPLETED WORK

Work Licence No: 85 WA 751237

DRILLER'S ROCK/STRATA DESCRIPTION (LITHOLOGY) — 15

Depth From (m)	Depth To (m)	Description
0	2	Clay
2	7	Sandy Gravel
7	12	White Clay Bound Sandstone
12	17.5	Sand & Stone
17.5	24	Sand & Gravel
24	34	Yellow Sandstone
34	42	Sandstone
42	47	Iron Stone
47	192	White Sandstone & small Shale Bands
191.5	192	Fractured Sandstone
192	216	Sandstone

WORK CONSTRUCTION SKETCH

See Attached

WORK NOT CONSTRUCTED BY DRILLING RIG — 16

Method of excavation: Hand dug ☐ Back hoe ☐ Dragline ☐ Dozer ☐ Other _____

Depth (m)	Length (m)	Width (m)	Diameter (m)	Lining material	Dimentions of liner (m)	From Depth (m)	To Depth (m

Please attach copies of the following if available — 17

Geologist log	No ☐	Yes ☐	Laboratory analysis of water Sample	No ☐	Yes ☒	Pumping test(s)	No ☐ Yes ☐
Geophysical log	No ☐	Yes ☐	Sieve analysis of aquifer material	No ☐	Yes ☐	Installed Pump details	No ☐ Yes ☐

WaterNSW
Work Summary

GW025187

Licence:
Licence Status:
Authorised Purpose(s):
Intended Purpose(s): TOWN WATER SUPPL
Work Type: Bore - GAB
Work Status: Supply Obtained
Construct.Method: Rotary Mud
Owner Type: Local Govt
Commenced Date:
Completion Date: 01/07/1968
Final Depth: 220.90 m
Drilled Depth: 221.00 m
Contractor Name: (None)
Driller:
Assistant Driller:
Property:
Standing Water Level (m): 28.800
GWMA:
Salinity Description:
GW Zone:
Yield (L/s): 20.180

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	BARADINE	BARADINE	RD ADJ 2/22/758051
Licensed:			

Region: 90 - Barwon
CMA Map: 8736-S
River Basin: 419 - NAMOI RIVER
Area/District:
Grid Zone:
Scale:
Elevation: 0.00 m (A.H.D.)
Elevation Source: Unknown
Northing: 6574148.000
Easting: 697025.000
Latitude: 30°56'58.9"S
Longitude: 149°03'45.1"E
GS Map: -
MGA Zone: 55
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Welded Steel, Pressure Cemented	0.00	97.20	203			Cemented
1	1	Casing	Welded Steel, Pressure Cemented	0.00	97.20	203			
1	1	Casing	Welded Steel	95.80	220.80	152			
1	1	Opening	Slots - Vertical	97.50	220.90	152		1	A: 3.17mm

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
22.50	97.40	74.90	(Unknown)						
97.50	220.90	123.40	(Unknown)	28.80		20.18			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	33.52	33.52	Conglomerate Nominal	Conglomerate	
33.52	102.10	68.58	Sandstone Nominal Water Supply, and sand, rock, hard bands, water supply	Sandstone	
102.10	211.83	109.73	Shale Grey Nominal Water Supply, Sandstone Sand Rock, Hard Bands	Shale	
211.83	220.98	9.15	Sandstone Water Supply	Sandstone	

Remarks

04/02/1976: AQUIFER DEPTHS SUSPECT.
20/07/1984: ADJ LOT 2 SECT 22 BARADINE.
20/07/1984: BARADINE TWS.
14/05/2008: Nat Carling, 14-May-2008: Adjusted cadastre, previously entered Lot/DP was 'SEC 22'.
29/08/2011: Karla Abbs, 29-Aug-2011: Removed duplicates from drillers log

***** End of GW025187 *****

WaterNSW
Work Summary

GW007716

Licence: 90CA833298 **Licence Status:** CURRENT

Authorised Purpose(s): TOWN WATER SUPPLY
Intended Purpose(s): PUBLIC/MUNICIPL

Work Type: Bore
Work Status:
Construct.Method: Cable Tool
Owner Type: Local Govt

Commenced Date:
Completion Date: 01/03/1949

Final Depth: 47.20 m
Drilled Depth: 47.20 m

Contractor Name: (None)
Driller:
Assistant Driller:

Property: N/A WARRUMBUNGLE SHIRE COUNCIL P O BOX 191 COONABARABRAN 2357 NSW
GWMA: 023 - MISCELLANEOUS ALLUVIUM OF THE BARWON REGION
GW Zone: 013 -

Standing Water Level (m):
Salinity Description: Fresh
Yield (L/s):

Site Details

Site Chosen By:

	County	Parish	Cadastre
Form A:	BARADINE	MILLER	L16 (16)
Licensed:	BARADINE	MILLER	Whole Lot 16//750294

Region: 90 - Barwon
River Basin: 419 - NAMOI RIVER
Area/District:

CMA Map: 8736-S
Grid Zone:
Scale:

Elevation: 0.00 m (A.H.D.)
Elevation Source: (Unknown)

Northing: 6592988.000
Easting: 693571.000

Latitude: 30°46'49.4"S
Longitude: 149°01'22.2"E

GS Map: -
MGA Zone: 55
Coordinate Source: GD.,ACC.MAP

Construction

Negative depths indicate Above Ground Level; C-Cemented; SL-Slot Length; A-Aperture; GS-Grain Size; Q-Quantity; PL-Placement of Gravel Pack; PC-Pressure Cemented; S-Sump; CE-Centralisers

Hole	Pipe	Component	Type	From (m)	To (m)	Outside Diameter (mm)	Inside Diameter (mm)	Interval	Details
1	1	Casing	Threaded Steel	-0.50	43.40	152			Suspended in Clamps

Water Bearing Zones

From (m)	To (m)	Thickness (m)	WBZ Type	S.W.L. (m)	D.D.L. (m)	Yield (L/s)	Hole Depth (m)	Duration (hr)	Salinity (mg/L)
21.30	21.60	0.30	Unconsolidated	21.30		0.03			
42.60	43.50	0.90	Unconsolidated	25.90		1.20			

Drillers Log

From (m)	To (m)	Thickness (m)	Drillers Description	Geological Material	Comments
0.00	1.52	1.52	Loam Sandy	Loam	
1.52	21.33	19.81	Clay Yellow Sandy	Clay	
21.33	21.64	0.31	Sand Fine Water Supply	Sand	
21.64	42.67	21.03	Clay Yellow Sandy	Clay	
42.67	43.58	0.91	Clay Sandy Nodular Water Supply	Clay	
43.58	47.24	3.66	Sand Yellow Clay	Sand	

Remarks

24/11/1981: KENEBRI WATER SUPPLY

***** End of GW007716 *****

Appendix 4c: AHIMS Report for Warrumbungle Shire Council Bores

Coonabarabran Bores 1, 2, 3 &4

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -31.2781, 149.2632 - Lat, Long To : -31.2628, 149.2873 with a Buffer of 50 meters, conducted by Michaela Burns on 18 November 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

1	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Coonabarabran Bore 6, Water Plant

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -31.2821, 149.2504 - Lat, Long To : -31.2669, 149.2746 with a Buffer of 50 meters, conducted by Michaela Burns on 18 November 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

1	**Aboriginal sites are recorded in or near the above location.**
2	**Aboriginal places have been declared in or near the above location. ***

ID	Aboriginal Place Name
73	Happy Valley Fringe Camp
64	Nandi Common

Coolah Old Bore, Town Wells, Back-up Well & Extra Well

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -31.8161, 149.7378 - Lat, Long To : -31.8064, 149.7532 with a Buffer of 50 meters, conducted by Michaela Burns on 18 November 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Dunedoo Town Well Bore

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -32.017, 149.3787 - Lat, Long To : -32.0062, 149.3959 with a Buffer of 50 meters, conducted by Michaela Burns on 18 November 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Baradine Main Supply Bore & Back-up Bore

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -30.9598, 149.0544 - Lat, Long To : -30.9451, 149.0776 with a Buffer of 50 meters, conducted by Michaela Burns on 18 November 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

3	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Bugaldie Bore

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -31.1285, 149.1065 - Lat, Long To : -31.1237, 149.114 with a Buffer of 50 meters, conducted by Michaela Burns on 18 November 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Kenebri Bore

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -30.786, 149.0183 - Lat, Long To : -30.7794, 149.0288 with a Buffer of 50 meters, conducted by Michaela Burns on 18 November 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Appendix 4d: BioNet Atlas of NSW Wildlife search results

Coonabarabran Bore 1, 2,3 and 4 & Bore 6 (Water Plant)

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -31.22 West: 149.22 East: 149.32 South: -31.32] returned a total of 71 records of 22 species.
Report generated on 18/11/2020 2:16 PM

Kingdom	Class	Family	Scientific Name	Common Name	NSW status	Comm. status
Animalia	Aves	Ardeidae	*Ixobrychus flavicollis*	Black Bittern	V,P	
Animalia	Aves	Accipitridae	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V,P	
Animalia	Aves	Accipitridae	*^^Lophoictinia isura*	Square-tailed Kite	V,P,3	
Animalia	Aves	Cacatuidae	*^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2	
Animalia	Aves	Cacatuidae	*^Lophochroa leadbeateri*	Major Mitchell's Cockatoo	V,P,2	
Animalia	Aves	Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	V,P	
Animalia	Aves	Psittacidae	*^^Neophema pulchella*	Turquoise Parrot	V,P,3	
Animalia	Aves	Psittacidae	*^^Polytelis swainsonii*	Superb Parrot	V,P,3	V
Animalia	Aves	Climacteridae	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P	
Animalia	Aves	Acanthizidae	*Chthonicola sagittata*	Speckled Warbler	V,P	
Animalia	Aves	Meliphagidae	*Anthochaera phrygia*	Regent Honeyeater	E4A,P	CE
Animalia	Aves	Pomatostomidae	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V,P	
Animalia	Aves	Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	V,P	
Animalia	Aves	Artamidae	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P	
Animalia	Aves	Petroicidae	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	V,P	
Animalia	Aves	Petroicidae	*Petroica boodang*	Scarlet Robin	V,P	
Animalia	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	Koala	V,P	V
Animalia	Mammalia	Petauridae	*Petaurus norfolcensis*	Squirrel Glider	V,P	
Animalia	Mammalia	Vespertilionidae	*Chalinolobus dwyeri*	Large-eared Pied Bat	V,P	V
Animalia	Mammalia	Vespertilionidae	*Chalinolobus picatus*	Little Pied Bat	V,P	
Animalia	Mammalia	Vespertilionidae	*Nyctophilus corbeni*	Corben's Long-eared Bat	V,P	V

Plantae	Flora	Myrtaceae	*Homoranthus prolixus*	Granite Homoranthus	V	V

Coolah Old Bore, Town Wells, Back-up Well & Extra Well

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria: Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -31.76 West: 149.69 East: 149.79 South: -31.86] returned a total of 7 records of 7 species.
Report generated on 18/11/2020 2:27 PM

Kingdom	Class	Family	Scientific Name	Common Name	NSW status	Comm. status
Animalia	Aves	Accipitridae	*Hieraaetus morphnoides*	Little Eagle	V,P	
Animalia	Aves	Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	V,P	
Animalia	Aves	Psittacidae	*^^Polytelis swainsonii*	Superb Parrot	V,P,3	V
Animalia	Aves	Strigidae	*^^Ninox connivens*	Barking Owl	V,P,3	
Animalia	Aves	Climacteridae	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P	
Animalia	Mammalia	Dasyuridae	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E
Animalia	Mammalia	Petauridae	*Petaurus norfolcensis*	Squirrel Glider	V,P	

Dunedoo Town Well Bore

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteri : Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -31.96 West: 149.33 East: 149.43 South: -32.06] returned a total of 2 records of 2 species.
Report generated on 18/11/2020 2:35 PM

Kingdom	Class	Family	Scientific Name	Common Name	NSW status	Comm. status
Animalia	Aves	Falconidae	*Falco subniger*	Black Falcon	V,P	
Animalia	Mammalia	Petauridae	*Petaurus norfolcensis*	Squirrel Glider	V,P	

Baradine Main Supply & Back-up Bore

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria: Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -30.89 West: 149.01 East: 149.11 South: -30.99] returned a total of 80 records of 22 species.
Report generated on 18/11/2020 2:42 PM

Kingdom	Class	Family	Scientific Name	Common Name	NSW status	Comm. status
Animalia	Aves	Phaethontidae	*Phaethon rubricauda*	Red-tailed Tropicbird	V,P	C,J
Animalia	Aves	Apodidae	*Hirundapus caudacutus*	White-throated Needletail	P	V,C,J,K

Animalia	Aves	Ciconiidae	*Ephippiorhynchus asiaticus*	Black-necked Stork	E1,P	
Animalia	Aves	Accipitridae	*Circus assimilis*	Spotted Harrier	V,P	
Animalia	Aves	Accipitridae	*Hieraaetus morphnoides*	Little Eagle	V,P	
Animalia	Aves	Accipitridae	*^^Lophoictinia isura*	Square-tailed Kite	V,P,3	
Animalia	Aves	Otididae	*Ardeotis australis*	Australian Bustard	E1,P	
Animalia	Aves	Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	V,P	
Animalia	Aves	Psittacidae	*^^Polytelis swainsonii*	Superb Parrot	V,P,3	V
Animalia	Aves	Strigidae	*^^Ninox connivens*	Barking Owl	V,P,3	
Animalia	Aves	Climacteridae	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P	
Animalia	Aves	Acanthizidae	*Chthonicola sagittata*	Speckled Warbler	V,P	
Animalia	Aves	Pomatostomidae	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V,P	
Animalia	Aves	Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	V,P	
Animalia	Aves	Estrildidae	*Stagonopleura guttata*	Diamond Firetail	V,P	
Animalia	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	Koala	V,P	V
Animalia	Mammalia	Macropodidae	*Macropus dorsalis*	Black-striped Wallaby	E1,P	
Animalia	Mammalia	Pteropodidae	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V
Animalia	Mammalia	Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P	
Animalia	Mammalia	Vespertilionidae	*Chalinolobus picatus*	Little Pied Bat	V,P	
Plantae	Flora	Apocynaceae	*Tylophora linearis*		V	E
Plantae	Flora	Fabaceae (Faboideae)	*Swainsona murrayana*	Slender Darling Pea	V	V

