

# Drinking Water Quality Management Plan (DWQMP)

Annual Report  
2020/2021



**OUR COMMUNITIES**

**OUR FUTURE**

# Drinking Water Quality Management Plan Report

Western Downs Regional Council

SPID: 480

## 2020 - 2021

Details	Information
SPID	480
Postal Address	PO Box 551 DALBY QLD 4405
Telephone	07 4679 4000
E-mail	<a href="mailto:info@wdrc.qld.gov.au">info@wdrc.qld.gov.au</a>
Water Supply Schemes	Bell Chinchilla Condamine Dalby Jandowae Miles Tara Wandoan Warra

This report has been prepared in accordance with the Drinking Water Quality Management Plan Report Guidance Note.

## Table of contents

<b>1</b>	<b>Introduction</b> .....	<b>4</b>
<b>2</b>	<b>Summary of scheme/s operated</b> .....	<b>5</b>
<b>3</b>	<b>DWQMP implementation</b> .....	<b>9</b>
<b>4</b>	<b>Verification Monitoring - Water Quality Information and Summary</b> .....	<b>30</b>
4.1	Disinfection By-Products .....	30
4.2	Fluoride .....	41
4.3	Pesticides .....	41
4.4	Microbiology .....	57
4.5	Standard Chemical Analysis .....	59
<b>5</b>	<b>Compliance with Annual E.coli Rolling Annual Value</b> .....	<b>82</b>
<b>6</b>	<b>Incidents reported to the regulator</b> .....	<b>92</b>
<b>7</b>	<b>Customer complaints</b> .....	<b>97</b>
<b>8</b>	<b>DWQMP review outcomes</b> .....	<b>98</b>
<b>9</b>	<b>DWQMP audit outcomes</b> .....	<b>98</b>

## Table of Figures

<b>TABLE 1 – SUMMARY OF SCHEMES</b> .....	<b>6</b>
<b>TABLE 2 - PROCESS REVIEW</b> .....	<b>10</b>
<b>TABLE 3 - RESERVOIR CLEAN/INSPECTION PROGRAM</b> .....	<b>20</b>
<b>TABLE 4 - WATER QUALITY REVIEW DATA</b> .....	<b>23</b>
<b>TABLE 5 – RISK MANAGEMENT IMPROVEMENT PROGRAM IMPLEMENTATION STATUS</b> .....	<b>26</b>
<b>TABLE 6 - DISINFECTION BY-PRODUCTS</b> .....	<b>30</b>
<b>TABLE 7- FLUORIDE</b> .....	<b>41</b>
<b>TABLE 8 - PESTICIDES</b> .....	<b>41</b>
<b>TABLE 9 - MICROBIOLOGY</b> .....	<b>57</b>
<b>TABLE 10 - STANDARD CHEMICAL ANALYSIS</b> .....	<b>59</b>
<b>TABLE 11 - COMPLIANCE WITH ANNUAL E.COLI ROLLING ANNUAL VALUE</b> .....	<b>83</b>
<b>TABLE 12– INCIDENTS REPORTED TO THE REGULATOR</b> .....	<b>92</b>
<b>TABLE 13 –CUSTOMER COMPLAINTS ABOUT WATER QUALITY</b> .....	<b>97</b>

# 1 Introduction

This is the Drinking Water Quality Management Plant (DWQMP) report for Western Downs Regional Council (WDRC) for the financial year 2020 - 2021.

WDRC is a registered service provider with Service Provider Identification Number - SPID number 480. WDRC is operating under an approved DWQMP to ensure consistent supply of safe quality drinking water to protect public health. This is done through the proactive identification and minimization of public health related risks associated with drinking water.

This DWQMP report includes:

- The activities undertaken over the financial year 2020 - 2021 in operating our drinking water services
- Drinking water quality summary
- Summary of our performance in implementing our approved DWQMP

This report is submitted to the Regulator to fulfil our regulator requirement and is also made available to our customers through our website, [www.wdrc.qld.gov.au](http://www.wdrc.qld.gov.au) or for inspection upon request at Council offices.

## 2 Summary of scheme/s operated

The Western Downs Regional Council (WDRC) operates nine drinking water supplies within an area of 38,000 square kilometres. During 2020 - 2021 WDRC provided 3 365ML of potable water to more than 11 632 connections and maintained over 427km of reticulation mains.

WDRC's drinking water schemes utilise a range of different sources and infrastructure. Individual plants source their raw water from bores, dams and/or river systems. Treatment processes vary from plant to plant; region wide they include clarification, filtration and/or reverse osmosis desalination.

All networks are pressurised on demand by pumping stations and/or high lift towers. Water is disinfected with chlorine before entering WDRC's reticulation networks. Individual consumption is metered for all customers.

