

Warrumbungle Shire Council Improvement Plan

No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	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;	Short term actions	Resource requirements
328	All	Instrumentation		Process monitoring, automation and instrumentation project. *Council should strongly consider investing in online monitoring at all CCPs (A124& A258) *Consider implementing online monitoring of critical water quality parameters including (A212): - Raw water pH - Dissolved Solids			27 June 2019 Improvement Plan review meeting	A4	27-Jun	Very high	Manager Warrumbungle Water	28-Feb-20		31-Mar-20	Interim	In progress				Funding granted from Safe and Secure for scoping study of automation. Covers action 212 13/12/19: Consultant engaged and is coming on site next week	Receive audit report from consultant	
78	Baradin	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	28-Feb-20		31/03/2020	Interim deadline (review report and develop plan)	In progress	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); called water and filtered water NTU	Review report results, develop plan and seek funding for recommendations	Project management resource needed
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	28-Feb-20	19/20	31-Mar-20	interim	In progress	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	Chase contractor and organise site visit	
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	28-Feb-20		31-Mar-20	wait for HH2O	In progress	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	To be included as part of action 332 (replace fluoridation systems)	Consultant (NSW Health)
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	28-Feb-20	19/20	30-Jun-20		In progress	2016-10: (Section 2.1, p.4 of CWT report); CCP assessed by Bligh Tanner (Jan-16) but value not yet been lowered (currently	filter inspection? NSW Health, Mark Nave to follow up; Hunter H2O BWY report		Currently using emergency back up bores. Filter media inspection undertaken	Filter upgrade	
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	28-Feb-20	19/20	6-Mar-20	interim	In progress				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. HunterH2O to install individual filter analyser (only currently on one filter) 28/2/20: Dual turbidity meters to be	To be included as treatment plant upgrades. Waiting on project timeline for PLC. Liaise with HunterH2O on turbidity analyser.	
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	28-Feb-20		13-Mar-20	Interim (finish concept design)	In progress	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	Consultant to review report	Project management resource
195	Mendooran	Disinfection	Operations	Commence regular chlorine batch concentration monitoring.	4.5	Materials & Chemicals	CWT report May-15		May-2015	Very High	Supervisor Treatment	28-Feb-20		31-Mar-20		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 ops	To be investigated. Procedure to be formalised (including space for test to be recorded and frequency)	
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	Manager Warrumbungle Water	28-Feb-20		31-Mar-20		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 H2O	Following finalisation of ERP, stakeholder lists to be included in DWMS	

No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	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;	Short term actions	Resource requirements
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	28-Feb-20		13-Mar-20		In progress				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 to be installed and breathing apparatus to be provided. Upgrade project also to include.	Project management resource sought
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	28-Feb-20	19/20	30/05/2020		In progress	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	To be included as treatment plant upgrades		
24	Binnaway	Environmental	Minor works	· Redirect the drain flow from the soda ash/alum dosing room to the external alum bulk storage bund · 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 · Ensure the chlorine room ventilation complies with the requirements of Australian Standard AS2927 · Investigate if the forced ventilation fan needs to be larger to provide adequate ventilation	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	BIN012, BIN013, BIN014	2014	High	Supervisor Treatment	28-Feb-20	19/20	30/03/2020	had no due date	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 bund 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 324 13/12/19: Have received quotes, sizing to be confirmed. HunterH2O audit to be undertaken next week, HunterH2O to confirm requirements 28/2/20 - see update action 23	To be included as treatment plant upgrades	Project management resource needed	
26	Coolah	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	COH006, COH007, COH008	2014	High	Manager	28-Feb-20		28/02/2020		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) 28/2/20 - See action 77	To be included as treatment plant upgrades		
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	28-Feb-20		31/03/2020		In progress	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 quotes have been done. Electrician level for issue access	WHS representative to table at next committee meeting. Organise tagging for CBN Director to raise at senior level for issue access		
32	Kenebride	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	28-Feb-20	19/20	30/06/2020		In progress	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	Old reservoir to be demolished. Install signage and extinguisher. Extinguishers to be installed at all sites.		