Bugaldie Bore

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria: Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -31.07 West: 149.06 East: 149.16 South: -31.17] returned a total of 37 records of 12 species.
Report generated on 18/11/2020 2:51 PM

Kingdom	Class	Family	Scientific Name	Common Name	NSW status	Comm. status
Animalia	Aves	Cacatuidae	*^Calyptorhynchus lathami*	Glossy Black-Cockatoo	V,P,2	
Animalia	Aves	Psittacidae	*^^Polytelis swainsonii*	Superb Parrot	V,P,3	V
Animalia	Aves	Strigidae	*^^Ninox connivens*	Barking Owl	V,P,3	
Animalia	Aves	Acanthizidae	*Chthonicola sagittata*	Speckled Warbler	V,P	
Animalia	Aves	Meliphagidae	*Epthianura albifrons*	White-fronted Chat	V,P	
Animalia	Aves	Pomatostomidae	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V,P	

Animalia	Aves	Neositttidae	*Daphoenositta chrysoptera*	Varied Sittella	V,P	
Animalia	Aves	Estrildidae	*Stagonopleura guttata*	Diamond Firetail	V,P	
Animalia	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	Koala	V,P	V
Animalia	Mammalia	Petauridae	*Petaurus norfolcensis*	Squirrel Glider	V,P	
Animalia	Mammalia	Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P	
Animalia	Mammalia	Vespertilionidae	*Chalinolobus picatus*	Little Pied Bat	V,P	

Kenebri Bore

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria: Public Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Entities in selected area [North: -30.72 West: 148.97 East: 149.07 South: -30.82] returned a total of 49 records of 14 species.
Report generated on 18/11/2020 2:57 PM

Kingdom	Class	Family	Scientific Name	Common Name	NSW status	Comm. status
Animalia	Reptilia	Elapidae	*Hoplocephalus bitorquatus*	Pale-headed Snake	V,P	
Animalia	Aves	Ciconiidae	*Ephippiorhynchus asiaticus*	Black-necked Stork	E1,P	
Animalia	Aves	Psittacidae	*^^Neophema pulchella*	Turquoise Parrot	V,P,3	
Animalia	Aves	Strigidae	*^^Ninox connivens*	Barking Owl	V,P,3	
Animalia	Aves	Climacteridae	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	V,P	
Animalia	Aves	Acanthizidae	*Chthonicola sagittata*	Speckled Warbler	V,P	
Animalia	Aves	Meliphagidae	*Grantiella picta*	Painted Honeyeater	V,P	V
Animalia	Aves	Pomatostomidae	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V,P	
Animalia	Aves	Neositttidae	*Daphoenositta chrysoptera*	Varied Sittella	V,P	
Animalia	Aves	Artamidae	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P	
Animalia	Aves	Estrildidae	*Stagonopleura guttata*	Diamond Firetail	V,P	
Animalia	Mammalia	Phascolarctidae	*Phascolarctos cinereus*	Koala	V,P	V
Animalia	Mammalia	Petauridae	*Petaurus norfolcensis*	Squirrel Glider	V,P	
Animalia	Mammalia	Muridae	*Pseudomys pilligaensis*	Pilliga Mouse	V,P	V

NSW status

1	Sensitivity Class 1 (Sensitive Species Data Policy)
2	Sensitivity Class 2 (Sensitive Species Data Policy)
3	Sensitivity Class 3 (Sensitive Species Data Policy)
CH	Critical Habitat (Biodiversity Conservation Act 2016)
E1	Endangered (Biodiversity Conservation Act 2016)
E2	Endangered Population (Biodiversity Conservation Act 2016)
E3	Endangered Ecological Community (Biodiversity Conservation Act 2016)
E4	Presumed Extinct (Biodiversity Conservation Act 2016)
E4A	Critically Endangered (Biodiversity Conservation Act 2016)
E4B	Critically Endangered Ecological Community (Biodiversity Conservation Act 2016)
FCE	Critically Endangered Fish (Fisheries Management Act 1994)
FE	Endangered Fish (Fisheries Management Act 1994)
FEC	Endangered Ecological Community of Fish (Fisheries Management Act 1994)
FEP	Endangered Population of Fish (Fisheries Management Act 1994)
FKTP	Key Threatening Process of Fish (Fisheries Management Act 1994)
FP	Protected Fish (Fisheries Management Act 1994)
FV	Vulnerable Fish (Fisheries Management Act 1994)
FX	Extinct Fish (Fisheries Management Act 1994)
KTP	Key Threatening Process (Biodiversity Conservation Act 2016)
P	Protected (National Parks & Wildlife Act 1974)
V	Vulnerable (Biodiversity Conservation Act 2016)
V2	Vulnerable Ecological Community (Biodiversity Conservation Act 2016)

Commonwealth status

C	Listed on China Australia Migratory Bird Agreement
CD	Conservation Dependent (Commonwealth EPBC Act 1999)
CE	Critically Endangered (Commonwealth EPBC Act 1999)
E	Endangered (Commonwealth EPBC Act 1999)
J	Listed on Japan Australia Migratory Bird Agreement
K	Listed on Republic of Korea Australia Migratory Bird Agreement
KTP	Key Threatening Process (Commonwealth EPBC Act 1999)
V	Vulnerable (Commonwealth EPBC Act 1999)
X	Extinct (Commonwealth EPBC Act 1999)
XW	Extinct in the Wild (Commonwealth EPBC Act 1999)

Appendix A: Risk Assessment for Shallow Water Bore Design

	Low Risk	Low-Moderate Risk	Moderate-High Risk	High Risk
Condition of Casing well cap and slab	No holes or cracks. Cap tightly secured. Secured vent. Slab is present	No defects visible. Well vented but not screened. Slab is present	No holes or cracks visible. Cap loose. No slab present	Holes or cracks visible. Cap loose or missing. Can hear water running
Well Age	Less than 20 years	21 to 40 years old	41 to 60 years old	More than 60 years old
Well Type	Drilled in accordance with min drilling standards	Drilled not necessarily to standard	Drive point sand spear	Hand dug well
Screen Material	Stainless steel 316	Stainless steel	PVC slotted	Mild steel slotted casing. Bronze
Bore Material	SS361	PVC	Mild steel	Mild steel with dissimilar metals
Dissimilar metals				
Pump depth setting			Pump in screen	Pump below screen
Bore Cementing				
Gravel pack or natural pack				
Water Quality				
Iron Level	<100 mg/L	100-300 mg/L	300-1000 mg/L	>1000 mg/L
Salinity Level	<400 mg/L	400-700 mg/L	700-1000 mg/L	>1000 mg/L
Relationship of pump depth setting and screen level to iron hydroxide potential				

Appendix B: Risk Assessment for Artesian Constructed Bore

	Low Risk	Low-Moderate Risk	Moderate-High Risk	High Risk
Condition of Casing well cap and slab	No holes or cracks. Cap tightly secured. Secured vent. Slab is present	No defects visible. Well vented but not screened. Slab is present	No holes or cracks visible. Cap loose. No slab present	Holes or cracks visible. Cap loose or missing. Can hear water running
Well Age	Less than 40 years old	40 to 70 years old	71 to 100 years old	More than 100 years old
Bore Reconditioned	Reconditioned less than 20 years ago	20 to 30 years	30 to 50 years	Greater than 50 years ago
Well Type	Drilled in accordance with min drilling standards	Drilled not necessarily to standard	Drive point sand spear	Hand dug well
Screen Material	Slotted casing plasma oxy cut	Slotted casing oxy cut	Perforated casing downhole	Open hole
Bore Material	Stainless steel	Mild steel casing		PVC Casing
Dissimilar metals				
Bore Cementing	Surface casing cemented. Perkins method inside out	No surface casing. Inner casing Perkins method	Old style cementing pumped or poured from top	No cementing
Water Quality				
Iron Level	<100 mg/L	100-300 mg/L	300-1000 mg/L	>1000 mg/L
Salinity Level	<700 mg/L	700-1200 mg/L	1200-2000 mg/L	>2000 mg/L
Relationship of pump depth setting and screen level to iron hydroxide potential				

Appendix C: Generic guide for the monitoring process and suggested frequency of monitoring for town water bores

It is recommended that for town water supplies that preventative maintenance is undertaken. The frequency of this monitoring will depend on the specific town and its access to alternative water supplies should the bore fail and if the bore is pumping to the capacity of the aquifer. The table below provides a generic guide on monitoring and the suggested frequency of monitoring for a town water bore. The actual frequency needs to be tailored to meet the individual bore.

Category	Specific Activity	Schedule/Frequency
Physical inspection	Borehole colour video	A minimum 5-year interval or at pump service intervals. If the bore is high risk or has a specific problem, such as iron hydroxide, this should occur more frequently, ideally annually or biannually.
	Surface facility inspection, inspect sampling points and clean as needed	Monthly or whenever the site is visited
	Examination of withdrawn components	As needed (at lease pump test annually, if not withdrawing pump annually)
Hydraulic Performance	Well discharge rate and pressure	Weekly or monthly (recommended automatic data collection)
	Drawdown- take concurrently with well discharge measurements	Weekly or monthly (recommended installation of pressure transducer automatic recording)
	Conduct graphical analysis to determine pump performance	Quarterly
	Higher yielding bore conduct a 3 or 4 stage step test to determine bore efficiency (bores greater then 10 litres per second)	Minimum annual frequency or possibly biannual
Electric Power	System and motor voltage, current and resistance, phase imbalance	Weekly and at various pump configurations, recommend installation of alarms to existing monitors.
Physio-chemistry	Inorganic parameters	Annual measurement prior to the treatment of the water for evaluation
	Suspended particulate matter	Manually at testing or bore
	Turbidity	Manually at testing of bore. If there is a problem install inline monitoring as turbidity will change depending on time of pumping

This table has been adapted from: Sustainable Wells Maintenance, Problem Prevention and Rehabilitation, Stuart A Smith Allen E Comeskey CRC Press 2009.

Orana Water Utilities Alliance
C/- Mid-Western Regional Council
PO Box 156 MUDGEE NSW 2850
Email: simone.goodwin@midwestern.nsw.gov.au
Ph: 0447 092 639

SG | WAT500064

30 March 2022

General Manager
Engineering/Water Manager

Via email

To Whom It May Concern,

OWUA CONDITION ASSESSMENT OF EXISTING GROUNDWATER BORES INSW FUNDED PROJECT

As you are aware, some member councils are participating in an INSW funded Condition Assessment of Groundwater Bores.

Some of those member councils wished to have the scope of this funded project changed to include works rather than investigation.

An initial approval of that scope change was conditionally agreed to, however, on further discussion with the funding party it has become apparent that the change of scope being requested deviates too far from the original scope of the project both financially and technically to meet the criteria for a scope change.

As such, it is my advice to the members that we part with this project and terminate it at Task 2.

Notification of how we wish to proceed is required to be provided no later than COB Wednesday 6 April 2022 and as such, I request anyone that has a comment or wishes to object to the termination of the project to please contact me no later than Monday 4 April 2022.

Yours Sincerely

DOUG MOORBY
Chairperson Orana Water Utilities Alliance

warrumbungle SHIRE COUNCIL

Travel Expenses of Members of Council

Warrumbungle Shire Council

DATE: 16 / 6 / 2022

NAME: **Councillor Carlton Kopke**

ADDRESS: 1 Yalcogran Street
MENDOORAN

VEHICLE: LDV T60

CAPACITY: ☐ Under 2.5 litres ☑ 2.5 litres and over

Meeting: Monthly Council	16 / 6 /2022	144	kms @	.78	$	112.32
Meeting: EDT	24 / 5 /2022	144	kms @	.78	$	112.32
Meeting:	/ /2022		kms @		$	
Meeting:	/ /2022		kms @		$	
Meeting:	/ /2022		kms @		$	
			TOTAL		$	224.64 ✓

Signature of Claimant: .....

I hereby certify that:

(a) the computations of this account are correct.
(b) the charges are, so far as I am able to ascertain, fair and reasonable.

R.D

.....
For and on behalf of General Manager
17.6.2022

warrumbungle SHIRE COUNCIL

Travel Expenses of Members of Council

Warrumbungle Shire Council

DATE: 16 / 6 / 2022

NAME: **Councillor Dale Hogden**

ADDRESS: 10 Digilah Street
DUNEDOO

VEHICLE: 2.8 L Toyota Hilux.

CAPACITY: ☐ Under 2.5 litres ☐ 2.5 litres and over

Meeting: Monthly Council	19/ 5 /2022	200	kms @	.78	$	156
Meeting: M. COUNCIL	16/ 6 /2022	200	kms @	.78	$	156
Meeting: ~~COUNCIL~~	/ /2022		kms @		$	
Meeting:	/ /2022		kms @		$	
Meeting:	/ /2022		kms @		$	
			TOTAL		$	312.00 ✓

Signature of Claimant: .....

I hereby certify that:

(a) the computations of this account are correct.
(b) the charges are, so far as I am able to ascertain, fair and reasonable.

R.D.