Table 1 – Summary of schemes

	<i>Water Source</i>	<i>Treatment processes</i>	<i>Treatment capacity</i>	<i>Length of Mains (km)</i>	<i>Towns supplied</i>	<i>Population</i>	<i>Connections</i>
<b>Bell</b>	Surface water - Koondaii Dam	Bell WTP - Aeration, flocculation, sedimentation, filtration, carbon dosing	<b>0.35ML/day</b>	<b>9.6</b>	<b>Bell</b>	<b>360</b>	<b>189</b>
	Ground water - Koondaii Bore x 2 Racecourse Bore (Emergency Supply Only) Warmga Bore						
<b>Chinchilla</b>	Surface water - Chinchilla Weir (Condamine River)	Process comprises, potassium permanganate dosing flocculation, clarification, ultrafiltration, UV sterilisation and activated carbon and fluoridation. <i>Activated carbon is only used during periods of blue-green algae outbreaks in the storage when pesticides are detected or other water quality issues for which carbon usage may be beneficial</i>	<b>5.04 ML/day</b>	<b>111.8</b>	<b>Chinchilla</b>	<b>5,490</b>	<b>3,175</b>
<b>Condamine</b>	Surface Water - Condamine Weir	Condamine WTP - Activated carbon ( <i>if required</i> ), flocculation, clarification, filtration, disinfection.	<b>0.5 ML/day</b>	<b>6.2</b>	<b>Condamine</b>	<b>210</b>	<b>121</b>
<b>Dalby</b>	Surface Water - Loudoun Weir on Condamine River	Dalby Water Treatment Plant Filtration plant- Rapid mix, flocculation/coagulation, sedimentation, activated carbon, filtration, disinfection, fluoridation. Alluvial 'A'-disinfection and fluoridation.  RO desalination- UV, multimedia filtration, cartridge filtration, 2 stage reverse osmosis, air stripping, blending/stabilisation/ pH adjustment, disinfection, fluoridation.	<b>10.8 ML/day</b>	<b>185.0</b>	<b>Dalby</b>	<b>11,020</b>	<b>5,409</b>
	Ground water - Alluvial 'A' Bores Alluvial 'B' Bores						

	<i>Water Source</i>	<i>Treatment processes</i>	<i>Treatment capacity</i>	<i>Length of Mains (km)</i>	<i>Towns supplied</i>	<i>Population</i>	<i>Connections</i>
		RO concentrate reprocessing-cartridge filtration, single stage RO, air stripping, blending, disinfection, fluoridation.					
<b>Jandowae</b>	Surface water - Jandowae Dams	Jandowae WTP - Aeration, flocculation, clarification, filtration, pH adjustment	<b>0.56 ML/day</b>	<b>27.4</b>	<b>Jandowae</b>	<b>1,100</b>	<b>485</b>
	Groundwater - Jandowae Bores	Bore water is not treated apart from aeration and disinfection prior to supply					
<b>Miles</b>	Surface water - Gil Weir on Dogwood creek	Miles- Filtration Plant - Aeration, flocculation, clarification, filtration, fluoridation	<b>1.6 ML/day</b>	<b>38.6</b>	<b>Miles</b>	<b>1,460</b>	<b>916</b>
	Groundwater - Miles Bore	Miles RO plant - Cooling, UV, Media Filtration, Cartridge Filtration, 2 stage reverse osmosis, blending, pH adjustment, stabilisation, disinfection	<b>417kL/day</b>				
<b>Tara</b>	Surface water - Tara Lagoons	Tara WTP A- Flocculation, clarification, Filtration	<b>500kL/day</b>	<b>24.1</b>	<b>Tara</b>	<b>1,150</b>	<b>484</b>
	Groundwater - Tara Bores 1 & 2	Tara RO Plant - Pre-treatment - chloramination, UV, Ultrafiltration, 2 stage RO, blending, pH adjustment, stabilisation	<b>360kL/day</b>				
<b>Wandoan</b>	Groundwater - Wandoan Bores 1 & 2	Train 1 Cooling, Aeration, flocculation, inclined plate sedimentation, filtration, and disinfection. <i>(Currently mothballed)</i> .  Train 2 Cooling, Aeration, KMNO4, BIRM media, and disinfection. <i>(Currently mothballed)</i> .  Train 3 Cooling, Aeration, Oxidation, flocculation inclined plate sedimentation filtration and disinfection.	<b>1.0 ML/day</b>	<b>20.4</b>	<b>Wandoan</b>	<b>500</b>	<b>384</b>
<b>Warra</b>	Surface Water - Warra Weir and off stream storage (Warra Dam)	Warra WTP	<b>200kl/day</b>	<b>4</b>	<b>Warra</b>	<b>150</b>	<b>72</b>

	<i>Water Source</i>	<i>Treatment processes</i>	<i>Treatment capacity</i>	<i>Length of Mains (km)</i>	<i>Towns supplied</i>	<i>Population</i>	<i>Connections</i>
		Ultrafiltration, pre-dosing with alum, potassium permanganate or powdered activated carbon is possible.					

### 3 DWQMP implementation

The actions undertaken to implement the DWQMP are summarised below.

The implementation of the Drinking Water Quality Management Plan (DWQMP) during the 2020 - 2021, is divided into the following categories:

- Process Review Program
- Reservoir Inspection
- Water Quality Review Data
- Risk Management Improvement Program

The following tables highlight the work undertaken within 2020 - 2021 for each of the mentioned programs.