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	28-Feb-20		31/03/2020	Interim (quote)	In progress	The reservoir ladder and support structure does not contain any of the following: · Fall arrest system · Cage · Lockable cover · Handrail around the outside edge		Structural integrity to be investigated further. Rest of action covered by action 333 WHS access upgrades (does not include structural integrity of support structure)	Get quote to replace tank with back up generator and demolition of existing. Consider as part of reservoir upgrade program. Include site		
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	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	BIN008, BIN015, BIN016, BUG010, COH011, MEN013	2014	High	Supervisor Treatment; Technical officer	28-Feb-20		31/03/2020		In progress	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		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	Safety site audit to determine what signage is needed	WHS Committee	
48	BUG, BAR, KEN	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 North	28-Feb-20		31-Mar-20	Interim	In progress	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.	Operators to install fence at Bugaldie. Review report and engage contractor to supply quote to fix bore integrity issues	Project management resource needed	

No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	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;	Short term actions	Resource requirements
50	BUG, BAR, KEN	Catchment & Abstraction	Investigation	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	28-Feb-20		20-Mar-20	Interim (Tech officer)	Not started	Can we obtain a list of private bores from DPI? Bruce Lamont to advise if DOI can give us a list (Doug 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.	Consider Media / comms for residents on importance of water security and contamination of bores,	
53	All	Distribution	Investigation	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; Technical Officer	28-Feb-20		30-Apr-20	Interim (Tech officer)	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.	Tech Officer liaise with consultant and investigate setting up register in council systems (Authority)	Consultant
68	Baradin	Clear water tank	Major works	Seal the clear water tank against vermin and contaminants. Install bunds around the chemical dosing systems.	3.1	Preventive Measures and Multiple Barriers	Hunter H2O Audit 2014	BAR010	2014	High	Supervisor Treatment	28-Feb-20		30/04/2020		In progress	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)	Bund to be installed, building modifications to be complete prior to installation.	
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	28-Feb-20		See data for action 61		In progress		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)	Liaise with WEARS to undertake reservoir inspections works at remaining 6 reservoirs.	Project management resource needed
139	Coonabarabran	Training		Train relevant staff in these procedures (rapid communication incident response) and maintain a record of training.	4.3	Corrective Action			Mar-2015	High	Manager Warrumbungle Water	28-Feb-20		Within 2 months of finalisation		Not started				Training once new plans are developed 13/12/19: Confirmed that development of ERP is to be undertaken as part of Hunter H2O NSW Health project. 20/2/20- Training to be developed		
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.	4.4	Equipment Capability and Maintenance	DPI Inspections	DPI MEN004	Jan-2019	High	Supervisor Treatment; Project Engineer	28-Feb-20		31-Oct-19	Interim deadline (engage consultant for)	In progress		to be made permanent, foam fill is a temporary measure that has already been		Vermin/bird proofing - complete (May 2019) Site has been cleaned up and	Recirculation to be covered by Mendooran Plant upgrade project	Project management resource needed
191	BAR, BIN, 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	Technical officer; Supervisor Treatment	28-Feb-20		30/04/2020	To undertake calibrations	In progress	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	Contractor to be engaged and date scheduled for works. Schedule to be set up in InfoXpert (for future calibrations) (Tech Officer to do when date of	
192	Baradin	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	28-Feb-20	19/20	30/06/2020		In progress	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		
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	28-Feb-20		31-Jan-20		In progress		DWQ Monitoring Plan		13/12/19: Consultant has provided a proposal to develop verification proposal	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.	5.1	Drinking Water Quality Monitoring			Mar-2015	High	Technical Officer	28-Feb-20		28-Feb-20	Interim (was 31/10/19)	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;	Develop draft Water Quality Verification Plan with site locations (and photos).	Consultant	
210	Coolah	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.	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	COH004	2014	High	Supervisor Treatment; Technical officer	28-Feb-20		13/03/2020	Interim (review and update sheet)	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).	Dose to be recorded on sheet and calculation added. Supervisor and Tech Officer to review and update sheet.	