.....
For and on behalf of General Manager
17.6.2022

warrumbungle SHIRE COUNCIL

Travel Expenses of Members of Council

Warrumbungle Shire Council

DATE: 16 / 6 / 2022

NAME: **Councillor Kathryn Rindfleish**

ADDRESS: 124 Booymurra Street,
COOLAH NSW 2843

VEHICLE: SOPHIE

CAPACITY: □ Under 2.5 litres □ 2.5 litres and over

Meeting: Monthly Council	/	/2022	174	kms @	0.78	$	135.72
Meeting:	/	/2022		kms @		$	
Meeting:	/	/2022		kms @		$	
Meeting:	/	/2022		kms @		$	
Meeting:	/	/2022		kms @		$	
				TOTAL		$	135.72

Signature of Claimant: K. Rindfleish

I hereby certify that:

(a) the computations of this account are correct.
(b) the charges are, so far as I am able to ascertain, fair and reasonable.

R.I

For and on behalf of General Manager

17.6.2022

PRESENT: Cr Carlton Kopke (Chairperson), Mr Richard Drooger (TfNSW), Senior Constable Michael Abra (NSW Police) and Mr Mal Unicomb (Local State Member Representative).

IN ATTENDANCE: Mrs Kylie Kerr (Manager Road Operations) (Minutes).

APOLOGIES: Senior Constable Kelvin Kilsby (NSW Police), Mr Gary Murphy (Director Technical Services) and Mr Sugun Selvarajah (Acting Manager Projects).

CONFIRMATION OF MINUTES
50/2122 RECOMMENDED that the minutes of the Traffic Advisory Committee meeting held on 5 May 2022 be confirmed.

Kopke/Drooger

BUSINESS ARISING FROM THE MINUTES
The following matters were noted as outstanding:

- Black Stump Way – Council request to NHVR that any road in the Warrumbungle Shire that is a 25 metre B Double Route be converted to a 26 metre B Double Route. *Matter to be followed up with Council's Director Technical Services.*
- Audit of 'No Parking' Signs in Coonabarabran CBD – 'No Parking' signs to be replaced and installed as per audit.
- Extension of double unbroken lines on the Newell Highway from Gardener Street to Dandry Road, Coonabarabran – *works scheduled with TfNSW Area Maintenance Manager.*
- Installation of Disabled Car Parking Space in Bolaro Street, Dunedoo - further investigations required in relation to a suitable design and location.
- ARTC level crossing on Golden Highway at Dunedoo – installation of yellow box markings and signage – *Council to schedule works under the RMCC.*
- Overhanging trees on the southern travel lane of Oxley Highway from the intersection of Yaminbah Road for approximately 15km – a*ssessment undertaken by TfNSW and works to be scheduled with Arborist.*
- Replacement of rail line at Mary Jane Cain Bridge, Coonabarabran – *TfNSW to undertake works.*
- Installation of Cyclist Warning Signs on Castlereagh Highway at Mendooran – *signage programmed to be installed by Council.*

<u>Implementation of 80kph Speed Zones at Rail Crossings</u>
Noted that the 80kph speed limit signs at rail crossing on Warrumbungles Way, Binnaway have been installed and ready for official opening.

<u>Reinstallation of Sign at Intersection of Castlereagh Highway and Barney's Reef Road, Birriwa</u>
The new sign to be located at the intersection of Castlereagh Highway and Barney's Reef Road, Birriwa in relation to the murder of Senior Constable John Ward by the Chinese Bushranger Sam Poo is to be installed when Council resources are available.

AGENDA ITEMS

a) StaySafe – Parliamentary Inquiry into Speed Limits and Road Safety in Regional NSW

51/2122 RECOMMENDED that:

- The Traffic Advisory Committee supports the Council putting forward a submission to the Joint Standing Committee on Road Safety (Staysafe) on the inquiry into speed limits and road safety in regional NSW.

- The submission include reference to:

    - Speed limit delegation is currently the responsibly of Transport for NSW. Council refers all speed limit review requests through to Transport for NSW for consideration.
    - Greater funding for road maintenance and upgrades including roadside infrastructure and clear zones. That grant funding application processes are more suitable to small Councils and their available resources.
    - Greater signage identifying unsuitable roads for some types of vehicles such as caravans.
    - The importance of safe clear zones on roadsides and their ongoing management.
    - There has been an increase in traffic volumes particularly heavy vehicles and tourist traffic over the past 2 years which is reducing the life of roads.

Unanimous

b) Coonabarabran Rotary Club – Tour de Warrumbungles Bike Ride Event – 2 October 2022

Local State Member Representative, Mr Mal Unicomb declared a non-pecuniary interest on this item.

52/2122 RECOMMENDED that application by Rotary Club of Coonabarabran to conduct the Tour de Warrumbungles Bike Ride event along Coonabarabran streets, local roads and regional roads on Sunday, 2 October 2022 between 8.00am and 2.00pm be approved subject to compliance with and receipt of the following:

- Traffic Management Plan
- Traffic Guidance Scheme
- TfNSW Western Region concurrence
- Council's Road Closure Guidelines
- Receipt of current Public Liability Insurance
- That a risk assessment be submitted by the organiser and distributed to Traffic Advisory Committee members for consideration
- That the organiser encourages riders in the event to wear HiVis clothing.

Unanimous

c) NSW NPWS – Tour de Gorge Bike Ride Event – 3 September 2022

53/2122 RECOMMENDED that approval be granted to NSW NPWS to conduct the Tour de Gorge Bike Ride event along Dandry Road, Coonabarabran between Coopers Road and Pilliga Pottery on Saturday, 3 September 2022 from 9.00am to 1.00pm subject to compliance with and receipt of the following:

- Traffic Management Plan
- Traffic Guidance Scheme
- Council's Standard Conditions for Use of a Road to Conduct an Event
- Receipt of current public liability insurance
- That the organiser encourages riders in the event to wear HiVis clothing.

Unanimous

d) Proposed Council Fees and Charges for Traffic Management Services

54/2122 RECOMMENDED that:

- The Traffic Advisory Committee see no negative traffic impacts of Council's change in policy.
- The Traffic Advisory Committee will continue to assess each application on its merits regardless of any fees and charges that may be imposed by Council.

Unanimous

GENERAL BUSINESS

The following matters were discussed without resolution:

- Grantham Gap Sign – discussion about the item tabled and the following items were noted to be addressed before bringing back to a future Traffic Advisory Committee meeting.
    - Check the spelling of Grantham.
    - Sign should be in keeping with other tourist signs in the Shire and the Geographical Names Board requirements.
    - Location map is required.
    - Is the sign aimed to encourage people to stop?
    - Recommend that the applicant provide a letter of support from neighbouring property owners.

- Discussion about B-Double and other heavy vehicle areas across the Shire. Clarification on where they are allowed to operate.

- Concerns about organised events with no approval happening within the road corridor that may have negative road safety implications to road and pathway users. That Council investigate options to raise issues with the event organisers.

- It has been raised with TfNSW about stacking issues across the rail line at the entrance to the Dunedoo Rest Area. It has been suggested that a clear zone be marked on the pavement at the entry to the rest area.

- TfNSW has investigated the speed limit on River Road. There are a number of solutions being considered including bringing the 50km/h speed zone closer in and adding a new 60km/h speed zone between the 50km/h and 100km/h.

- The Oxley and Newell Highway intersection upgrade was discussed. Concerns were raised about B-Doubles making u-turns in the pull off area and damage to the road. TfNSW explained that the proposal is to make the Newell Highway a priority allowing the traffic to travel straight through.

There being no further business the meeting closed at 11.15am.

The next meeting will be held in the Gallery Meeting Room, Coonabarabran on Thursday, 28 July 2022 commencing at 10.00am.

…….
CHAIRPERSON

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
18 October 2018 **164/1819** Doc ID 93423	**Item 27 Visitors Information Carpark Acquisition** **164/1819 RESOLVED** that Council surrender part of the Lot 589 DP721790 as per section 377(1)(h) of the *Local Government Act 1993* (NSW) to ensure access is maintained to the Coonabarabran Showground as per conditions of consent from the Department of Primary Industries – Lands and an easement is placed on title to reflect the access.	**DTS**	25.10.18 – Surveyor to be engaged to prepare plans showing easement for access to showground. 8.11.18 – Quotes being sought for surveyor to prepare plans. 5.04.19 – no further action until OLG request plan for easement. 3.05.19 – survey to be undertaken. 31.05.19 – survey to be undertaken when acquisition is finalised. 05.07.19 – Valuation in progress and acquisition will be finalised then survey will be undertaken 30.08.19 – Still awaiting valuation. 08.11.19 – Matter referred to Planning Department. 5.12.19 – No further action until compensation is paid to the State of NSW for the acquisition of carpark. Once acquisition finalised boundary adjustment is to be made and easement for access to be included. 10.06.20 – Refer to Item 47 – Res 122/1718. 11.08.20 – no action on easement creation 10.11.20 – Letter received from Minister Pavey re compulsory acquisition process and costs. 06.08.21 – Report to August 2021 Council meeting 07.09.21 – The process of creating a right of carriageway has been referred to Solicitors for advice and implementation. 11.10.21 – Completed. Solicitors advise that existing access arrangements are to remain in place and that creation of an easement is not necessary in order to comply with the DPI conditions. 21.01.22 – Solicitors instructed to prepare an easement. 03.02.22 – No update from the Solicitors 04.04.22 – Solicitors have engaged a surveyor to prepare the easement diagram 27.04.22 – No further update 31.05.22 – no further update from solicitors 06.07.22 – no further update from solicitors

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
12 December 2019 **236/1920** Doc ID 109985	**Item 19 Macquarie Regional Library Committee and Library Services Delivery** **236/1920 RESOLVED** that Council: 3. Requests a further report on the Library Services delivered within Warrumbungle Shire Council area, including: i. Examining the ability to join another Regional Library Service that has far more member councils and a likely to lower shared operational costs. ii. Examining the provision of Library Services outside a Regional Library arrangement. iii. Examining alternatives for the delivery of library services to the smaller towns	**DCCS**	03.02.20 – Advised Macquarie Regional Library that Council has requested options and recommendations to further consider future service point locations and opening hours. 07.04.20 – Council report partly compiled – some delay having discussions with relevant parties due to Pandemic disruptions. Expect options report available June Council meeting. 09.06.20 – Advised May Council Meeting discussions underway with a number of possible partners. 06.07.20 – Contacted possible partners requested additional information which is currently being gathered. 04.08.20 – Mid Western Council is not interested at this time and additional information has been supplied to the two possible partners approached for their further consideration. 24.09.20 – Inspection of WSC Library sites to occur Friday, 25 Sept 2020 by representatives of Namoi Regional Library 05.11.20 – Council advised informally that Namoi Regional Library discussing in committee this matter, week commencing 13.11.20 09.02.21 – Approach made to North Western Library Co-Operative for Council to consider WSC to join and under what terms, conditions and costs.
16 April 2020 **371/1920** Doc ID 113924	**Item 13 Review of Warrumbungle Waste** **371/1920 RESOLVED** that Council: 5. Costs and investigates the provision of a green waste pick up service via 240lt wheelie bins within the townships across the LGA.	**DEDS**	04.02.21 – to be commence when Manager Planning and Regulation recruited. 01.06.22 – no further progress at this stage 28.06.22 – needs a fresh report to Council as over 12 months old, to be provided in August. 06.07.22 – report to be prepared for August Council meeting
21 May 2020 **431/1920** Doc ID 115998	**Item 33.3 Three Rivers Regional Retirement Community Information Report** **431/1920 RESOLVED** that Council: 3. Seek additional funding to construct a smaller number of units at the rear of the site, being units 4, 5, 6, 7 and 8.	**DEDS**	05.06.20 – Discussions with local MPs underway regarding potential funding opportunities. 06.04.21 – Resolution soon to be greater than 12 months old, will need a fresh report to Council. 04.03.22 – awaiting legal proceedings to be finalised 03.05.22 – Funding provided by State and Commonwealth to deliver projects at Dunedoo; projects to be prioritised. 01.06.22 – Funding provided by State and Commonwealth to deliver projects at Dunedoo; projects to be prioritised 06.07.22 – Funding provided by State and Commonwealth to deliver projects at Dunedoo; projects to be prioritised

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
20 August 2020 **44/2021** Doc ID 119884	**Item 23 Baradine Camp Cypress and Showground Sewer Connection Update Report** **44/2021 RESOLVED** that Council: 2. Receives an update report once the Baradine Sewage Scheme Scoping Study is complete. The options assessment on extending sewer to Camp Cypress/Baradine Showground within the Scoping Study will contain updated cost estimates to enable a decision on affordability of realising the sewer connection with the available Council funds of $200,000.	**DEDS**	03.09.20 **–** consultant engaged under the scoping study, inception meeting scheduled for 17/9 01.10.20 – held inception meeting, scheduling site meeting. 05.11.20 – site meeting and first project workshop held for Baradine Sewage Scoping study. 27.11.20 – workshop briefing paper received; project progressing. 05.01.21 – 2nd draft received on 23 December, currently under review. 24.02.21 – received comments from DPIE on draft report, which require discussion with consultant; peer review of draft report outstanding; BBRF round 5 application under preparation for the Camp Cypress Sewer connection 08.03.21 – funding application lodged through BBRF. 09.09.21 – no outcome from BBRF application 08.10.21 – application for funding unsuccessful 29.10.21 – funding needs to be sought before it can progress. 24.11.21 – under discussion with Crown Lands in relation to possible funding. 03.12.21 – Crown Lands funding relates to work inside the reserve. Works external to the site remain unfunded. 10.01.22 – Sourcing information for Round 6 BBRF 03.02.22 – Seeking letter of support from Inland Rail for BBRF application. Scoping Study to be presented to Council. 11.04.22 – Scoping study to be presented to Council, requires further information from consultants prior 27.04.22 – Further information from consultants received, report being prepared for Council 03.05.22 – Report to be prepared for Council for July Council meeting to outline STP capabilities and additional loading mitigation measures from workers camp. 23.05.22 – Report to be prepared for Council for July Council meeting to outline STP capabilities and additional loading mitigation measures from workers camp 01.06.22 – Report to July Council meeting 06.07.22 – Report to July Council meeting