Table 2 - Process Review

Date	Plant	Review Team:	Purpose of Review:	Specify:	Data Reviewed: (tick all that apply)	Other (please specify)	Review Undertaken	Identified Safety Issues:	Review Comments and Issues	Review Actions:
14/07/20	Chinchilla	TF, PA	Routine		Calibration Logs Internal Testing Data Online Process Log Operators Logbook Other	Daily log sheets	Plant Visit		Backwash lamella not performing well. Treated water turbid and not settling well. Lamella full of algae.	
22/07/20	Condamine	TF, AS	Routine		Calibration Logs Internal Testing Data Operators Logbook Other	DBP Analysis	Plant Visit		Plant has had inconsistent chlorine residuals 0.8 to 2.4 which have been unexplained. Residuals should be 1.5 mg/l approximately. pH and turbidity are okay. High DBPs detected as last sample round. Safety shower has no record of regular testing. Suggest use calibration book. Sheeting to be reinstated on filter and wall. Pump station switchboard to be cleaned out and filters cleaned or replaced. Blower oil checked. No2 transfer pump is well down on capacity - should be checked. Backwash pump requires bearing replacement. No1 raw water pump to be repaired. FCV 01 and FCV 02 to be repaired to operate electrically. Backwash valve indicates in reverse sense. Blower has been downrated a new backwash procedure development training of staff required.	<ol style="list-style-type: none"> <li>1) Blower service organised.</li> <li>2) Chlorine dose to be reviewed.</li> <li>3) New backwash procedures to be reviewed and implemented.</li> <li>4) Safety shower checked and logged.</li> <li>5) Intercell valve to be repaired.</li> <li>6) Backwash valve position indicator repaired.</li> <li>7) Backwash pump requiring replacement.</li> <li>8) Transfer pump 2 checked.</li> <li>9) Raw water 1 checked.</li> <li>10) Pump station switchboard cleaned.</li> </ol>
24/07/20	Tara	TF			Internal Testing Data Microbiological Report Other	Daily log sheets	Plant Visit		Reviewed surface water filter media replacement. RO plant operating satisfactorily but conductivity has risen. Remote access modem required reset. Occasional 2.0 free chlorine pre-RO. Network Cl2 high 2mg/l.	<ol style="list-style-type: none"> <li>1) Air scour blower to be set to 40HZ as interim backwash solution.</li> <li>2) Shut down plant if free chlorine pre-RO is 2.0 flush tanks.</li> <li>3) Remote access/alarm modem to be repaired or replaced.</li> <li>4) Reduce network Cl2 levels - to about 1.0mg/l.</li> </ol>
29/07/20	Chinchilla	TF, CT	Special (specify)	Special - Fluoride Review General Audit Resulted	Chemical Usage Records Internal Testing Data Network Testing		Plant Visit		Audit undertaken after fluoride training workshop. Fluoride room is dirty, with fluoride spillage and rodent faeces and dead frogs on a floor. Broom found in fluoride storage room. Mess and bucket also in room but uncertain whether they are used for other areas. PPE not being stored correctly. No maintenance cords or not used. Incorrect respiration cartridges in use. Fluoride tank mixer pump showing leakage on union. Significant mouse infestation - doors in plant need to be kept closed. Wall chart not being used to cross check fluoride powder weights. Relying on 0.02 times only. Old bag disposable is correct. No record of fluoride powder scale calibration being performed. MSDS did not seem to be readily available. No MSDS for activated carbon. Potassium permanganate being measured out in activated carbon room. Oxidation and explosion risk. Dust everywhere. Used containers nor disposed of. Unsure whether dust is PPU - AC or both. Considerable variation in fluoride calculated dose but no actions in many cases. Where are the PP additions recorded?	<ol style="list-style-type: none"> <li>1) Review storage options for PP.</li> <li>2) Clean out carbon room.</li> <li>3) PPE needs to be individually audited operated by operator (start again).</li> <li>4) Door closed policy on plant.</li> <li>5) Vermin traps set up.</li> <li>6) Review of MCC room elevated floor to check for mouse damage.</li> <li>7) Fluoride room to be cleaned out.</li> <li>8) All WDRC to go through refresher/competency training on fluoride, chem handling at least.</li> </ol>