214	BUG, KEN	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	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	BUG005, KEN005	2014	High	Supervisor Treatment	28-Feb-20		6/03/2020		In progress	To ensure treated water quality complies with the Australian Drinking Water Guidelines (ADWG), water quality			Currently being undertaken 2-3/week. Chlorine analysers are installed, to	Review how to link analyser to shut pump down	Contractor

No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	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;	Short term actions	Resource requirements
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	28-Feb-20		30-Jun-20		In progress				28/2/20 - Wentworth Ave has been sealed, one spot still to be fixed (WEARS are coming back to be fixed)		Project management resource sought
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	28-Feb-20		31-Mar-20		Not started					To be included as part of ERP update (action 8)	Consultant (NSW Health)
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	28-Feb-20		30/03/2020	Interim	In progress	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	Gaps from NCF review. Then review with HR and supervisor WTP operator training plans. Review training	
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	Supervisor Treatment; Technical officer	28-Feb-20		31-Mar-20		In progress				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	Supervisors to take samples for the bore baseline sampling program. SS to assist with arranging samples. SS to create schedule (baseline and ongoing)	
271	BDN, CLH (MDN/ KBI7), 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	28-Feb-20		13/03/2020	interim (MDN certificates + check new bores)	Not started	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 DON, DON, MDN	Compile list and get quote (Supervisor Treatment)	
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	WarrumSCJul 18.4	Jul-2018	High	Supervisor Treatment	28-Feb-20		6-Mar-20	was 13/9/19	In progress				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.	To be investigated further Get calibration kit (low) Ring supplier	
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 DWQCM, Dec 2016			ORANA meetings pre October 2017	WarrumSCSept16.6	Oct-2017	High	Manager Warrumbungle Water	28-Feb-20		31-Dec-19		In progress				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	Project management resource sought
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	28-Feb-20		31-Mar-20		In progress				All the raw water from the bores has been tested (some radiological results outstanding). To be included as part of risk assessments (Hunter H2O NSW)	Risk assessment to include Pound Yard weir and bores	Consultant (NSW Health)
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	28-Feb-20		6-Mar-20	was 30/9/19	In progress				To be undertaken with mains replacement works (take off rising main) 13/12/19: Works are being undertaken currently		
326	All	Disinfection	Critical control point	Review CT for all systems			27 June 2019 Improvement Plan review	A2	27-Jun	High	Manager Warrumbungle Water	28-Feb-20		13-Mar-20		In progress				Refer to related actions 44, 46, 51, 60, 262, 309, 322 27/9/19: engaged CWT to review	Review CWT report and revise chlorination CCPs lower critical limit	
329	Binnaway	Disinfection	Major works	Chlorine room upgrade			27 June 2019 Improvement	A5	27-Jun	High	Supervisor Treatment; Project	28-Feb-20	19/20	28-Feb-20	interim (HunterH2O advice)	In progress				Quotes received, to include chlorine room upgrade	To be included as treatment plant upgrades	management resource needed
330	Binnaway	entailment	Major works	Investigate restoring bank integrity of sedimentation lagoons (e.g. relining lagoons)			30 July 2019 Improvement Plan review	A6	27-Jun	High	Supervisor Treatment	28-Feb-20		31-Mar-20	interim	In progress				Requested advice from HunterH2O 27/9/19: asked CWT for advice, who provided advice - next stage: ?	Review previous advice and consider options	

No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	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;	Short term actions	Resource requirements	
332	All	Fluoridation		Replace fluoridation systems and staff training			27 June 2019 Improvement Plan review meeting	A8	27-Jun	High	Manager Warrumbungle Water	28-Feb-20	19/20	31-Dec-20		In progress				13/12/19: Confirmed to be undertaken as part of Hunter H2O NSW Health project. 28/2/20: Internal meeting today with Health on design. Scheduled a workshop in March to present desing		Consultant (NSW Health)	
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	28-Feb-20	19/20	28-Feb-20		In progress				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 undertake inspections/cleans for remaining reservoirs. 28/2/20: Circular 18 submitted January 2020.	To arrange quote to get WEARS to undertake reservoir inspections/cleans for remaining 6 reservoirs.		Project management resource needed
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)			27 June 2019 Improvement Plan review meeting	A10	27-Jun	High	Manager Warrumbungle Water	28-Feb-20		30-Jun-20		Not started				External project 13/12/19: Consultant has provided proposal to review and update DWMS 28/2/20: To update follow the risk	Review proposal to review and update DWMS		Consultant
335	Coonabarabran	Disinfection		Review location and replace safety shower and eyewash for chlorine room			30 July 2019 Improvement Plan review	A11	27-Jun	High	Supervisor North	28-Feb-20		6-Mar-20	was 30/9/19	In progress				Met with safety officer to review location and determine number of safety showers.			