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
19 November 2020 **161/2021** Doc ID 123996	**Item 16 Acquisition of Crown Road Adjoining Former Warrumbungle Quarry** **161/2021 RESOLVED** that in relation to acquisition of Crown Road that adjoins the Boral Quarry and Council's Property 'Red Hill': 1. Council make an application to the Minister and the Governor for approval to compulsorily acquire land described as Lot 1, DP 1259353 by compulsory process under sections 186(1) and of the Local Government Act 1993 for the purpose of expansion of and prolonging the commercial viability of the Coonabarabran Quarry in accordance with the requirements of the Land Acquisition (Just Terms Compensation) Act 1991.	**DTS**	01.12.20 – Solicitors undertaking acquisition process on behalf of Council. 09.02.21 – The process of compiling documentation for submission to OLG and Crown Lands is currently occurring. 09.03.21 – Obtaining a Valuation Report has been initiated. 06.04.21 – Awaiting valuation report and Minister's consent and also awaiting completion of Native Title searches. 07.06.21 – Application to OLG currently being prepared. 09.08.21 – Documentation completed for Ministerial approval via OLG. 08.11.21 – No further information from OLG. 21.01.22 – Formal acquisition notice issued on 21 December 2021. OLG will submit Acquisition Notice of Governor's Approval after requisite period of 90 days expiring on 21 March 2022. Valuer General Valuation requested. Crown Lands has consented to the compulsory acquisition. 28.02.22 - no further update likely until the expiry of the notice period on 21 March 2022 04.04.22 – Crown Lands has consented to the compulsory acquisition. It is anticipated that the formal acquisition notice will be published in the Government Gazette in April, which will formalise and finalise the compulsory acquisition. 27.04.22 – Government Gazette published Thursday 14 April 2022 confirmed the compulsory acquisition in accordance with the Governor's approval. Awaiting Valuer General's valuation in relation to the compensation payable to Crown Lands. 31.05.22 – Valuation received and paid. 29.06.22 – Awaiting finalisation of documents. Report to August Council meeting on future directions in relation to Red Hill. 06.07.22 – No further update
	2. That the land is to be classified as operational land under the Local Government Act.		
	3. Authority be granted to the General Manager to sign all necessary documentation associated with the compulsory acquisition and to pay any compensation as determined in accordance with the provisions of the Land Acquisition (Just Terms Compensation) Act 1991.		
	4. Authority be granted to affix the Common Seal of the Council to any documentation required to effect the compulsory acquisition.		
	5. That Council staff provide a report on future directions in relation to the Quarry and proposed future operations at Red Hill.		

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
18 March 2021 **257/2021** Doc ID 129366	**Item 2 Mayoral Minute – Health and Hospital Services in the Warrumbungle Shire** **257/2021 RESOLVED** that Council: 3. Make representations to the NSW Minister for Health seeking a greater level of energy and resources being placed into rural health services and the Warrumbungle Shire, this is to include greater incentives for Visiting Medical Officers (VMOs);	**GM**	13.05.21 – To be actioned with Health Committee. 14.07.22 – Agenda item for the Health Committee meeting on 18 July 2022
	5. Consider the development of a program to help our communities be more attractive to doctors and health workers.		
15 April 2021 **304/2021** Doc ID 131100	**Item 18 Coonabarabran Water Security: Timor Dam Raising, Dam Safety Upgrade Requirements and Increased Groundwater Allocation** **304/2021 RESOLVED** that Council: 3. Applies for an increased licence allocation for Coonabarabran's groundwater bores from 50 ML/a to 400 ML/a.	**DEDS**	22.04.21 – all recommendations accepted for increase in water allocation and formalisation of contract being progressed. 05.05.21 – all recommendations accepted for increase in water allocation and formalisation of contract being progressed. 01.07.21 – Currently being developed and acted upon 03.08.21 – application for increased licence allocation to 510ML (based on IWCM draft and further details from hydrogeological report) prepared by consultant and being reviewed prior to submission 31.08.21 – application being submitted. 09.09.21 – application submitted 21.09.21 – application submitted on 1/09 and application fee paid; processing of the application is expected to take a few weeks 05.10.21 – awaiting outcome of Specific Purpose Access Licence (SPAL) application for increased allocation from 1/09 29.10.21 – awaiting outcome from application 02.12.21 – the application appears to be processed by NRAR as further information was requested, which was provided (Hydrogeologist Report, IWCM Issues Paper, IWMC Strategy Draft) 28.02.22 – application result not yet received from NRAR 04.03.22 – contact with NRAR on 4 March 2022, advice received that licence changes can take up to 2 years for processing. 03.05.22 – Awaiting on licence changes, email sent 27 April to follow up NRAR on licence change. Advised by NRAR 65days for progressing from initial request. 23.05.22 – following up with NRAR, no advice received yet. 01.06.22 – no advice from NRAR as yet. 06.07.22 – no advice from NRAR at this stage, continuing to follow up on a monthly basis

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
15 April 2021 **313/2021** Doc ID 131105	**Item 21.4 Supplementary Report** **313/2021 RESOLVED** that Council request a meeting with the Minister of Local Government to discuss concerns regarding general rate exemptions that now apply to the Local Aboriginal Lands Council.	**DCCS**	14.01.22 – Letter sent to the Minister via local member 10.4.22 – awaiting response from Minister
15 April 2021 **316/2021** Doc ID 131108	**Item 12 Draft Operational Plan and Budget 2021/22 and Delivery Program 2021/22 – 2024/25** **316/2021 RESOLVED** that Council: 4. Review its Long Term Financial Plan and Financial Sustainability Policy with a view to having a positive Operating Result before grants and contributions.	**DCCS**	To be actioned 22.06.21 – Long Term Financial Plan and Financial Sustainability Policy will be reviewed as part of the Integrated Planning and Reporting timeline for 2021/22. The Long Term Financial Plan is scheduled for review by February 2022; the Financial Sustainability Policy must be reviewed by September 2022. 10.4.22 – Financial Sustainability Policy reviewed and re-adopted by Council on 17 February 2022. LTFP currently under preparation
17 June 2021 **373/2021** Doc ID 134710	**Item 17 Review of the 2020/21 Pool Operations** **373/2021 RESOLVED** that: 4. Council investigate the cost of employing full time pool attendants.	**DTS**	07.09.21 – No action to report 21.01.22 – Some initial investigations carried out. 03.02.22 – No further action to report. Further action expected post completion of current season. 04.04.22 – Review of 2021/2022 season to be carried out. 31.05.22 – Report to June 2022 Council meeting 29.06.22 – Completed. Superseded by subsequent report resolutions.
	5. Council investigate options for a short term visitor pass.		05.07.21 – The administration process for short term visitor pass, including the issuing of electronic key access cards is being investigated. 28.02.22 - No further action to report. Further action expected post completion of current season. 04.04.22 – To be considered as part of the 2021/2022 season review. 27.04.22 – Review of pool season to be reported to June Council meeting. 31.05.22 – Report to June 2022 Council meeting 29.06.22 – Completed. Superseded by subsequent report resolutions.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
17 June 2021 **378/2021** Doc ID 134714	**Item 19 Bore Condition Assessment** **378/2021 RESOLVED** that Council: 4. Uses the remaining funds from the Bore Condition Assessment project for the construction of a secondary bore at the Coolah Town Well site.	**DEDS**	24.06.21 – Not started. Working with the OWUA to get responses from the remaining participating councils to provide their input to the SSWP project change request 01.07.21 – no response as yet 03.08.21 – OWUA Chair indicated that DPIE was not in favour of the change request, however DPIE indicated that the matter would need to be taken up with INSW as funding deed owner 31.08.21 – OWUA following up with DPIE/INSW re our project change request as MWRC administers this project 21.09.21 – still awaiting advice from DPIE/INSW through OWUA on determination of change request. 05.10.21 – still awaiting advice on determination of change request 04.11.21 – awaiting formal advice on determination of change request 02.12.21 – project change request has been approved, awaiting amended deed. 31.01.22 – fund change request approved. 03.02.22 – decommissioning works completed 28 January 2022. Project scope for secondary bore to be commenced 03.02.22 – decommissioning works completed 28 January 2022. Project scope for secondary bore to be commenced 28.02.22 – secondary bore to be assessed for delivery requirements and water quality within the current site at Coolah via test bores. Once determined and proven, new bore will be installed and commissioned by requisite contractor. Existing funding and ORANA funding to be utilised to complete works. Date to be advised. 11.04.22 – Correspondence received from OWUA advising funds cannot be utilise to undertake works and is to be used for investigations. Use of remaining funds to be re-considered. 03.05.22 – Report to be prepared for Council 01.06.22 – Report to July Council meeting 06.07.22 – Report to July Council meeting

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
17 June 2021 **387/2021** Doc ID 134718	**Item 24.3 Coolah Sewerage Treatment Plan Upgrade – Land Matters** **387/2021 RESOLVED** that Council: 2. Undertakes initial discussions with appropriate landowners in the Coolah area on the potential purchase of a suitable parcel of land, via private agreement, for the development of a new STP and associated effluent re-use scheme for Coolah.	**DEDS**	24.06.21 – As per item 1, engagement has taken place with stakeholders, and a report has been submitted. 01.07.21 – External project manager to follow up with landholder in Mid July with landholders 03.08.21 – discussion with landholder had, being followed up with a letter recommending a further options study on the land to identify potentially optimal locations for both STP and re-use scheme 31.08.21 – landholder called following letter for further discuss with Council's external PM 21.09.21 – additional land holder contacted; strategic site assessments being undertaken 06.10.21 – strategic site assessment completed to identify exclusion zones on private land, site meeting held with landholder, preparing letter to landholder to suggest detailed options study 04.11.21 – after two unsuccessful attempts, a third landholder has been contacted and site visit undertaken with outcome pending 02.12.21 – due to being unable to source an alternative site at this stage a further high-level options study is being undertaken now, also considering a (flood proof) package plant at the current site 31.01.22 – New Membrane Bioreactor (MBR) being investigated for installation at the existing site. 03.02.22 – DPIE are reviewing the potential to install a packaged system with reuse to the Golf course and river, due to high quality effluent that will be delivered from this type of plant system, with meeting to be scheduled by DPIE. 28.02.22 – Project Manager has informed of no further progress on this project in terms of land purchase. Other options such as Package Plant to be investigated. 11.04.22 – DPE decision pending on package plant 03.05.22 – DPE decision still pending 01.06.22 – Update Report to July Council meeting.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
17 June 2021 **387/2021** (cont) Doc ID 134718	**Item 24.3 Coolah Sewerage Treatment Plan Upgrade – Land Matters** **387/2021 RESOLVED** that Council: 3. Receives a further report on the outcomes of these discussions as a matter of priority.	**DEDS**	24.06.21 – No further update will be available until External PM (CD) has engaged landholders in Mid-July 03.08.21 – discussion with landholder had, being followed up with a letter recommending a further options study on the land to identify potentially optimal locations for both STP and re-use scheme 03.08.21 – discussion with landholder had, being followed up with a letter recommending a further options study on the land to identify potentially optimal locations for both STP and re-use scheme 31.08.21 – landholder called following letter for further discuss with Council's external PM 09.09.21 – additional discussions underway with landholders. 21.09.21 – strategic site assessments being undertaken 06.10.21 – strategic site assessment completed to identify exclusion zones on private land, site meeting held with landholder, preparing letter to landholder to suggest detailed options study 04.11.21 – after two unsuccessful attempts, a third landholder has been contacted and site visit undertaken with outcome pending 02.12.21 – due to being unable to source an alternative site at this stage a further high-level options study is being undertaken now, also considering a (flood proof) package plant at the current site 31.01.22 – New Membrane Bioreactor (MBR) being investigated for installation at the existing site. 03.02.22 – DPIE are reviewing the potential to install a packaged system with reuse to the Golf course and river, due to high quality effluent that will be delivered from this type of plant system, with meeting to be scheduled by DPIE. 28.02.22 – No further update on this project. 04.03.22 – options on alternative arrangements to be reviewed, no further progress at this stage. 28.03.22 – DPE decision pending on package plant 11.04.22 – DPE decision pending on package plant 03.05.22 – DPE decision still pending 01.06.22 – Report to July Council meeting

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
15 July 2021 **21/2122** Doc ID 136298	**Item 19 Coonabarabran Industrial Land** **21/2022 RESOLVED** that Council: 1. Investigates the inclusion of NBN in the subdivision development.	**DEDS**	26.07.21 – collating information on NBN possibility is in progress 03.08.21 – reviewing cost of NBN connectivity in progress 24.08.21 – Investigating options and costings with NBN Co in conjunction with other external funding received from NSW Resilience 09.09.21 – Report to September 2021 Council meeting 20.09.21 – No response from NSW Resilience regarding EOC grant extension 06.10.21 – Application for Regional Co Investment Fund submitted through NBN area manager 02.12.21 – NBN Co has organised to meet Manager Economic Development and Tourism in February 2022 to discuss connectivity options for businesses. An update report will be prepared for Council. 03.02.22 – No action to report until NBN consultations 28.02.22 – NBN met with MEDT and businesses to discuss improving connectivity. RFS building is now connected to NBN. Council requested identification number for VRA side of building from retail provider, which is first step for NBN connectivity. 03.05.22 – no further action to report 24.05.22 – followed up with retail provider, no further action to report. 01.06.22 – no further action to report. 27.06.22 – reached out to NBN Co again for recommendation to progress. 06.07.22 – no further action to report.
15 July 2021 **26/2122** Doc ID 139295	**Item 24 Notice of Motion – Cleaning out water causeways below road crossings** **26/2022 RESOLVED** that Council develop a strategy for the cleaning of causeways and their surrounds to allow the free flow of water at the road crossings.	**DTS**	09.08.21 – Causeways impacted by downstream conditions have been identified. Discussions with Fisheries and invitation issued to inspect Neible Siding Road. 11.10.21 – Fisheries officers not able to visit site due to COVID restrictions. 01.11.21 – Fisheries Officer visiting Neible Siding Road on 4 November 2021. 04.11.21 – Fisheries Officer attended site. Strategy development still under consideration. 21.01.22 – Causeway strategy still to be developed. 04.04.22 – Awaiting response from Crown Lands. 31.05.22 – Meeting with Crown Lands arranged for 28 June 2022. 28.06.22 – Crown Lands staff were unable to attend and meeting has been rescheduled to 15.07.22 06.07.22 – No further update