Date	Plant	Review Team:	Purpose of Review:	Specify:	Data Reviewed: (tick all that apply)	Other (please specify)	Review Undertaken	Identified Safety Issues:	Review Comments and Issues	Review Actions:
06/08/20	Miles	CT, BF, TF	Routine		Internal Testing Data Microbiological Report Standard Chemical Analysis		Plant Visit		Basic Plant performance ok (surface and RO). Chlorine levels have been high in the network 2x pH generally stable 7.5. Turbidity 0.3. Conductivity 400. Network now 1 > 1.5 Cl2. Cl2 levels erratic. Cooling tower pH high SP. Some internal Fluoride test data missing. RO running okay - 3 days between bag changes, pressures, and flows good, filter antimicrobial flush completed a couple of weeks ago, temps 35 degrees Celsius. Filter plant okay. Leaking from launder cracks old clarifier need to be sealed/repared. Chemical supplies need to be topped up but not desperate. Spectraguard, 222, etc, Magnasol quotes next week, solar panels dusty. High lift pump station has ceiling insulation falling onto floor. ST70 dosing to be investigated. No obvious calibration records. Incorrect E. coli lab book used (new book available). Solar panels working okay, relatively clean. RO permeate pump being replaced. Sludge storages empty. Caustic line to RO to be completed.	1) Launder crack repair to be scheduled for budget to RMIP. 2) Chemicals quoted and ordered. 3) Pump station ceiling repaired. 4) ST70 dosing to be checked. 5) Hypo dose pump to be installed on bore feed tank to reduce biofouling. 6) Caustic line to be repaired. 7) Data on SWIM behind by a week or more.
13/08/20	Tara	TF, KW			Other	White Board Microbiological testing	Plant Visit		Bore 2 struggling to have enough capacity. Online process log not being updated. Operators process diary not being used correctly and not everything recorded. Lab and facilities need cleaning and reorganisation. Reservoir too low for end of week 51%.	Online process to be used, for recording process changes. Tidy and clean lab. Surface water plant should have been operated earlier on in the week. Bore 2 performance to be monitored. Stored membranes in MCC room to be repacked along south wall.
13/08/20	Warra	TF, KW	Routine		Other SCADA	Daily log sheets	Plant Visit		Plant operating okay. Not many records available at the time of visit. Hypo CIP had dirty cleaning solution. Pressures were okay. Compression may require services.	Source spare belts for compression and have on site. Change out date to be written CL17 reagents. Permanganate dose needs to be regularly checked as this has been variable causing higher turbidity.
31/08/20	Bell	TF	Routine		Calibration Logs Microbiological Report Operators Logbook Standard Chemical Analysis		Plant Visit		Plant has had a fluctuation performance over a couple of weeks with Cl and Turbidity swings. Settled water turbs have been 2-8 ntu and treated water has often been above 1 ntu. Chlorine appears to be running between 0 and 2.5 and pH has been high up to 8.4. What does Cl2 - mean in diary. Racecourse bore has been used automatically. Does not seem to be discrete water quality testing of bore after chlorination. Cause of turb and low chlorine. Many record gaps in SWIM. Rusting in clarifier becoming bad and requires repair. Operators' diary contains numerous notes about cleaning blockage, bleeding lines etc which suggests inconsistent dosing on flowrates. Hypo pump is to be lowered below tank. Shut off valve to be installed on the hypo tank. Excessive looping of caustic and Magnasol lines may be contributing to problems with chem dosing. Excessive restriction above flow meter may contribute to clogging on raw line (DN15). Comments about calibration of 21000 turb monitor being unable to calibrate. Seems to work okay. SDS book to be updated - NaOH and Magnasol to be added. "Caustic Acid" sign on chem line. CCP whiteboard not up and being used. Primary sludge pond almost full. Some in second pond. New C Key lock.	1) Hypo tank/pump to be rearranged so pump is below tank. Hypo tank to have outlet valve fitted. 2) Hypo, Caustic and Magnasol dose lines to be rearranged to avoid looping immediately after pump. 3) "Caustic Acid" sign to be replaced. 4) SDS to be updated to include NaOH and Magnasol 589. 5) Clarifier rust repair - refer to budget. 6) 2100Q calibration issue to be resolved. 7) Bore water tank outlet to be fitted with a test tap. 8) Free chlorine testing and dosing when bore online/offline to be confirmed. If chlorine is dosed into bore tank, testing of FRC and turb to be done prior to reservoir and levels recorded and managed. 9) Dosing of surface plant and bores is to occur separately if bores are being run independently. 10) CCP whiteboard to be installed and used. 11) DN15 section in raw water line to be removed. 12) Washout behind bore tank to be repaired. Causing the backwash pump to be buried, by mudslide. 13) Data needs to be entered into SWIM. 14) Staff to report unsatisfactory plant performance e.g.: 15th August and 21 August significant gaps and potential poor performance.

Date	Plant	Review Team:	Purpose of Review:	Specify:	Data Reviewed: (tick all that apply)	Other (please specify)	Review Undertaken	Identified Safety Issues:	Review Comments and Issues	Review Actions:
01/09/20	Miles	TF, BF	Routine		Internal Testing Data Microbiological Report		Plant Visit		pH is very stable 7.5. Turbidity good 0.3 - 0.5 in the network. Chlorine is okay 1.5 to 0.4 in network. Conductivity 400. RO plant needs CIP. Channels on clarifiers (particularly small unit) need to be cleaned. RO bag and cartridges are being changed 2-3 days and after filter backwashes. Heat exchange CIP about weekly. Cooling tower chemical skid dose pumps - maybe faulty. Little chemical being dosed sometimes tower water - okay but very close to high limits for pH, chlorides, and free chlorine. Sometimes unclear for chlorine. Cleaning of monitor probes on the 11/12th of August caused a step change in performance. Sludge discharges from clarifiers to be looked at with gradually reducing turbidity. Sampling generally up to date. Standard chem results not yet received.	1) Clarifier channels to be cleaned. 2) RO CIP. 3) RO pre-treatment hypo dose to be commenced. 4) Cooling tower chem dosing to be closely monitored and adjusted if necessary. pH 7-8. Cl2 0.5 to 1.0. Chlorides less than 300. 5) Review sludge discharges with lower turbidity.
04/09/20	Wandoan	TF, BF, AG	Routine		Flow & Power Logs Internal Testing Data Microbiological Report Network Testing		Plant Visit		Chlorine levels were trending low, and it was found that hypo lime was leaking, and one pump did not appear to be pumping correctly. This was repaired. Treated water had good turbidity, low iron, pH okay and chlorine levels were generally okay. Chlorine in tower 0.7mg/l. Tower being filled at about 10pm at night for approximately one hour. E. coli testing on track. Maintenance work on filters proposed in coming weeks - clean out filter media and top up anthracite. An inspection of cooling towers and bore changeover is proposed. Bore 1 gland leaking. Plant solar panels working okay but very dirty. Plant UPS to be checked and cleaned. Plant compressor is to be overhauled. SWIM data 2 weeks behind.	1) Chlorine dosing lines to be replaced/resolved. 2) Bore and gland adjusted. 3) Plant UPS to be cleaned as part of UFD maintenance program. 4) Compressor repair required.
07/09/20	Chinchilla	TF	Routine		Calibration Logs Internal Testing Data Microbiological Report Online Process Log Operators Logbook Standard Chemical Analysis				Treated water at the plant: pH 7.5 turb <0.2 Fluoride 0.6 > 0.9 Chloride 2.4 > 2.6 Network Chlorine: about 1.0 mg/L except Industrial Pak 0.4 mg/L. Plant operating okay with TMPs 70-80s. MC working okay. RC on both trains 2 weeks ago. LPG consumption continues to be an issue. MIT on train 1 is very high. Suspect a valve problem given that significant leakage into the backwash pit. Rodent issue potentially resolved but further mouse proofing required. Some calibrations still outstanding. Sludge valve leak is contributing to excess water in sludge lagoons. Sludge lagoons full. CWT is still offline. Plant has been operating with chem sump diversion valve open, but this should be closed except when a truck is unloading.	1) High/high in chem sump 2 to be investigated. 2) Diversion valve to be operated correctly. 3) Complete calibrations. 4) Complete mouse proofing. 5) Sludge and supernatant return to be optimised and valves repaired.