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	A12	27-Jun	High	Technical Officer	28-Feb-20		20-Mar-20	Interim (register)	In progress				27/09/19: SS prepared draft checklist (16/08/19); locations need to be added; created carbon copy	SS to add remaining locations and check with Supervisors		
337	All			Ensure appropriate confined space signage is in place			27 June 2019 Improvement Plan review	A13	27-Jun	High	Supervisor Treatment	28-Feb-20		30-Apr-20		In progress				Consultant to be engaged to develop register: 27/9/19: consultant cannot start			
338	Dunedoo	Reservoirs		Replace Rhodes Street reservoir roofs (reservoir rehabilitation project)			27 June 2019 Improvement Plan review	A14	27-Jun	High	Manager Warrumbungle Water, Supervisor	28-Feb-20	19/20	4-Oct-20	interim (engage WEARS)	In progress				27/9/19: waiting on WEARS quote; need to provide them design of Bullinda St roof	Engage contractor		Contractor
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)			30 July 2019 Improvement Plan review meeting	A15	Jul-2019	High	Manager Warrumbungle Water, Supervisor	28-Feb-20		28-Feb-20	Interim	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 progress	Compile existing SWMS Compile existing SOPs Develop list of required SOPs (including those to		Consultant
199a	Baradine	Safety/Signage	Minor works	Install appropriate signage on the chemical dosing systems (tanks or walls adjacent to tanks) showing the name, volume, UN number, classification and hazards of the dosing systems	4.5	Materials and Chemicals	Hunter H2O Audit 2014	BAR009, BAR012	2014	High	Supervisor Treatment, Technical Officer	28-Feb-20		31/01/2020	Interim was 31/08/19	In progress	· Chemical signage on the Soda Ash and PACL dosing systems is not installed on either the dosing systems or access to the compound · The dosing tanks and equipment are not tagged and locked out			Investigating to confirm requirements (against safety requirements) 27/9/19: AM check BDN for signage (PACI needed) and SDSs 13/12/19: Supervisor to progress	To confirm with WHS officer		
40a	BDN	Catchment & works	Minor Abstraction	Concrete capping of bores	3.1	Preventive Measures and Multiple Barriers	Risk assessment	1.03	Mar-2015	High	Supervisor North	28-Feb-20		31-Jan-20	was 30/9/19 (new 15/10/19 DDO)	In progress	DDO bore has been sealed; BDN being capped; Note: <b>no concrete</b> was used to cap			Baradine to be capped (ID 4 of project plan) Other bores have already been capped/covered. 13/12/19 - contractor has been engaged to cap bore at Baradine 28/2/20: Works still to be undertaken. Oriana project to review and fix bore casings.			

No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 27/8/2019; 27/09/2019; 13/12/19;	Short term actions	Resource requirements	
40b	Dunedoo	Catchment & works	Minor Abstraction	Sealing well at Dunedoo	3.1	Preventive Measures and Multiple Barriers	Risk assessment	1.03	Mar-2015	High	Supervisor Treatment	28-Feb-20		28-Feb-20		In progress				13/12/19 - Engage WEARS to seal well 28/20/20: Final desing needed to confirm costing	Engage WEARS to seal well at Dunedoo	Contractor	
341	All	All	Document / Protocol	Develop Emergency Response Plan (ERP), including: *Review and finalise ERP in DWMS Implementation Report (2016)(A232) * Establish a rapid communication system to deal with unexpected events (A138 & 223)					Feb-2020	High	Manager Warrumbungle Water	28-Feb-20		31-Mar-20		In progress				28/2/20: Confirmed that development of ERP is to be undertaken as part of Hunter H2O NSW Health project.	To be included as part of ERP update (action 341)		
342				Undertake an exercise of the incident response plan with PHU following finalisation of ERP (A232)					Feb-2020	High	Manager Warrumbungle Water	28-Feb-20		30-Jun-20		Not started				28/2/20: New action created, to be undertaken following completion of 341 (ERP)			
343	All			Development of document to undertake regular reservoir inspections: *develop reservoir SOP (specific 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)					28-Feb-20	High	Manager Warrumbungle Water	28-Feb-20				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.	Follow up with WEARS	Project management resource needed	