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
19 August 2021 **46/2122** Doc ID 138443	**Item 13 Updates to Roads Asset Management Plan** **46/2122 RESOLVED** that the following actions are taken in relation to the Roads Asset Management Plan: 1. Review and update condition rating scales and include in a revised version of AMP Roads.	**DTS**	07.09.21 – No action to report.
	2. Update the Roads AMP based on updated unit rate information provided in Table 5.3 in the attachment.		04.11.21 – Unit rates have been collated for comparison.
	3. Consult with the community on acceptable levels of road condition and on expected levels of road maintenance.		22.01.22 – Consultation on levels of service to be carried out as part of the community strategic plan process.
	4. Publicise a map identifying the location of projects in the four (4) year works program for roadworks associated with pavement renewal and pavement upgrades.		22.01.22 – Maps will be generated following the adoption of the Delivery Program 04.04.22 – No further action to report 27.04.22 – Maps will be generated following the adoption of the Delivery Program. 31.05.22 – No further update 29.06.22 – No further update. Maps will be uploaded to new Council website. 06.07.22 – No further update.
19 August 2021 **48/2122** Doc ID 138445	**Item 15 Binnaway and Mendooran Sewerage Scheme Risk Prioritisation and Funding** **48/2122 RESOLVED** that Council: 2. Challenges the determination of the Department of Planning, Industry and Environment on Council's risk score review submission for the Mendooran and Binnaway Sewerage Schemes.	**DEDS**	02.12.21 – letter to DPIE drafted 08.02.22 – no further update 28.02.22 – letter has been drafted requesting DPE for review of the risk rating to secure funding for these projects. 11.04.22 – no response from DPE 03.05.22 – update request sent to DPE seeking a response 01.06.22 – no response from DPE 06.07.22 – follow up with DPE underway, INSW following up with DPE also.
	3. Receives a further update report on the matter once a new outcome of the risk score review for Mendooran and Binnaway Sewerage Schemes has been determined.		02.12.21 – letter to DPIE drafted 28.02.22 – letter has been drafted requesting DPE for review of the risk rating to secure funding for these projects. Report will be prepared when response received. 11.04.22 – no response from DPE 03.05.22 – update request sent to DPE seeking a response 01.06.22 – No response from DPE 06.07.22 – follow up with DPE underway, INSW following up with DPE also.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
19 August 2021 **48/2122** **(cont)** Doc ID 138445	**Item 15 Binnaway and Mendooran Sewerage Scheme Risk Prioritisation and Funding** **48/2122 RESOLVED** that Council: 4. Defers the progression of the Binnaway Sewerage Scheme Concept Design until a new outcome of the risk score review for Mendooran and Binnaway Sewerage Schemes has been determined.	**DEDS**	02.12.21 – letter to DPIE drafted 28.02.22 – letter drafted and sent awaiting response. 11.04.22 – no response from DPE 03.05.22 – update request sent to DPE seeking a response 01.06.22 – no response from DPE 06.07.22 – follow up with DPE underway, INSW following up with DPE also.
16 September 2021 **76/2122** Doc ID 139897	**Item 16 Coonabarabran Aerodrome – Unsealed Runway** **76/2122 RESOLVED** that: 1. The proposed treatment method for upgrading the unsealed runway, including removal of grass and replacement with gravel road base, at Coonabarabran aerodrome is referred to the next meeting of the Aerodrome Committee.	**DTS**	11.10.21 – Site inspection held on 28 September. Survey of runway to be undertaken as part of the Obstacle Limitation Survey process. 01.11.21 – Survey of runway scheduled for 2 November 2021. 04.11.21 – Survey works in progress. 21.01.22 – Finalisation of survey delayed by wet weather.
	2. The upgrading of the unsealed runway at Coonabarabran aerodrome is included in submissions for consideration when determining the 2022/23 budget.		21.02.22 – Estimate of upgrade will be prepared following the finalisation of the survey. 03.02.22 – survey completed, estimate underway 28.02.22 – Estimate completed and included in draft 2022/23 budget 04.04.22 – Estimate of $847,743 not included in draft 2022/23 budget. 27.04.22 – Awaiting adoption of 2022/23 budget before determining next steps 31.05.22 – Project not included in the 2022/23 budget. No further action proposed. 29.06.22 – Completed.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
16 September 2021 **77/2122** Doc ID 139899	**Item 17 Aerodrome Certification** **77/2122 RESOLVED** that: 1. Council prepare necessary management plans and manual of standards to enable transition to new rules imposed by the Civil Aviation Safety Authority for certification of the Coonabarabran Aerodrome.	**DTS**	11.10.21 – Fee proposal from Consultant has been sought. 08.11.21 – Fee proposal received from Consultant. Other options being explored. 21.01.22 – Preparation of management plans underway. 03.02.22 – Management plans in progress. 28.02.22 – No further update. 03.03.22 – Meeting to be held with consultant on 15 March 2022. 04.04.22 – Draft management plan in progress 27.04.22 – Management Plan to be submitted to CASA by 13 May 2022. 31.05.22 – Management Plan submitted to CASA on 12 May 2022. 29.06.22 – Awaiting determination from CASA. 06.07.22 – No further update
	3. Council review the need for the Coolah Aerodrome.		21.01.22 – Review yet to commence. 04.04.22 – No further action 27.04.22 – Review of aerodrome to commence in May 2022. 31.05.22 – Review process commenced with internal consultation. 06.07.22 – No further update.
16 September 2021 **87/2122** Doc ID 139904	**Item 23.3 NBN Connectivity in Coonabarabran Industrial Estate** **87/2122 RESOLVED** that Council: 2. Supports use of NSW Resilience funding as a co-contribution to assist fund NBN connectivity throughout the Coonabarabran Industrial Estate.	**DEDS**	23.09.21 – No response from Resilience NSW regarding funding extension. 06.10.21 – Council's submission for Regional Co Investment Fund submitted 6 October through NBN Co. Requested grant extension for Resilience NSW grant, to be advised 03.11.21 – Followed up request for extension. Resilience NSW received Project variation and notified department they will receive variation by WSC ASAP, which was accepted 02.12.21 – Discussing options with NBN Co since Regional Co Investment Fund application was not progressed by NBN. 03.02.22 – No action to report until consultations with NBN later this month 28.02.22 – request identification number for VRA side of building through retail provider. 03.05.22 – no further action to report 25.05.22 – followed up with retail provider, no action to report. 01.06.22 – no further action to report. 27.06.22 – requested variation extension for EOC project, verbally approved and submitted paperwork. Meeting with NBN Co 05.07.22 to progress NBN connection. 07.07.22 – building ID for VRA should be identified by next week. NBN requested to meeting next week to plan engagement with local business regarding NBN.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
21 October 2021 **96/2122** Doc ID 141987	**Item 2 Mayoral Minute – Newell Highway Upgrade, Coonabarabran** **96/2122 RESOLVED** that: 1. Council Authorise the Mayor, with the assistance of a Working Group, to identify the key issues and opportunities from an optimum Bypass design and what that design might look like, identify appropriate consultant advice, prepare a brief for that advice and subsequently make submissions and representations on behalf of Council in relation to the proposed upgrade of the Newell Highway.	**Mayor/GM**	10.03.22 - A very constructive meeting was held in the Council Chamber in late November, although not all of the invitees (there are seven in total) were able to attend at such short notice. Useful strategies were identified, such as how to conduct a baseline survey of the affect that Covid shutdowns had on local business as a predictor of possible bypass effects. Correspondence to Sam Farraway MLC drafted, not sent. 15.07.22 – correspondence sent to Sam Farraway MLC on 15.07.22 in relation to the bypass.
	2. The Working Group consist of a small group of interested locals appointed by the Mayor who can assist with facilitating the above actions.		
21 October 2021 **105/2122** Doc ID 141995	**Item 10 Next Round of Regional Roads Transfer and Road Classification Review** **105/2122 RESOLVED** that Council: 1. Responds to the State Governments invitation to nominate roads for either transfer or reclassification by nominating Black Stump Way subject to the following conditions: 2. a. There is no reduction in income received by Council for roadworks associated with Black Stump Way. b. Binnia Street between Booyamurra Street and Cunningham Street is declassified as a regional road and replaced by the alternate truck route which incorporates Cunningham Street and Booyamurra Street. c. That roadworks on Black Stump Way continue to be undertaken by Council through a maintenance contract similar to that which exists on the state roads.	**DTS**	08.11.21 – Gunnedah advised that they are seeking to transfer management of Black Stump Way to State. No progress yet on Council's application. 21.01.22 – Due date for applications extended until 28 February 2022. Council submitted our application in December 2021. 27.04.22 – No further updates likely until application assessed. 31.05.22 – Additional map information requested by review body. This was provided and awaiting their determination. 24.06.22 – waiting for response from the State Government on Council's submission. 06.07.22 – No further update
	3. Support any application by Gilgandra Shire Council to reclassify Tooraweenah Road.		

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
18 November 2021 **143/2122** Doc ID 143352	**Item 16 Update Report on Acquisition of Land for Proposed Rocky Glen RFS Brigade Shed** **143/2122 RESOLVED** that: 2. Council accept the donation of land measuring approximately 30m x 44m from the owner of Lot 20, DP757085 for the purpose of constructing a shed for the Rocky Glen RFS Brigade.	**DTS**	
	3. Council classify the land to be acquired for the proposed Rocky Glen RFS Brigade Shed as operational land in accordance with s31(2) of the Local Government Act 1993.		21.01.22 - Minister's consent required to remove subdivision restriction. Advice provided. Council arranged surveyor to prepare subdivision plans. 04.02.22 – Subdivision plan prepared 27.04.22 – Subdivision Plan has identified a building encroachment that needs to be resolved. Further negotiation with landowner and RFS in progress. 31.05.22 – Awaiting response from solicitor. 29.06.22 – Staff met on site and further survey work is required to define the new area of land to be donated that addresses the building encroachment issue. 06.07.22 – No further update
18 November 2021 **144/2122** Doc ID 143353	**Item 17 Update Report on Coonabarabran Mungindi Road Upgrade Project** **144/2122 RESOLVED** that: 2. A report be prepared on the cost of preparing concept designs for a project to upgrade the road between Coonabarabran and Baradine to road train access standard.	**DTS**	03.02.22 – Estimates underway 31.05.22 – No further update 06.07.22.22 – No further update
	3. Council include the development of Gardiner Street / Saleyard Road as the heavy vehicle route from Baradine Road to the Newell Highway.		03.02.22 – will be included as part of the project.
18 November 2021 **145/2122** Doc ID 143354	**Item 18 Update Report on Management of Roadside Vegetation** **145/2122 RESOLVED** that: 2. When the opportunity arises, applications are made through NSW Environmental Trust for funding to prepare a Roadside Vegetation Management Plan.	**DTS**	04.04.22 – No current funding opportunities. 31.05.22 – No current funding opportunities. 06.07.22 – No current funding opportunities.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
18 November 2021 **146/2122** Doc ID 143355	**Item 19 Update Report on Classification and Categorisation of Crown Reserves** **146/2122 RESOLVED** that: 2. In accordance with Section 3.23 of the Crown Land Management Act 2016, notification be provided to the Minister of Council's categorisation of Crown Reserves shown in Item 1 and 2 of Resolution No 410/1920 of 21 May 2020.	**DTS**	27.04.22 – Awaiting responses from Crown Lands. 31.05.22 – Awaiting responses from Crown Lands on several categorisations and classifications before the Plans of Management can be finalised. 28.06.22 – Awaiting responses from Crown Lands on several categorisations and classifications; as well as Native Title advice before the Plans of Management can be finalised. 06.07.22 – No further update
18 November 2021 **147/2122** Doc ID 143356	**Item 20 Update Report on RFS Shed at Coonabarabran Aerodrome** **147/2122 RESOLVED** that: 2. Upon completion of the LEP review and classification of Council land at the aerodrome as operational land, a Development Application be lodged for construction of a new two (2) bay Fire Brigade shed incorporating offices and equipment storage rooms at the Coonabarabran Aerodrome.	**DTS**	21.01.22 – No further action possible until the LEP review completed in 2022. 27.04.22 – No further update. 31.05.22 – Following the Council Resolution at the May 2022 Council meeting, the classification process will commence. 29.06.22 – Planning Proposal to be prepared. 06.07.22 – No further update
18 November 2021 **148/2122** Doc ID 143357	**Item 21 Update Report on Road Closure part Castlereagh Avenue Binnaway for the Pump House Camping Ground Binnaway** **148/2122 RESOLVED** that Council: 2. Continues the part road closure of Castlereagh Avenue, Binnaway updating the licence agreement and submitting a Development Application for the Pump House Camp Ground, Binnaway as resolved previously via Resolution 162/1718.	**DTS**	21.01.22 – Two objections to be resolved. 03.03.22 – Objectors to road closure contacted and objections resolved. 04.04.22 – Solicitors instructed to finalise the part road closure. 31.05.22 – No further update. 29.06.22 - Updated advice from solicitor yet to be prepared to progress matter. Further Council report and resolution then required to proceed. Will then be in a position to prepare and lodge with Crown Lands the formal Public Road Closure application. 06.07.22 – No further update