Date	Plant	Review Team:	Purpose of Review:	Specify:	Data Reviewed: (tick all that apply)	Other (please specify)	Review Undertaken	Identified Safety Issues:	Review Comments and Issues	Review Actions:
07/09/20	Tara	TF, AD	Routine		Internal Testing Data Microbiological Report Network Testing Operators Logbook Standard Chemical Analysis		Plant Visit		Reservoir level slowly declining. Surface plant offline. RO plant operating. Pressures and flows good. Array 1 182kpa PD. Array 2 104kpa. Check PV conductivity 300, 140, 120 pws/cm. Combined permeate 200. Bore 1 online. Approx. 1 MONTH since CIP but pressures are still good. Daily program of CIPs on UF and permeate flush on RO working well. Plant was operating at slightly too high recovery 81.5%. Adjust concentrate flow back to 1.1l/sec. 79.2% recovery. Should not exceed 80%. Plant operating at slightly higher than nominal design flow rate. Cartridge filters on blend lasting okay. RO plant reasonably tidy and clean. Antiscalant task requires a flush out. Surface plant revised backwash procedure okay. A couple of more test runs to go. Bore 2 to be tested for drawdown during operation. Airline to be pumped up and recorded regularly when in operation. Bore 2 head to be better sealed. Reservoir has been cleaned.	1) Drawdown on bore 2 during ops to be determined. 2) Bore 2 head to be sealed. 3) Chlorine residual to be maintained a little lower. Currently trending high 1.5 upwards in the network. 4) Flush out antiscalant tank. 5) Further testing of new backwash procedure required.
25/01/21	Chinchilla	TF	Routine		Internal Testing Data Network Testing Online Process Log Standard Chemical Analysis				Network Standard Chemicals 2 MONTHS behind. Network testing shows that turbidity is higher than preferred 0.3-0.5 ntu, pH- 7.9 & FRC 1.6-1.2. Permanganate dose may be able to be increased slightly from 4 to 4.1 to further reduce turbidity. UF backwash water very golden indicating PTC that same Mn is being oxidised on the UF membrane rather than all in the settling process. Testing on top of lamella to continue to determine if permanganate is carrying over. Maintenance clean history indicates that cleaning with hypo might be more effective than Citric. Both trains need scheduled recovery CIP. Reviewed Solar outputs - Going ok. Temporary TM CIP paperwork removed so a better picture of MIT decoy rates is now available. T1 is about 4. T2 about 1.5. Values and membrane integrity to be investigated. V1213 to be repaired or replaced. Chemical overflow sump full! Spill kit appears to be missing gloves. Kit to be cleared.	The following actions are required: 1) Both trains need Recovery Cleaning - Hypo may be most suitable 2) Chemical unloading sump to be pumped out and valve appropriately operated. 3) Chemical spill kit to be audited against checklist under the bin lid. 4) Valve 1213 to be repaired. 5) MIT results to be investigated. Bubble test observed. 6) At least daily checks for the presence of permanganate from top of lamella. If no carryover detected dose should be increased as required to control turbidity in treated water. 7) Hoses and pies for sludge handling when not being used to be rolled up and stored. 8) Network chlorine levels are trending high. Chlorine dose to be slowly reduced. 9) Treated water pH should be reduced slightly subject to no further permanganate carry over. 10) Plant to be mowed & kept clean