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	28-Feb-20		31/4		In progress				Quarterly review meeting to cover water quality obligations, alternate staff attendance at meetings. 28/2/20: To consider scheudle of to er-implement water quality meetings	Re-implement quarterly meetings (after finalisation of improvement plan). Process to be formalised in updated DWMS (Action 334)		
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	2.1	Water Supply System Analysis	Hunter H2O Audit 2014	BIN009	2014	Medium	Supervisor Treatment	28-Feb-20	20/21	30/06/2021		Not started	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			
20	All		Document / 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)	2.3	Hazard Identification & Risk			Sep-2015	Medium	Manager Warrumbungle Water	28-Feb-20		TBC		In progress				Review of risk assessment to be undertaken as part of NSW Health		Consultant (NSW Health)	
22	Coolah	Safety works	Minor	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	2.3	Hazard ID and Risk Assessment	Hunter H2O Audit 2014	COH009, COH010	2014	Medium	Supervisor Treatment	28-Feb-20			6/03/2020		In progress				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. 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	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. Signs to be installed following delivery Investigate portable eyewash station	
74	BWY, CBN, MDN	Sedimentation / Protocol	Document	Establish an Operational Control Point (OCP) for the settling lagoon	3.2	CCPs	Bligh Tanner report Feb-16		Feb-2016	Medium	Manager Warrumbungle Water; Technical	28-Feb-20		31-Mar	13/3 (long term trends)	In progress				2016-10: Undertake jar tests and confirm the appropriate coagulant dose; base change over between	Technical officer to prepare long term trends. Supervisor to propose OCP		

No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 27/8/2019; 27/09/2019; 13/12/19;	Short term actions	Resource requirements
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	27-Aug-19		31-Mar-20	Interim (finish concept design)	In progress		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)	Find funding following concept design finalisation (liaise with DPIE)	
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; Project Engineer	30-Jul-19		31-Oct-19		Not started		(Section 4.2.3, p.11)		To be investigated	Refer to action 88 and 171	
88	Mendooran	Disinfection	Investigations	Consider switching to chlorine gas disinfection.	4.1	Operational Procedures	CWT report May-15		May-2015	Medium	Manager Warrumbungle Water	30-Jul-19		31-Mar-20	Interim (finish concept design)	In progress		(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)	Refer to other action 171. Include pH and settled water investigations (action 87) Find funding following concept design finalisation (liaise with DPIE)	
89	Mendooran	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	27-Sep-19		31-Oct-19		Not started		(Section 4.3, p.17)		Schedules for Dunedoo still be developed. 27/9/19: waiting on Graham (flushing	Develop Dunedoo mains flushing schedules.	
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-19		31-Dec-19	Interim (priority and options) 31/12/2019	Not started				Identify reservoirs where this is required. Prioritise reservoirs (e.g. CT/population). Develop options for mixing. Reference Action 262		
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	13-Dec-19		31-Dec-19	Interim deadline	In progress		This should be covered in relevant SOPs (Repair a water main break. Replace a		SWMS has been developed for main repairs.	SOP to be developed for pipe break repairs (and	
112	Coonabarabran	Distribution	Documentation	Consider scouring program, including prioritisation of mains to be scoured	4.1	Operational Procedures	Risk assessment	10.03	Mar-2015	Medium	Manager Warrumbungle Water	13-Dec-19		31-Dec-19		In progress				Scouring types investigated. Need for scouring to be evaluated.	Need for scouring to be evaluated.	