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
18 November 2021 **149/2122** Doc ID 143359	**Item 22 Update Report on Werribee Road Premer** **149/2122 RESOLVED** that Council: 1. Apply to the Department of Primary Industries – Lands for consent under section 11 of the Land Acquisition (Just Terms Compensation) Act 1991 to issue a proposed acquisition notice to acquire part of Lot 7304 DP1159006 to establish a roadway, subject to the approval of the Minister for Local Government.	**DTS**	21.01.22 – No further update. 03.02.22 – No further update, solicitor on leave until 14 February. 03.03.22 – Surveyor instructed to prepare subdivision plan. 04.04.22 – Subdivision plan in progress. 31.05.22 – No further update. 29.06.22 – Surveyor working with Crown Lands to resolve some survey discrepancies. 06.07.22 – No further update
	2. Make an application for the compulsory acquisition of part of the land described as Lot 7304 DP1159006 for the purpose of forming an access road in accordance with the requirements of the Land Acquisition (Just Terms Compensation) Act 1991.		
	3. Make an application to the Minister and Governor for approval to acquire the part of the land described as Lot 7304 DP1159006 by compulsory process under section 186 of the Local Government Act 1993.		
	4. Authorise for the Common Seal of the Warrumbungle Shire Council to be affixed to any documentation required to effect acquisition of the land, if required.		
18 November 2021 **152/2122** Doc ID 143361	**Item 25 Dunedoo Town Water Security – Talbragar Alluvial Groundwater Source Supply** **152/2122 RESOLVED** that Council: 2. Further explores the increase of Dunedoo's Town Water Security by considering a pump test of the old bore, the cost for drilling a new deeper bore, and the potential to connect to existing deeper nearby RMS bores.	**DEDS**	28.02.22 – New deeper bore location to be explored in local site area via contractors. Delivery and quality parameters to be reviewed before determination of location 01.06.22 – No further progress 06.07.22 – No further progress
18 November 2021 **160/2122** Doc ID 143364	**Item 30.3 Sustainability of Child Care Services** **160/2122 RESOLVED** that Council consult with staff and the community on relevant actions proposed in the sustainability and child care reports.	**GM**	10.03.22 – Awaiting completion of other projects including funding acquittals.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
17 February 2022 **206/2122** Doc ID 148243	**Item 33 Notice of Motion – Hotchkiss Road** **206/2122 RESOLVED** that Council request a report on the possibility of extending the maintenance of Hotchkiss Road another 2.8km from the current end point. This would mean that Council would maintain the first 5.6km of Hotchkiss Road from the intersection of Gulargambone Road.	**DTS**	07.03.22 – Report is being prepared and will include Hotchkiss Road as well as a number of other road corridors in the same situation. 27.04.22 – Report to May Council meeting. 31.05.22 – Report to July Council meeting 06.07.22 – Report to July Council meeting
17 March 2022 **238/2122** Doc ID 149766	**Item 20 Warrumbungle Water – Fluoride Re-instatement** **238/2122 RESOLVED** that Council: 2. Executes the funding deeds for fluoridation installation at the Coolah site.	**DEDS**	11.04.22 – To be provided by NSW Health 03.05.22 – Received quotes from two contractors. Assessment process to happen week of 16 May. 01.06.22 – Funding agreement to be drafted. 06.07.22 – awaiting funding agreement from NSW Health
17 March 2022 **248/2122** Doc IDs 149768 and 149770	**Item 28 Supplementary Report – Draft Operational Plan and Delivery Program 2022/23 – 2025/26** **248/2122 RESOLVED** that: 1. Seeks an Additional Special Variation (ASV) of 2.5%, advising that: a. the ASV be a permanent special variation under section 508(2) of the *Local Government Act 1993* (NSW); and b. the additional income that Council will receive from the ASV will be approximately $205,000 (inclusive of the rate pegging limit of 0.7%); and c. Council has been working to improve its financial result and the ASV will be necessary to maintain existing services. Council has already been suffering adverse revenue impacts from natural disasters and escalating costs; and d. Council recognises that this will have an impact on ratepayers and the community in 2022-23 and beyond. It is further recognised that the increase is, if permanent, reasonable and still below inflation levels.	**GM**	10.04.22 – ASV currently being prepared 07.06.22 – Application submitted. Awaiting IPART advice 14.07.22 – Application has been approved for 2.5% Completed.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
17 March 2022 **251/2122** Doc ID 149771	**Item 26 Notice of Motion – Accessible Residential Housing** **251/2122 RESOLVED** that: 1. Council recognises the need for greater amounts of accessible residential housing in the Warrumbungle Shire for our aging and disabled residents. To help remedy this situation council commits to a pilot project of investment within the Warrumbungle Shire, using up to $1 million from funds that are currently held in term deposit to purchase suitable property(ies) that can be leased to disability housing service providers as a form of portfolio diversification at a higher cash return with low risk. 2. The Mayor and GM be authorised to negotiate and purchase on behalf of Council and report any dealings to next Council meeting.	**GM**	10.04.22 – meetings being arranged with providers. 09.05.22 – Presentation to councillors arranged for May. 07.06.22 – Presentation revealed that local organisation is progressing to the development of their own proposal. Awaiting outcome here.
21 April 2022 **269/2122** Doc ID 151481	**Item 14 Land Owned by Council in Reservoir Street Coonabarabran** **269/2122 RESOLVED** that Council: 2. Develops a detailed business case for the original 30 lot subdivision addressing issues such as but not limited to projected market demand, costs of development, projected rate of uptake, potential for return on investment, development risks and delivery mechanism.	**DTS**	27.04.22 – No progress to date. 31.05.22 – Initial discussions with third parties held. 29.06.22 – Discussions initiated with Landcom. 06.07.22 – No further update
21 April 2022 **270/2122** Doc ID 151482	**Item 15 Stop and Play Project at Neilson Park, Coonabarabran** **270/2122 RESOLVED** that Council: 2. Be advised of the costs of the rectification works through the Quarterly Budget Review process.	**DTS**	27.04.22 – Supplementary vote for QBRS prepared. 31.05.22 – Report to be included in QBRS3. 06.07.22 – Contract award amount $79,376. This excludes easement costs.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
21 April 2022 **277/2122** Doc ID 151484	**Item 20.2 Supplementary Report – Three Rivers Regional Retirement Community Information** **277/2122 RESOLVED** that Council: 1. Give the authority as outlined in the 'Proposal' contained within the report.	**GM**	09.05.22 – Being actioned.
19 May 2022 **288/2122** Doc ID 152891	**Item 6 Community Consultation Meetings** **288/2122 RESOLVED** that Council: 3. Hold Round 1 of the Community Consultation Meetings 2022/2023 in October and November 2022.	**MCorpS**	25.05.22 – dates to be determined
19 May 2022 **290/2122** Doc ID 152893	**Item 8 2022 Local Government NSW Annual Conference** **290/2122 RESOLVED** that Council: **1.** Note the report on the LGNSW Annual Conference to be held in the Hunter Valley from 23 October 2022 to Tuesday 25 October 2022.	**GM**	25.05.22 – Noted 14.07.22 – to be dealt with at August 2022 Council meeting
	2. Call for draft motions from councilors for the conference.		
	3. Consider motions and Councillor attendees at the August 2022 Council meeting.		
19 May 2022 **291/2122** Doc ID 152894	**Item 9 Cooinda Coonabarabran Water and Trade Waste Charges** **291/2122 RESOLVED** that Council: **1.** Not accede to Cooinda Coonabarabran's request to waive water charges.	**GM**	24.05.22 – Letter sent to Cooinda advising Councils decision. 14.07.22 - Completed
	2. Agrees to enter into a payment plan with Cooinda Coonabarabran ending 30 June 2023 with no interest being applied during that time.		

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
19 May 2022 **299/2122** Doc ID 152899	**Item 16 Community Development Coordinator Program – Memorandum of Understanding (MOU)** **299/2122 RESOLVED** that Council endorse the Memorandum of Understanding for the Community Development Coordinator Program and enter into the arrangements with each of the local Development Groups and Progress Associations for the period 2022/23 to 2024/25.	**GM**	07.06.22 – Arrangements being made with groups. 14.07.22 – letters sent to groups Completed
19 May 2022 **301/2122** Doc ID 152901	**Item 18 Robertson Oval Advisory Committee** **301/2122 RESOLVED** that the late nomination for membership of the Robertson Oval Advisory Committee from Mr Chris Sullivan be accepted.	**DTS**	31.05.22 – Noted. Mr Sullivan advised verbally. To be confirmed in writing. 28.06.22 – Mrs Sullivan notified in writing on 08.06.22. Doc ID 153937. Complete. 06.07.22 – Completed.
19 May 2022 **307/2122** Doc ID 152904	**Item 24 Planning Proposals – LEP Review and Reclassification of Land** **307/2122 RESOLVED** that: 1. The list of nominated Heritage Items listed in Table 6 of the *Warrumbungle Community Based Heritage Study* be added into the LEP Review Planning Proposal.	**DEDS**	01.06.22 – to be included in LEP Review 06.07.22 – will occur when gateway approval provided by DPE
	3. The General Manager, in consultation with the Mayor is delegated, to place the Planning Proposals on public exhibition and to hold a public hearing for the reclassification of land Planning Proposal.		01.06.22 – Public exhibition and public hearing to be conducted
	4. Council not accept plan making delegations for the LEP Review Planning Proposal and the Reclassification of Land Planning Proposal and seek this to be completed by Department of Planning and Environment.		23.05.22 – in progress 01.06.22 – reclassification of land planning proposal up loaded to portal and under gateway determination by DPE
	5. A report be prepared on the submissions received to the exhibition of the Planning Proposals.		01.06.22 – yet to be progressed 06.07.22 – cannot progress until after public exhibition is undertaken

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
19 May 2022 **309/2122** Doc ID 152906	**Item 26 Notice of Motion – Review Council Services and Infrastructure** **309/2122 RESOLVED** that Council review services and infrastructure due to higher usage of public facilities e.g. cleaning of toilets, servicing of public areas within the Council budget.	**DTS**	31.05.22 – Noted. Report to Council in preparation. 06.07.22 – No further update
19 May 2022 **310/2122** Doc ID 152907	**Item 27 Notice of Motion – Technology** **310/2122 RESOLVED** that Council identify IT upgrades to support an effective up to date website development for Warrumbungle's Shire. Do not get left behind on technology. A report back to Councillors on the above.	**MCorpS**	06.06.22 – Report being prepared.
16 June 2022 **325/2122** Doc ID 154348	**Item 8 Minutes of Economic Development and Tourism Advisory Committee Meeting** **325/2122 RESOLVED** that Council: 1. Notes the minutes of the Economic Development and Tourism Advisory Committee Meeting held 24 May 2022.	**DEDS**	28.06.22 – Complete.
	2. Notes the Mayor's acceptance of the events and allocations to be applied for under the Community Events Program Fund as per the attachment provided with the minutes; • with relevant event organisations required to provide information on their event to Council prior to 14 June 2022 • and any unallocated funds going towards $2,000 for Leadville, Mendooran's town festival event or Coonabarabran's music and food event.		30.06.22 – Due to delays receiving event information from organisations, completed by 01.07.22. As per Mayor's delegation, unallocated funds to: • Robertson Oval Opening Day - $2,000 • Leadville - $2,000 • Mendooran Town celebration $4,000 • Coolah laser disco event $7,000 • Coonabarabran food + wine fest - $10,000 Coonabarabran food + wine fest has an advisory committee of Council as per Mayor's delegation 06.07.22 – funding application being prepared for events.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
16 June 2022 **325/2122** **(cont)** Doc ID 154348	**Item 8 Minutes of Economic Development and Tourism Advisory Committee Meeting** **325/2122 RESOLVED** that Council: 3. Continues to operate the Coonabarabran Visitor Information Centre as a Level 1 Accredited Visitor Information Centre.	**DEDS**	28.06.22 – Complete.
	4. Supports town entry signage consultation within Council's communities including the Aboriginal Land Council, being undertaken by members of the Economic Development and Tourism Advisory Committee, with findings being reported to Council at a later date.		04.07.22 – EDT Committee members to report to EDT Committee in August meeting for proposed town signage designs, materials, and locations
	5. Investigates eligible grants for construction of an information notice board to be installed at Hickeys Falls; along with costings for a suitable toilet.		04.07.22 – Ongoing and to report at EDT committee meeting in August
	6. Notes the actions within the Building Our Warrumbungle Communities Action Plans for future planning and funding applications if funding opportunities arise.		04.07.22 – Complete
	7. Undertakes a review of the Building Our Warrumbungle Communities Action Plans selecting actions that can be achieved by Council in the short-term for inclusion in Council's EDT Strategy.		04.07.22 – report of identified short term actions from Building Our Warrumbungle Communities Action Plans completed for EDT committee meeting in August
16 June 2022 **326/2122** Doc ID 154349	**Item 9 Robertson Oval Amenities Building Project and Minutes of Advisory Committee Meeting – 25 May 2022** **326/2122 RESOLVED** that Council: 1. Notes the minutes of the Robertson Oval Advisory Committee meeting held at Dunedoo on the 25 May 2022.	**DTS**	28.06.22 – Noted. Completed
	2. Proceeds with the expenditure of $85,000 on the installation of sub soil drainage and construction of the car park.		28.06.22 – Estimates for works being prepared. 06.07.22 – Quotations called for works.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
16 June 2022 **327/2122** Doc ID 154350	**Item 10 Determination of the Local Government Remuneration Tribunal 2022 Annual Report and Determination** **327/2122 RESOLVED** that Council determine: i. The annual fees for Councillors for 2022/23 be the maximum amount of $12,650.	**GM**	14.07.22 – Noted – Fees Updated Completed
	ii. The annual fee for the Mayor for 2022/23 be the maximum amount of $27,600.		
16 June 2022 **328/2122** Doc ID 154351	**Item 11 Meeting Schedule** **328/2122 RESOLVED** that Council: 1. Adopts the following Meeting Schedule: July 2022 Thursday 21 August 2022 Thursday 18 September 2022 Thursday 15 October 2022 Thursday 20 November 2022 Thursday 17 December 2022 Thursday 8	**GM**	14.07.22 – Noted Completed
	2. Meetings be held and chaired from the Coonabarabran Chambers until further advice is provided on improved technology at the Coolah Chambers.		
16 June 2022 **329/2122** Doc ID 154352	**Item 12 Cooinda Coonabarabran Liquid Trade Waste Charges** **329/2122 RESOLVED** that Council: 1. Not accede to Cooinda Coonabarabran's request to waive the liquid trade waste charges and the charges be paid on a interest free payment plan until 30 June 2024.	**GM**	14.07.22 – Letter sent to Cooinda Completed
	2. Make a $19,500 donation to Cooinda Coonabarabran upon compliance with liquid trade waste requirements.		