Date	Plant	Review Team:	Purpose of Review:	Specify:	Data Reviewed: (tick all that apply)	Other (please specify)	Review Undertaken	Identified Safety Issues:	Review Comments and Issues	Review Actions:
03/02/21	Warra	TF, LB	Routine		Chemical Usage Records Flow & Power Logs Internal Testing Data Microbiological Report Network Testing Operators Logbook Standard Chemical Analysis				System has had high DBP levels in the network and intermittent periods of turbidity around 1 NTU due to manganese. Network chlorine residuals have been inconsistent and between 0.3 and 2 mg/l in the last MONTH. When plotted on the whiteboard, the trends between chlorine and turbidity, roughly inversely follow one or other on a 7-day trend. This may relate to the changing of raw water pump duty. These pumps may have significantly different output causing over/underdosing of permanganate changing the chlorine demand and the amount of manganese being oxidised. Pot perm usage is inconsistent and its possible that the vat concentration is not consistent. Plant operating correctly but treated water, once chlorinated increases in turbidity. Backwash appears appropriate. Daily demand somewhere between 20 & 80 kl/day. Off stream dam treated with Captrol a few weeks ago.	1) Raw water pump duty changeover to be limited to once per MONTH 2) Batching of Pot perm needs to be consistent and precise. As far as possible batch a complete tank, rather than top u. 3) Dry citric acid bags to be stored in a bin with lid. 4) Dry caustic soda tubs to be sealed when not in use, and utensils stored appropriately. 5) 1720 E tub monitor to be cleaned internally. 6) Calibration of instruments to be recorded in a calibrator log, NOT IN THE PLANT LOGBOOK. Putting it in the logbook makes it impossible to find unless a calibration date in known. 7) Algae sampling from the dam to be undertake routinely.
05/02/21	Condamine	TF,SH,AS	Routine		Internal Testing Data Network Testing Other	Daily Log sheets	Plant Visit		Plant operating okay. Online settled water turb monitor repaired. Free chlorine levels inconsistent but not low. Turb and pH good. Large genset requires battery charge.	Maintain consistency of chlorine dosing to achieve good network residuals. Valve on high service pump set to be repaired to prevent receive. Genset battery charge. Diesel pump oil change.
15/02/21	Tara	TF, RK	Routine		Chemical Usage Records Internal Testing Data Network Testing Operators Logbook Other SCADA	SCADA logs, alarms etc	Plant Visit		Area around surface water sludge pumps to be cleaned up. Sludge leaking from sludge discharge pipework onto concrete walkway. Area barricaded. Chem unloading slab valves were in wrong positive. Surface water plant offline. Operators indicated that they had modified/ reduced air scour flow rate used during backwash as this allowed less backwash water to be used. This is in fact erroneous and backwash procedures as previously establish should be used. RO CIP frequency had reduced to 2 weekly. A front to back clean with PC11/DBNPA is required as well as a full caustic and acid CIP of the plant. pH 12 & 35degrees with an overnight soak. pH 2 and 35 degree with a 2-3-hour soak required. Bore tank to be drained out and hosed out prior to refill and dosing with DBNPA. Plant to be operated with permeate directed to waste. 125ft of water over pump in bore 2. When bore 2 is brought online daily air gauge reads to be taken to determine rate of draw down. Chlorine, pH, turbidity generally satisfactory although network FRC had trended to 1.8mg/l over the previous week. Drain pipework on bore tank had been repaired again. Suggested that either flexible pipe or another flex coupling be installed.	1) Area around sludge pumps to be cleaned up, leaves removed etc. 2) Leaves to be removed from chem slap sump. Valve operation tool to be modified. 3) Sludge pipe connection to sludge collection sump to be replumbed with CAMLOCKS removed. PVS pipe can be used but the ability to disconnected pipework to be included. Area to be cleaned up. Barricading to stay in place until repaired as area is slippery. 4) Previously established backwash procedure to be used. 5) Front to back PC11 clean to be performed and CIP as discussed earlier. 6) Bore tank drain pipework to be modified. 7) Daily reads of air gauge on bore 2 8) Monitor and control chlorine dosing to reduce frequency of high chlorine reads around the town. 9) Chem unloading bay valves to be operated correctly, with stormwater diversion open when no truck is present.

Date	Plant	Review Team:	Purpose of Review:	Specify:	Data Reviewed: (tick all that apply)	Other (please specify)	Review Undertaken	Identified Safety Issues:	Review Comments and Issues	Review Actions:
16/02/21	Dalby	TF, PP	Special (specify)	Special - Surface Water Ops	Internal Testing Data Online Process Log		Plant Visit		Surface water plant operation was reviewed during routine operations. Plant had started up cold after about a week offline. Raw turb approx. 20, settled water 1-2 ntu filtered about 0.5ntu. Some floc carries over occurring particularly basin 2. Dose rate based on pump settings was about 90mg/l as alum. This seemed high for the turbidity but with the short run there is little time to optimise the dose. Filtered water turbidity was higher than desired and was seemingly not improved by earlier backwash events. Backwash flow rate was not available.	1) Filter inspection required - see RMIP action. 2) Alum dosing calibration tube requires an internal tank isolation valve to make tube use easy. 3) Filter and backwash turbidity's to be closely monitored to assist with troubleshooting.
09/03/21	Warra	TF, LB	Special (specify)	Special - Turb, problems with high THM and permanganate	Internal Testing Data Network Testing Operators Logbook SCADA Standard Chemical Analysis		Plant Visit		Process review being undertaken because of sustained high THM's and problems with Mn turbidity being unable to be controlled. Dose rates of 15mg/l of permanganate being used but turbidity persists, and treated water is intermittently pink. Likely cause is inadequate time for the oxidation process to be completed. Algae die off in the dam likely cause of high chlorine and permanganate demand and re-release of Mn. Plant operating okay, but CIPs potentially being done too frequently given that the water has near zero biofouling potential.	1) Air stripping unit to be fabricated and installed into Tank 2 for trial removal of BROMOFORM. 2) Low level tanks to be inspected for Mn residue and cleaned as required. 3) UF plant to be operated in circulate mode as necessary to keep treated water reasonably free of oxidised Manganese. 4) Permanganate dose be reduced to the point where treated water is not pink but operated where Mn removal is maximised. Some turbidity will form after chlorination and further oxidation. Plant to be recirculated as in 3) above. 5) Once 1), 2), 3) and 4) above implemented, air-stripper to be commissioned and tested. Monitoring should determine if free chlorine is being unusually lowered by air stripping and any other impacts. 6) THM monitoring across all sample points for a few rounds to continue to check system performance. 7) Monthly TOC sampling from Dam and treated water. 8) Fortnightly algae count samples from Dam. 9) Trial dosing of small dose 10-30mg/l of alum at Dam dosing point to be set up. This is proposed to improve Mn capture and potentially absorb some DOC into the floc. 10) Trial dosing of small dose of N & OH 1-5mg/l to slightly raise pH to increase oxidation rates of permanganate to be established at Dam dosing point. 11) Flush of mains prior to THM sampling.