116	Coonabarabran	Monitoring	Documentation	Develop formal monitoring protocols which identify target criteria for each of the preventive measures being monitored (including CCPs), monitoring records to be kept,	4.2	Operational Monitoring			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19		31-Dec-19		Not started				Schedules are captured currently on operational carbon copy books	Develop operational monitoring plan	
120	Coonabarabran	Catchment & Abstracts	Operations	Monitor raw water organics and nutrient loading.	4.2	Operational Monitoring	CWT report May-15		May-2015	Medium	Technical Officer	13-Dec-19		28-Feb-20	Interim deadline was 30/9/19 (review)	In progress		(Section 4.1, p.8), note: additional treatment processes may be required due to contamination through		Raw water quality assurance program in place (micro, chemicals) for all bores as part of NSW Health against this requirement	Review raw water assurance program	
121	Coonabarabran	Coagulation & Flocculation	Monitoring	Monitor algae concentrations in the raw water and sedimentation lagoon.	4.2	Operational Monitoring	CWT report May-15		May-2015	Medium	Supervisor North	13-Dec-19		5-Nov-19	was 30/9/19, start testing first week Nov	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.	Consider testing in the sedimentation lagoon	
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	13-Dec-19		31-Jan-20	Interim deadline was 13/9/19	In progress				Coonabarabran now (August 2019) recording chlorine residual testing of	Baradine monitoring flushing sheet to be	
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 North	27-Aug-19		30-May-20		In progress			2018-05: Safe and Secure EOI submitted for 'Automation and Process Instrumentation'. 2019-05: Automation Upgrade	Location changed to BDN Covered part of automation project (scoping study).	To be included as part clarifier upgrade or treatment plant upgrade	
140	BUG, DUN, KEN	Environment	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, DUN009, KEN006	2014	Medium	Supervisor Treatment	27-Aug-19		31/12/2019		Not started				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)	Investigate installing self bunded tanks (DUN, BUG, KEN)	
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	13-Dec-19		31-Mar-20	confirm with HH2O	In progress		(Section 4.2.2, p.10), remove by skimming and application of NaOCl liquid when required to prevent release		Cleaned on an annual basis (lagoon changeover) 13/12/19: Confirmed that	Cleaning to be included as part of maintenance schedules (Hunter H2O	Consultant (NSW Health)
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 North	13-Dec-19		31-Mar-20		In progress		(Section 4.2.5, p.15)		Scales are installed, not connected to SCADA	To be included as part of treatment plant upgrade (PLC replacement).	

No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	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;	Short term actions	Resource requirements	
166	Coona barabran	Fluoridation	Operations	Check service water for fluoride system is within required quality limits and softener is working effectively.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Medium	Manager Warrumbungle Water	27-Aug-19		30-Jun-20		In progress		(Section 4.2.6, p.16)			To be included as part of task 4 Hunter H2O NSW Health project		
167	Coona barabran	Fluoridation	Minor works	Modify fluoride saturator outlet pipework.	4.4	Equipment Capability & Maintenance	CWT report May-15		May-2015	Medium	Manager Warrumbungle Water	27-Aug-19		30-Jun-20		In progress		(Section 4.2.6, p.16)			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	13-Dec-19		31-Mar-20	confirm with HH2O	In progress				13/12/19: Confirmed that maintenance schedules is to be undertaken as part of Hunter H2O NSW Health project (Task 4)	To be included as part of task 4 Hunter H2O NSW Health project	Consultant (NSW Health)	
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	30-Jul-19		30-Sep-19		In progress				Considering changing to chlorine gas.	Part of Mendooran upgrade project (action)		
172	Mendooran	Documentation / Protocol	Document	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	27-Aug-19			Following H2O project to develop schedules	In progress		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).	Preventative maintenance program to be formalised for reticulation and reservoir.		
189	Binnaway	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	BIN006	2014	Medium	Supervisor Treatment	27-Aug-19		30/03/2020		Not started				Filter backwashes are only initiated by the filter run time setpoint regardless of the	To be included as part of treatment plant upgrade		
190	BAR, BIN,	Information / Protocol	Document	Identify critical equipment and develop procedures to maintain, repair and replace equipment as necessary	4.4	Equipment Capability and Maintenance	Hunter H2O Audit 2014	BAR003, BIN003,	2014	Medium	Manager Water; Supervisor South	28-Feb-20		1/01/2021	interim (list of spares South)	In progress	No current asset maintenance plan exists.			NSW Health project to include operation and maintenance	Identify current spares / replacement equipment at	Project Management	
196	All	Documentation / Protocol	Document	Confirm whether Council's supplier contracts include chemical quality compliance.	4.5	Materials & Chemicals			Sep-2015	Medium	Manager Warrumbungle Water	13-Dec-19		30-Jun-20		Not started				13/12/19: Contracts to be investigate	Contact appropriate person to get a copy of		