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
16 June 2022 **332/2122** Doc ID 154353	**Item 15 Quarterly Budget Review Statement for the 3rd Quarter Ending 31st March 2022** **332/2122 RESOLVED** that Council: 1. Accept the second quarter Quarterly Budget Review Statement for the 2021/22 financial year, as presented;	**DCCS**	30.06.2022 – Complete
	2. Approve the variations as described in Table 1a; and		30.06.2022 – Complete
	3. Note and accept the information provided on the status of the rates and annual charges for the period ending 31 March 2022.		30.06.2022 – Complete
16 June 2022 **334/2122** Doc ID 154355	**Item 17 Review of the 2021/22 Pool Operations** **334/2122 RESOLVED** that: 1. Council notes the information contained within the Review of the 2021/22 Pool Operations Report.	**DTS**	28.06.22 – Noted. Complete
	2. A Councillor workshop be held to discuss the strategic direction for pool operations across the Shire including the implications of the consultants reports as outlined within the body of the report.		28.06.22 – Scheduled for 28.07.22 06.07.22 – No further update
	3. The outcomes of the workshop be reported back to Council.		28.06.22 – Report to be prepared. 06.07.22 – No further update
16 June 2022 **335/2122** Doc ID 154357	**Item 18 Baradine Water Treatment Plant Upgrade** **335/2122 RESOLVED** that Council: 1. Notes the information contained in the Baradine Water Treatment Plant Upgrade report.	**DEDS**	28.06.22 – Complete
	2. Accept the funding offer from DPE Water of $375,000 under the Safe and Secure Water Funding program for project SSWP408 Baradine Water Treatment Plant Upgrade, as a 75% contribution towards the $500,000 cost of developing the concept design and ancillary pre-construction documentation.		28.06.22 – Complete
	3. Approve the affixing of the Council Seal, if necessary, to the Funding Deed - Baradine Water Treatment Plant between Council and DPE Water.		28.06.22 – Complete

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
16 June 2022 **336/2122** Doc ID 154358	**Item 19 Companion Animals Fees & Charges 2022/23** **336/2122 RESOLVED** that Council: 1. Notes the information contained in the Companion Animals Fees & Charges 2022/2023 Report.	**DEDS**	27.06.22 – Complete
	2. Adopts the 2022/2023 fees and charges for companion animals as provided by Office of Local Government and updates the Revenue Policy Fees and Charges 2022/2023 to include the new fees and charges.		2706.22 – Complete
16 June 2022 **337/2122** Doc ID 154359	**Item 20 Inland Rail Update Report – June 2022** **337/2122 RESOLVED** that Council: 1. Notes the information in the Inland Rail Update Report.	**DEDS**	28.06.22 – Complete
	2. Actively engage with ARTC and their contractors to consider funding the upgrade and sealing of the Baradine Aerodrome.		04.07.22 – Council to discuss at next N2N Project Update meeting with ARTC and Contractors which is scheduled for 21.07.22
16 June 2022 **339/2122** Doc ID 154360	**Item 23 Mayoral Minute – Valley of the Winds Wind Farm** **339/2122 RESOLVED** that Council: 1. Lodge a submission on the proposed Valley of the Wind's Wind Farm noting our objections to the Proposal.	**DEDS**	28.06.22 – Complete
	2. Write to the Premier as soon as possible to seeking a substantial injection of funds to help build Council's capacity to, in turn, help the State deliver the target of 80% renewable energy into the grid by 2030;		28.06.22 – to be commenced 06.07.22 – letter being drafted
	3. Seek the support of LGNSW Conference calling for more financial support and collaboration from the NSW Government regarding development in the REZs and more effective, respectful engagement with rural communities; and		28.06.22 – to be commenced 06.07.22 – yet to be commenced
	4. Meet regularly with other nearby councils impacted by the Central-West Orana REZ, including Dubbo Regional Council, Gilgandra Shire Council and Mid-Western Regional Council to share their REZ experiences and how to best protect the interests of local government and communities.		28.06.22 –commenced, meeting held 29 June 2022.

Date of Council Meeting & Resolution No.	Resolution	Responsible Officer	Progress Report
16 June 2022 **344/2122** Doc ID 154362	**Item 22.3 Support and Maintenance End User Support Agreement** **344/2122 RESOLVED** that Council enters into the Support and Maintenance End User Support Agreement 1 July 2022 to 30 June 2023 with Tamworth Regional Council for the provision of Information Technology services.	**DCCS**	30.06.22 – Complete

30-Jun-22

Operating Expenditure Revote Report

WO	Description	Funding Source	Externally Funded %	Revote Amount $	2021/22 Expenditure	Budget Remaining $	Comment
	Community						
2231	Community Events	Drought Communities Funding		13,783	8,717	0	Project Completed
2240	Coolah Community Hall Development	Drought Communities Funding		104,000	61,716	42,284	Works being carried out by community group. Extension approved to end of September 2022.
			Sub-Total	**117,783**	**70,433**	**42,284**	
	Town Planning						
1499	Landuse Strategy Review	Council funded - well underway		89,536	4,442	85,094	Reclassification of Land Planning Proposal passed Gateway, public hearing and exhibition phase to be commenced. Complete LEP Review process will not be finalised by EOFY and will flow over into 2022/23. DPE to assist Council to prepare LEP Planning Proposal to outline changes required to LEP. Remaining budget will be required.
			Sub-Total	**89,536**	**4,442**	**85,094**	
	Tourism and Development Services						
2257	Dark Sky Awakening Festival	Grant		17,500	17,500	0	10/5/22 Event held. Completed
			Sub-Total	**17,500**	**17,500**	**0**	
	Property And Risk						
2003	Management Plan for Crown Lands	Grant		35,000	35,000	0	Works in progress. Crown Lands has requested review of categorisations of some fo the Crown Reserves. Council has paid the consultant for the work done and there is no further funding to be carried over. The project is essentially complete however Crown Lands after the fact have asked us to reconsider a few proposed categories that we will assess and respond to.
			Sub-Total	**35,000**	**35,000**	**0**	
	Youth Related Activities						
2204	Youth Activities - Building Local Pathways for Rural Young People in ongoing drought affected communities	Drought Communities Funding		20,638	5,159	0	Project Completed
2499	NAIDOC Week	Grant		2,058	141	1,917	Funds to be spent by 30 June 2022, including Sandstone Caves trip, potential date 28 or 29 May 2022, after Sorry Day.
2593	Drug & Alcohol Community Action Plan	Grant		10,000	4,423	5,577	Grant still to be expended. Invoices still to be paid
			Sub-Total	**32,696**	**9,723**	**7,494**	
	Total Operating Expenditure Revote		**Total**	**292,515**	**137,098**	**134,872**	

Capital Expenditure Revote Report

WO	Description	Funding Source	Externally Funded %	Revote Amount $	2020/21 Expenditure	Remaining $	Comment
	Communications And IT						
1296	Point to point wifi Coona Office	Grant refer restricted assets		157,343	0	157,343	Technological advancements now allow for fibre internet services, which are scheduled to be installed at Coolah and Coonabarabran before 30 September 2022. This solution to connectivity at Coolah wasn't previously cost-effecitve. Remaining funds to be redirected to the upgrade of Council's telecommunications (Mitel).
			Sub-Total	**157,343**	**0**	**157,343**	
	Tourism and Development Services						

2233	Digital Signage at Coonabarabran VIC - installed	Grant		2,330	1,136	0	10.3.22 Complete, project finished slightly under budget. Remaining budget not needed and can return to General Fund.
2590	Security Cameras at Vic Centre	Grant		15,013	3,457	0	2/6/22 All Cameras are installed, project complete. Remaining budget can be returned to General Fund.
			Sub-Total	**17,343**	**4,593**	**0**	
	Town Planning						
2377	Coonabarabran Bypss Planning Proposal	General		20,000	0	20,000	Will not be completed during FY21/22, and will require carry over to FY22/23; to be progressed further when resources are available
2378	DCP Planning	General		20,000	0	20,000	Project brief under preparation for consultant to assist with the review. Project will not be complete by 30/6/2022 and will need to carry across to 2022/23 FY; to be progressed further when resources are available
			Sub-Total	**40,000**	**0**	**40,000**	
	Developer						
1915	Contributions Plans - from Developer Contributions	General		13,071	5,790	0	9/2/22 Complete, project finished under budget. Remaining budget not required and can return to General Fund.
			Sub-Total	**13,071**	**5,790**	**0**	
	Horticulture						
1976	Baradine Skate & Activity Park construction	St Comm Fund - $ Club grant $27,000		32,081	32,081	0	Works completed.
2324	Coonabarabran Skate Park - Irrigation	General		29,721	8,356	21,365	Two coat sealing of carpark area near bike pump track to be carried out. Balance required in full to complete the works by September 2022
			Sub-Total	**61,802**	**40,437**	**21,365**	
	Local Roads M&R						
2314	Local-Bridges & Culverts-Cobborah Rd	R2R Funding		55,003	20,927	34,076	Works completed. Surplus funds to be reallocated to other R2R funded works thereby reducing council's contribution.
2456	Local-Rehab-Bugaldie-Goorianawa Rd	FLR Funding		27,900	14,224	13,676	Works completed. Surplus funds being FLR cannot be reallocated to other projects. If FLR projects are underspent, council contribution is used first then the FLR grant. Unspent FLR funds must be returned to TfNSW.
			Sub-Total	**82,903**	**35,151**	**47,752**	
	Ovals						
1309	Robertson Oval - Amenities refurbishment (Canteen & Toilets)	General		27,368	0	27,368	Works in progress. Project likely to be complete in May 2022. These funds contribute to WSC contribution to Grant Funds under BBRF Agreement
2081	Robertson Oval - Amenities refurbishment (Disabled Access)	General		7,429	7,429	0	Works in progess. Carryover funds expended.
2232	Mendooran Sports Ground Fence	DCF 2		44,970	0	44,970	Original scope of works completed. Seating and shelter to be installed. Balance required in full to complete works by September 2022
2264	Basketball Court Refurbishment - Coonabarabran	DCF 2		58,585	58,585	0	Bollards for carpark area installed. Works completed.
2325	Binnaway Oval-Irrigation Upgrade	General		1,400	1,400	0	Works completed.
2326	Baradine Ovals Toilets - Renewal of Tiles Fixtures Storage	General		26,000	26,000	0	Carryover funds expended.
2451	Coonabarabran Sports Complex Improvements	Grant		10,998	8,818	2,180	BBQ to be installed.
			Sub-Total	**176,750**	**102,232**	**74,518**	
	Property And Risk						
1236	Roof Repairs - Coona Office	General		62,500	62,500	0	Works completed.
1837	Coonabarabran Sport & Rec Centre	General		2,000	2,000	0	Works completed.

1858	Coonabarabran Office - Recarpet older section	General		47,647	47,647	0	Works completed.
2046	Road acquisition at Binnaway Camp Ground - Survey cost	General		2,932	0	2,932	Works in progress - advice to be provided to Solicitors on objections.
2082	Community Services Building Upgrades	General		15,000	3,850	11,150	Quotations obtained for carpeting.
2086	Mendooran Depot - Toilet Refurb	General		4,353	4,353	0	Works completed.
			Sub-Total	**134,432**	**120,350**	**14,082**	
	Public Halls						
2236	Painting Exterior Baradine Memorial Hall	DCF 2		46,520	26,742	19,778	Original scope of works completed. Variation approved to use remaining funding to address acoustics. Airconditioning and accoustics work completed, awaiting invoices. Balance required in full to pay invoices by September 2022
2449	Baradine Hall Roof Replacement	Grant		22,371	9,316	13,055	Original scope of works completed. Balance required in full as the invoices mentioned above (part of WO2236).
			Sub-Total	**68,891**	**36,058**	**32,833**	
	Public Swimming Pools						
1661	Dunedoo Roof Modifications Amenities Block (Polycarbon)	General		22,200	0	22,200	Funding received under LRCI Phase 3 for new amenities block. Funds to be used towards this project.
2332	Coonabarabran Pool-Concrete Infill-Underwater Lights	General		40,000	13,400	0	Works completed. Surplus funds may be returned to the general fund.
2333	Dunedoo Pool-Backwash Water Connection to Sewer	Grant		10,001	101	9,900	Works completed. Surplus grant funds will be used to offset overexpenditure on other projects funded from drought stimulus funding.
			Sub-Total	**72,201**	**13,501**	**32,100**	
	Regional Roads M&R						
2423	MR55 Rehab-near Black Stump Rest Area-Seg535455	Grant		826,443	694,168	132,275	Works completed. Project completion report approved. Final claim submitted. This project funded under the REPAIR program and FLR. Under these grants, Council is required to expend its money first and any underspend must be returned to TfNSW.
			Sub-Total	**826,443**	**694,168**	**132,275**	
	Town Streets						
1332	Drainage Study, Bowen Oval, Goddard & Martin St	General		16,000	16,000	0	Works completed.
2346	Crane st Rehab	General		49,721	0	0	Works completed
2357	Cowper St-Open Channel Construction	General		46,000	58	45,942	Works to be completed end of September weather permitting
2358	Belar St - New K&G	General		50,000	22,684	27,316	Road shoulder works in front of new kerb & gutter to be completed in October 2022 with next reseal program.
2360	John St - Footpath	General		6,000	0	0	Works no longer proceeding. Funds no longer required.
			Sub-Total	**167,721**	**38,742**	**73,258**	
	Waste						
2304	Waste Master Plan	General		7,488	2,284	5,204	Consultant's report has been completed recommending changes and upgrades. To be progressed further when resources are available, will not be complete this FY. Funds will require carry over to 22/23FY
2305	Landfilling Plan Development	General		20,000	0	20,000	To be progressed when resources available, will not be complete this FY. Funds will require carry over to 22/23FY
			Sub-Total	**27,488**	**2,284**	**25,204**	
	Warrumbungle Sewer						
983	C'bran - Pump Stations Renewal	Sewer Fund		8,715	8,715	0	Works complete, remaining funds to be spent on outstanding invoices
1571	Coonabarabran Sewage Treatment Plant Upgrade (RNSW 813)	50% funded		459,626	148,362	311,264	Concept design progressing. Project will be completed over next 3 years.