Date	Plant	Review Team:	Purpose of Review:	Specify:	Data Reviewed: (tick all that apply)	Other (please specify)	Review Undertaken	Identified Safety Issues:	Review Comments and Issues	Review Actions:
17/03/21	Chinchilla	Terry Fagg	Special (Specify)	FRC & pH excursions	Chemical Usage Records Flow & Power Logs Internal Testing Data Network Testing Online Process Log Operators Logbook SCADA		Plant Visit	Locked camlock caps not installed on hypo tank fill points. Bulk storage tank safety shower leaking. Two different Emergency Plans onsite.	Plant results for previous weeks shower a couple of higher than usual pH & FRC. Normal ops were about 7.8 pH & up to 3.0 FRC leaving the plant at CSP10. Spikes about 3 & up to 8.1 were noted. Plant is still running with treated water tank offline so there is less buffering of short-term process divergences. FRC seems to be on a general inclining trend & permanganate demand is also reducing. It is assumed that raw water organics & or the raw water manganese levels are also reducing. Turbidity good. Fluoride offline. Raw water turbidity slowly declining. Many online instruments require calibration. Lamella plated require cleaning. Contact tank feed pump to be reinstalled. Noted that valve 1213 repaired. Investigation of low MIT investigated. Significant improvement of management of hoses etc. Hypo truck unloading panel defective. Safety shower leaking. No evidence of chem spill kit audit being performed. Truck unloading bunk tanks full. UV system to be cleaned. UF recovery cleans performed with citric/phos with good results.	1. Plant & network free chlorine residuals to be lowered. 1.5x in the network is excessive. 2. Plant & network pH to be lowered to 7.5 3. Contact tank feed pump to be reinstalled. 4. Once feed pump is installed permanganate dosing to the raw water balance tank can cease & dosing at the exit of the Lamella can resume. Expect does of 0.5 mg/L. 5. Alum dose to be optimised given reduction in raw turbidity. 6. Calibration of pH & Turbidity online monitors. 7. Truck unloading panel (hypo) to be tested & repaired as required. 8. Spill kit to be audited. 9. Bulk storage safety shower still leaking. 10. Truck unloading bund tans to be emptied. 11. Hypo tanks to have tank fill line locking caps installed. 12. Lamella plates to be cleaned off. 13. Treated water tank to be refilled when roof reinstated. 14. New HMI to be implemented. 15. Area around phosphoric acid, citric acid, and Cal chloride to be cleaned up, pumps and tanks cleaned, camlock caps replaced, transfer pumps put away. etc.
30/03/21	Dalby	TP	Routine		Internal Testing Data Network Testing		Plant Visit		Short review of water quality and RO Plant performance RO2 and TI RO3 online. Operations were normal. Water quality was good, with WTP and Edward Street quality satisfactory. RO3 was running at 37% recovery inlet boost and system pressure pump speed was increased slightly to bring this back to about 40%. E. coli testing was not following the correct procedure. Sample bottles may not have been marked with time of collection but instead being labelled with time into the incubator. Dalby operators to be sent copy of procedure. Evap pad - logging okay - Manual tests performed - Pipeline tests documented	
06/04/21	Tara	TF	Routine		Internal Testing Data		Plant Visit		RO plant supplying 100% of the demand. Plant operating okay. Routine UF CIP being undertaking. Water quality very stable: Ph 7.5 - 7.6 FCR 1 - 1.5 TURB 0.1 CORD 500 Continuing concerns about Coojee Hypo deliveries. Tending to be late.	1) Antiscalant tank to be cleaned out. Build up pf "black" on the tank internal surfaces causes problems with antiscalant pups and product quality. 2) Caustic tank to be cleaned out 3) Caustic storage drum to be labelled. All chemical tanks to have appropriate labels and HAZCHEM diagram added. 4) Screens to be fitted to overflows. 5) Acid dosing shed to be rebuilt or replaced.
07/04/21	Miles	TF, CT	Special (specify)	Special - Not a full review	Internal Testing Data Network Testing Operators Logbook		Plant Visit		RO treated water and permeate storage tanks to be replaced. Plant operating okay, pH cartel at 7.5 was excellent but network chlorine levels (2T) was too high. RO doing most of the supply at time of visit but is close to requiring CIP. Operating pressures were boosted to improve permeate output. Leak around floor waste pipework. Leak around emergency network transfer flowmeter. Small clarifier draw valve requires manual operation. Torque tube had become very rusted.	1) Free chlorine levels in the network to be reduced by making small adjustments gradually. 2) Small clarifier valves to be repaired. 3) leaks on bore and floor meter to be repaired Floor waste may indicate pipe failure. Requires investigation with pipe 4) Plant CIP when necessary