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	27-Sep-19			had no due date	Not started					27-9-19: GR to order equipment as required (SS can help if required)	Larger calibration tube to be installed	
225	All	Documentation / Protocol	Document	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	30-Jul-19				Not started					Include as part of DWMS review and update (action 334)		
226	All	Documentation / Protocol	Document	Review and update contact details listed in Table 10.	6.1	Communication			Jun-2015	Medium	Manager Warrumbungle Water	30-Jul-19				Not started					Include as part of DWMS review and update		
227	All	Documentation / Protocol	Document	Develop a comprehensive public and media communications strategy and include draft public and media notifications.	6.1	Communication			Jun-2015	Medium	Manager Warrumbungle Water	30-Jul-19				Not started					Include as part of DWMS review and update		
240	All	Training	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	7.1	Employee Awareness and Involvement			Jun-2015	Medium	Manager Warrumbungle Water	27-Aug-19		31-Dec-19	Interim	Not started				13/12/19: Previous quarterly water quality meeting have discussed	Confirm if position descriptions now include		
241	All	Documentation / Protocol	Document	Consider developing operators communication strategy	7.1	Employee Awareness and Involvement			Jun-2015	Medium	Manager Warrumbungle Water	30-Jul-19				Not started					Include as part of DWMS review and update (action 334)		
243	Mendooran	Training	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	Manager Warrumbungle Water; HR	13-Dec-20		30/03/2020	Interim	In progress		Referred to HR		Ongoing with HR 13/12/19: Currently reviewing competencies and aligning with national certification framework, processes to identify any shortfalls in training	Gaps from NCF review. Then review with HR and supervisor WTP operator training plans		
245	All	Training	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	27-Aug-19	Page 8 of 11	31-Jan-20		In progress				Process not yet formalised. Informal current process includes on the job	Formalise process following induction		



No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	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;	Short term actions	Resource requirements
247	BIN, BAR, MDN	Whole of System	Document / 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	30-Jul-19		20-Jun-20		In progress				Review on staff structure has been undertaken and revised structure is being implemented.		
248	CBN, BIN, MDN	Organisations	Training / Removal (catchment)	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	13-Dec-19		31-Dec-19		In progress	(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	Supervisors to review BGA plan onsite with operators	
251	All		Document / 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	30-Jul-19				In progress				Include as part of DWMS review and update (action 334)		
267	All		Document / 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	30-Jul-19				Not started				Include as part of DWMS review and update (action 334)		
268	All		Document / Protocol	Develop a records management process to ensure appropriate storage and accessibility of DWMS related records.	10.1	Management of Documentation & Records			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19				Not started				Include as part of DWMS review and update (action 334)		
269	All		Document / Protocol	Update details for existing documentation in the DWMS document register.	10.1	Management of Documentation & Records			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19				Not started				Include as part of DWMS review and update (action 334)		
270	ALL	Informations	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.	10.1	Management of Documentation and Records	Hunter H2O Audit 2014	BIN004, BUG002, COH002, DUN003, KEN002,	2014	Medium	Supervisor Treatment	27-Aug-19		31/10/2019		In progress	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.			Development of schedules covered under action 340. Calculations to be undertaken for chemical dose and usage rate (in conjunction with action 213)	Calculations to be undertaken for chemical dose and usage rate MDN calibration tube to be replaced	
287	All	Bores	Monitoring	Monitoring of ALL WSC bores be increased which includes: <input type="checkbox"/> Turbidity <input type="checkbox"/> pH <input type="checkbox"/> Microbiological <input type="checkbox"/> Temperature			July 2018 ORANA meeting	WarrumSCJul 18.1	Jul-2018	Medium	Technical Officer	13-Dec-19		28-Feb-20	Interim deadline was 13/9/19 (review RWQ)	In progress				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	Review raw water assurance program against this requirement see items 120, 253, 287, 313, 315)	
291	Mendooran	WTP	Document / 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	WarrumSCJul 18.5	Jul-2018	Medium	Project Engineer	27-Aug-19		31/12/2019		Not started					To be included as treatment plant upgrades	
292	Coonabarabran, Mendo	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,			July 2018 ORANA meeting	WarrumSCJul 18.6	Jul-2018	Medium	Supervisor Treatment	13-Dec-19		31-Jan-20	Interim was 30-9-19; now: 31/1/20 for algae	In progress				27/9/19: PAC has been dosed at Coonabarabran to control taste and odour issues; PAC dosing also improved filtered water NTU;	Confirm if tests were undertaken. Refer to action 121.	