1576	Dunedoo Sewage Treatment Plant Upgrade (RNSW 811)	Approx. 75% grant funded		113,066	113,066	0	Concept design progressing. Project will be completed over next 3 years.
1577	Coolah Sewage Treatment Plant Upgrade (RNSW 812)	Approx. 75% grant funded		111,571	42,329	69,242	Packaged plant is an option, waiting on DPE feedback. Acquisition of land for new STP is also still an option, though land is proving difficult to locate. Project will be completed over the next 3 years.
2102	Baradine Sewerage Scheme Upgrade Scoping Study	75% funded		69,712	2,986	66,726	BP will be presented to Council in July, this will see the project completed. Outstanding invoice yet to be presented and paid.
2108	Effluent Reuse- Pivot Irrigator replacement	Sewer Fund		5,500	1,306	4,194	Complete, project finished, remaining budget will finalise outstanding invoice that needs to be lodged for the remaining budget amount.
2128	Binnaway - Sewerage	75% funded		97,996	4,772	93,224	Still no formal response received from DPE regarding risk rating and review of the project. Further email to DPE has been sent by external Project Manager yet to no available. Project unlikely to be completed this FY; remaining funds will be required to be carried over to 22/23FY
			Sub-Total	**866,186**	**321,536**	**544,650**	
	Warrumbungle Water						
535	Reservoirs - Rehabilitation	Water Fund		161,269	17,001	144,268	Site visits by contractor undertaken, quotes received and PO's issued, awaiting invoices to be presented. Unused funds can returned to General Fund after invoices presented and paid.
1358	Telemetry Upgrade Water (All Towns)	75% funded		341,554	341,554	0	Project progressing along well. Project will extend into September 2022, remaining funds will cover remaining PO; and final invoices when received.
1896	Coolah - Chlorine room at bores	Grant		125,698	30,694	0	Complete, remaining funds need to be journalled to WO973 due to incorrect WO used.
1903	Baradine Water Treatment Plant- Renewals	Water Fund		30,471	6,624	23,847	Project will be incorporated into the new WTP, and funded 75% by DPE and 25% by WSC. Report to June Council Meeting on new WTP. Project expected to be undertaken across 2 years, funds to be carried over.
1904	Coonabarabran Water Treatment Plant Renewal	Water Fund		6,427	3,364	3,063	Complete, final invoices yet to be lodged for remaining budget amount
2070	Baradine clarifier replacement	75% funded		369,075	127,830	241,245	Project will be incorporated into the new WTP, and funded 75% by DPE and 25% by WSC. Report to June Council Meeting on new WTP. Project expected to be undertaken across 2 years, funds to be carried over.
2073	Coolah Water Supply Scheme Upgrades Scoping Study	75% funded		8,078	4,962	3,116	Scoping Study issued to CWT for review. Remaining funds will be needed to cover invoice from CWT.
2111	Coonabarabran Groundwater pipeline	100% Drought Stimulus		546,802	546,802	0	Contracted work completed. Remaining funds to be expended on further work to bore pumps, PO issued, awaiting invoices
2112	Coonabarabran WTP filter media replacement	Water Fund		77,768	77,768	0	10.3.22 Complete
2119	Reservoir cleans (shire wide)	Water Fund		11,281	11,281	0	8.11.21 Complete
2120	Reservoir upgrades - WHS, C18, fencing (shire wide)	Water Fund		49,000	35,337	13,663	Site visits by contractor undertaken, quotes received and PO's issued, awaiting invoices to be presented. Unused funds can returned to General Fund after invoices presented and paid.
2258	Bores Condition Assessment - Shire wide	Water (Council contribution to 75% funded OWUA project)		61,390	289	61,101	Council has put forward 3 bores for assessment to OWUA. Awaiting confirmation of this request and subsequent works to be conducted. Project not expected to be completed this FY.
2374	Reservoir Upgrades - Internal Structures (Shire Wide)	Water Fund		70,000	63,636	6,364	Site visits by contractor undertaken, quotes received and PO's issued, awaiting invoices to be presented. Unused funds can returned to General Fund after invoices presented and paid.
2393	Binnaway Groundwater Investigation	Grant		262,309	9,189	253,120	New Bore site at Binnaway Creek to be developed first via yield and quality study, awaiting visit from driller. Not expected to be completed this FY.

2394	Mendooran Groundwater Investigation	Grant		66,167	5,483	60,684	Funds will be required to be carried over in 22/23FY, to be utilised on upgrade works to Mendooran WTP as opposed to blend tank.
			Sub-Total	**2,187,289**	**1,281,813**	**810,471**	
	Total Capital Expenditure Revote		**Capital Total**	**4,899,863**	**2,696,655**	**2,005,851**	
	Total Operating and Capital Expenditure		**Total All**	**5,192,378**	**2,833,754**	**2,140,723**	

WO	WO Desc	Directorate	Funding	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20	2020/21	July -June 2021/22	Inception-to-date (ITD) Actual	Year-to-date (YTD) Actual	2021/22 Revote Amount $	2021/22 Budget (Original + Revote)	Budget Remaining (Budget vs YTD Actual) $	Future Budget Allocation 2022/23 - 2024/25	Past Year Budgets	Current Year 2021/22 Budget	Future Years Budget Allocation	Total Project Budget	Past Year Expenditure	Current Year 2021/22 Expenditure	Total Project Expenditure to Date	Total Project Budget Remaining	Expected Completion Date	Comment
1296	Point to point Wi-Fi Coona Office	Corporate Services	Grant refer restricted assets			4,425		52,826		0		57,251	0	157,343	157,343	157,343	0	57,251	157,343	0	**214,594**	57,251	0	**57,251**	**157,343**	30/09/2022	Technological advancements now allow for fibre internet services, which are scheduled to be installed at Coolah and Coonabarabran before 30 September 2022. This solution to connectivity at Coolah wasn't previously cost-effective. Remaining funds to be redirected to the upgrade of Council's telecommunications (Mitel).
701	CTF - Three Rivers Retirement Village	Executive	Grant							0		0	0	0	1,228,466	1,228,466	0	0	1,228,466	0	**1,228,466**	0	0	**0**	**1,228,466**	TBD	Matter is still subject to legal proceedings. Funding from Commonwealth Government secured; Council still in negotiations with State Government concerning state funding for the project.
2126	Pavement widening and rehabilitation MR55 (Black Stump Way)	Technical Services	Grant						269,854	727,045	0	996,899	0	530,146	1,330,146	1,330,146	0	996,899	1,330,146	0	**2,327,045**	996,899	0	**996,899**	**1,330,146**	18/06/2021	Works completed. ***This project was completed in 2020/2021 financial year and the revote was possibly to the wrong project. Believe it should have been to W/O 2423.*** ***Total Budget: $800,000*** ***Income: $400,000 Repair*** ***2019/2020 & 2020/2021 Expenditure: $996,900*** ***2021/2022 Expenditure: $0*** ***Overspend: $196,900***
1571	Coonabarabran Sewage Treatment Plant Upgrade (RNSW 813)	Warrumbungle Sewer	50% funded			2,104	22,785	71,276	96,680	19,716	139,756	352,317	139,756	459,626	1,459,626	1,319,870	0	212,561	1,459,626	12,000,000	**13,672,187**	212,561	148,362	**360,923**	**13,311,264**	30/06/2025	Concept design progressing. Project will be completed over next 3 years with future years budget allocations as follows: FY22/23 $500,000; FY23/24 $4,000,000; FY24/25 $7,500,000. Price increases in materials and resources see this project increasing in value.
1576	Dunedoo Sewage Treatment Plant Upgrade (RNSW 811)	Warrumbungle Sewer	Approx. 75% grant funded			1,734	23,928	20,899	44,186	34,249	112,878	237,874	112,878	113,066	1,551,563	1,438,685	0	124,996	1,551,563	7,000,000	**8,676,559**	124,996	113,236	**238,232**	**8,438,327**	30/06/2024	Concept design progressing. Project will be completed over next 2 years with future years budget allocations as follows: FY22/23 $2,700,000; FY23/24 $4,300,000. Price increases in materials and resources see this project increasing in value.
1577	Coolah Sewage Treatment Plant Upgrade (RNSW 812)	Warrumbungle Sewer	Approx. 75% grant funded			1,693	15,781	15,067	20,310	30,726	29,620	113,198	29,620	111,571	740,506	710,886	0	83,578	740,506	6,000,000	**6,824,085**	83,578	33,898	**117,476**	**6,706,609**	30/06/2025	Packaged plant is an option, waiting on DPE feedback. Acquisition of land for new STP is also still an option, though land is proving difficult to locate. Project will be completed over the next 3 years with future years budget allocations as follows: FY22/23 $500,000; FY23/24 $3,500,000; FY24/25 $2,000,000. Price increases in materials and resources see this project increasing in value.
1358	Telemetry Upgrade Water (All Towns)	Warrumbungle Water	75% funded			11,936	3,247	22,687	71,267	58,771	719,624	887,532	719,624	341,554	867,287	147,663	0	167,908	867,287	0	**1,819,864**	167,908	720,192	**1,679,172**	**140,692**	30/09/2022	Project nearing completion - expected completion and expenditure of all remaining funds by end of Sept 2022.
2111	Coonabarabran Groundwater pipeline	Warrumbungle Water	100% Drought Stimulus						2,975	138,516	1,894,987	2,036,478	1,894,987	546,802	2,056,802	161,815	0	141,491	2,056,802	0	**2,198,293**	141,491	1,908,206	**2,049,697**	**148,596**	20/08/2022	Contracted work completed. Remaining funds to be expended on further internal work to bore pumps, quotes currently being sought, and PO to be issued. Expected completion mid-August 2022.
2250	Coonabarabran Stop and Play	Technical Services	SCCF 3							0	234,962	234,962	234,962	0	278,137	43,175		0	278,137	80,000	**358,137**	0	237,261	**237,261**	**120,876**	30/11/2022	15/06/2022 – Project no 2022/04 was awarded to D&C Powerline Construction for $79,376.00 incl. GST
2248	Coolah Skate Park	Technical Services	SCCF 3/LRCI Phase 2							1,264	169,813	171,077	169,813	0	199,979	30,166		1,264	234,979	0	**236,243**	1,264	170,291	**171,555**	**64,688**	31/08/2022	Shade sail contract Project No 2022/02 was awarded to Central Industries for $43,131.00 incl GST. Variation approved. Variation Amount $12,193.50, Revised Price $55,324.50 incl GST
2415	Neilrex Road Sealing	Technical Services								54,735	1,028,166		1,028,166		1,600,000	571,834			1,600,000	0	**1,600,000**	0	1,042,416	**1,042,416**	**557,584**	30/06/2022	Completed. Council contribution (R2R) fully expended. Underspent grant (FLR) to be returned to TfNSW in the order of $50,000. There is no option to re-allocate unspent grant funds to another project.
2795	Purelwaugh Road Widening	Technical Services									13,997	0	13,997	0	3,000,000	2,986,003		0	2,700,000	300,000	**3,000,000**	0	226,601	**854,814**	**2,145,186**	31/08/2022	Curve 1 and Curve 2 Repair Program projects complete and under budget. There is no option to re-allocate the unspend Repair grant to the rest of the project. Contractor commenced on the next section of the widening project. On track. Total Budget - $3 million **Curves 1 & 2** Budget: $800,000 Repair Program Income - Repair - $400,000 - Block - $200,000 - Rosi - $200,000 **Upgrade 2 sections** Budget: $2.2 million Income - Rosi - $2.2 million
2591	Warkton Bridge	Technical Services	Grant Funded FLB								550	28,268	0	28,268	0	900,000	871,732		0	100,000	800,000	**900,000**	0	29,744	**29,744**	**870,256**	31/01/2023	Contractor started on site on 4 July 2022. On track.
	TOTAL	**Grand Total**		**0**	**0**	**21,892**	**65,741**	**182,755**	**505,272**	**1,065,022**	**4,343,803**	**5,087,588**	**3,301,640**	**2,260,108**	**15,369,855**	**6,568,215**	**0**	**1,785,948**	**14,304,855**	**26,180,000**	**43,055,473**	**1,785,948**	**4,630,207**	**7,835,440**	**35,220,033**		