294	ALL	Reticulation	Document / 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	WarrumSCMar 18.1	Mar-2018	Medium	Manager Warrumbungle Water	27-Aug-19		31-Dec-19		In progress	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: info needs to go on 205, 206 and 296. T-drive; some photos still need to be taken; sample sites require updating (+photos added) + incident flowcharts added	Undertaken in conjunction with action	
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	WarrumSCSept 16.2	Oct-2017	Medium	Technical Officer; Manager Warrumbungle Water	13-Dec-19		28-Feb-20	Interim deadline was 13/9/19 (review RWQ assurance program)	In progress				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	Review raw water assurance program against this requirement see items 120, 253, 287, 313, 315)	
315	CLH, MDN	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	WarrumSCSept 16.4	Oct-2017	Medium	Technical Officer	13-Dec-19		28-Feb-20	Interim deadline was 30/9/19 (review RWQ assurance program)	In progress				13/12/19: RWQ plan still to be reviewed for this requirement	Review raw water assurance program against this requirement see items 120, 253, 287, 313, 315)	

No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 27/8/2019; 27/09/2019; 13/12/19;	Short term actions	Resource requirements
319	Binnaway	Plant optimisation	Plant	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	27-Aug-19		1-Feb-21		In progress				To be further investigated	Request advice as part of upgrade project. Potentially using RO treatment for partial stream	
340	All			Development of WTP maintenance schedules			30 July 2019 Improvement Plan review meeting	A16	Jul-2019	Medium	Manager Warrumbungle Water; Supervisor Treatment	13-Dec-19		31-Mar-20	confirm with HH2O	In progress				Operation and maintenance schedules to be prepared by HunterH2O as part of NSW Health DWMS project. 13/12/19: Confirmed that maintenance schedules are to be undertaken as part of Hunter H2O NSW Health project.	To be included as part of Hunter H2O NSW health Project.	Consultant (NSW Health)
39	All	Document / 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	27-Aug-19		31-Dec-19		Not started				Risk assessment review to be completed as part of NSW Health DWMS project (Hunter H2)	Schedule to be reviewed as part of DWMS review and update (action 334)	
145	Coonabarabran	Document / 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	27-Aug-19		31-Dec-19		In progress				Asset register is updated annually following completed capital projects. 5 yearly evaluation of asset evaluations (last FY16/17)	asset management plan to be developed following IWCM finalisation and update of strategic business plan. Interim IWCM consultation.	
146	Coonabarabran	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 North	27-Aug-19		30-Jun-20		In progress				(Section 4.2.4, p.13)	Filter inspection undertaken.	To be included as part of filter media replacement
147	Mendocorn	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	27-Aug-19		31-Oct-19	Interim deadline	In progress				(Section 4.2.5, p.16)	To be upgraded to gas	
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	27-Aug-19		31-Dec-19		In progress				(Section 4.2.6, p.16)	Included as part of task 4 Hunter H2O NSW Health project	
194	Coonabarabran	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 North	27-Jun-19		31-Dec-19	interim	Not started	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	Check CWT for action details; get costs for soda ash to compare + investigate cost/requirements for change over	
224	All	Document / Protocol		Consider implementing a procedure in consultation with local hospitals to ensure dialysis patient details remain up to date.	6.1	Communication			Jun-2016	Low	Manager Warrumbungle Water	28-Feb-20		31-Mar-19	Interim	In progress				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	Refer to action 229 (obtain list of patients) Develop process for distribution and allocate responsibility of keeping document current. Add	

No	Location	Process	Category	Action	ADWG No	ADWG Element	Source	Haz ID / Source	Date added	Priority	Action Owner	Date reviewed	Funding	Due date	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;	Short term actions	Resource requirements
263	All	Document	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	Low	Manager Warrumbungle Water	27-Aug-19		30-Sep-19		In progress				In progress, no documents yet developed	Draft document	
264	All	Document	Protocol	Review existing documentation on the water supply systems and ensure all are captured on Council's document management system. Verify documents are up to date.	10.1	Management of Documentation & Records			Sep-2015	Low	All	27-Sep-19		31-Oct-19	was 30-9-19; revise next month	In progress				InfoXpert used as document management system. Incoming correspondents are documented. Staff have received training. Implementation still ongoing.	Water project information to be put on InfoXpert (all)	
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	27-Aug-19		TBC		Not started				Wait until NSW Health audit guidance is audits		