Date	Plant	Review Team:	Purpose of Review:	Specify:	Data Reviewed: (tick all that apply)	Other (please specify)	Review Undertaken	Identified Safety Issues:	Review Comments and Issues	Review Actions:
07/04/21	Wandoan	TF, CT	Routine		Flow & Power Logs Internal Testing Data Microbiological Report Standard Chemical Analysis		Plant Visit		Repair of No1 bore drive bush. Bore is still useable at this stage, but repair required. Treated water aluminium levels were higher than required. 845888 doses to be confirmed at 10-15mg/L. Otherwise plant operating well. Network Tests show that Free Chlorine levels are too high at 1.2 -> 1.3 everywhere and should be reduced. E. coli testing not following procedure regarding marking bottles with time of collection. Bore 1 not yet required. cooling tower for bearings is overdue for lubrication and belt inspection to be cleaned. Water tower level control not working.	1) Chlorine dose to be reduced gradually over a couple of weeks 0.5 -> 0.7 mg is adequate in the network. 2) E. coli sampling to be as per procedure. 3) Water tower level controls will need to be inspected by electrician 4) the drive shaft bush requires repair on No 1 Bore. This will require the motor and plates and flocculate to be drained out and cleaned 6) Cooling tower to be greased, belt inspected, and packing hosed out.
11/05/21	Warra	Terry Fagg, Len Beck	Special (Specify)	Turb problems with high THM and permanganate trend	Internal Testing Data Network Testing Operators Logbook SCADA Standard Chemical Analysis		Plant Visit		Process review being undertaken because of sustained high THM's & problems with Mn; turbidity being unable to be controlled. Dose rates at 15mg/l: at permanganate being used but turbidity persists & treated water is intermittently pink. Likely cause is inadequate time for the oxidation process to be completed. Algae die off in the dam likely cause of high chlorine & permanganate demand & re-release of Mn. Plant operation ok but CIP's potentially being done too frequently, given that the water has near zero biofouling potential.	1. Air stripping unit to be fabricated & installed into Tank 2 for trial removal of BROMOFORM. 2. Low Level tanks to be inspected for Mn residue & cleaned as required. 3. UF plant to be operated in circulate mode as necessary to keep treated water reasonably free of oxidised Manganese. 4. Permanganate does be reduced to the point where treated water is not pink but operated where Mn removal is maximised. Some turbidity will form after chlorination & further oxidation. Plant to be recirculated as in 3. above. 5. Once 1. 2. 3. & 4. are implemented, air stripping to be commissioned & tested. Monitoring should determine if Free Chlorine is being unusually lowered by air stripping & any other impacts. 6. THM monitoring across all sample points for a few rounds to continue to check system performance 7. Monthly TOC sampling from Dam & Treated water. 8. Fortnightly algae count samples from Dam. 9. Trial dosing of small dose 10-30 mg/L of alum at Dam dosing point to be set up. This is proposed to improve Mn capture & potentially absorb some DOC into the floc. 10. Trial dosing of small dose of NaOH 1-5 mg/L to slightly raise pH to increase oxidation rates of permanganate to be established at Dam dosing point. 11. Flush of mains prior to THM sampling
12/05/21	Tara	TF, AW	Special (specify)	Special - Quick Review Only	Internal Testing Data Microbiological Report Operators Logbook				RO Operation only due to low demand. No2 Bore only since 4/05/2021 some changed in fouling being experienced. Ongoing fouling of UF with the daily maintenance clean unable to reduce pressures. Based on past results a citric / phosphoric acid clear should be tried. Antiscalant tank had been cleaned out. Recovery should be limited to 80% concentrate control value should be adjusted to show 1.1 L/ sec on FT702. E. coli samples had been taken and placed in incubator. However, incubator was not on. Sample to be replaced, temperature check etc. Samples to have collection times marked on the bottle. Water quality as plotted on whiteboard was good.	
26/05/21	Miles	TF	Special (specify)	Special - Not a full review	Internal Testing Data Operators Logbook		Plant Visit		Both plants operating okay. RO needs a CIP. Genset being operated at the time of visit. Filter plant UPS is faulty (won't take load with power off) ' RO plant alarms not working (Cited alarm engine working). Checked alarm setpoints on a part of the bag and cartridge filters 330 kpa and confirmed that this was below the design 450kpa.	1) RO CIP to be performed done 2) Filtration plant UPS to be repaired / replaced. 3) RO plant alarms to be investigated.

Date	Plant	Review Team:	Purpose of Review:	Specify:	Data Reviewed: (tick all that apply)	Other (please specify)	Review Undertaken	Identified Safety Issues:	Review Comments and Issues	Review Actions:
26/05/21	Wandoan	TF, AS	Routine		Internal Testing Data Microbiological Report Network Testing Standard Chemical Analysis		Plant Visit		Plant operating okay with water quality good. Some data behind and possibly some network testing behind schedule (internal only). Slightly rising trend in network free chlorine. Standby genset was test run but some confusion over procedures required. Genset and switch bore DSE controllers should be in auto and the system should run on a power outage. Genset fuelled up. Water tower leaking through overflow at 2.3kL/hr. tower is filling through leakage in the not return values. Tower quality is like the going to town. Small reservoir leaking through under drains at 1-2 kL/hr. E. coli: incubator thermometer did not match log sheet readings. Log sheet 37. Incubator thermometer barely 35.	1) Check incubator temp. 2) Confirm and test Genset controls. A full test run with new pumps required 3) overflow leak to be investigated / repaired. 4) Res leak to be investigated / repaired. Reservoir to be overhauled.
16/06/21	Jandowae	TF, LB	Special (specify)	Special - Investigate process change documents and hypo dose	Chemical Usage Records Flow & Power Logs Internal Testing Data Network Testing Operators Logbook		Plant Visit		Water leaking from tower overflow and reservoir underdrains - 5kl/ hour estimated. Plant operating well with good, settled water turbidity, generally below 2NTU. Filtered water about 0.3 NTU. Chlorine dose had been set up based on demand and achieving an end of reservoir. FCR about 2mg/l. Actual reading had reduced to 2.6mg/l so it's possible that the dose pump requires calibration. Plant offline so could not test. Plant tidy but needs a bit of a clean after wet weather. Incubator temperature to be monitored closely. Reservoirs exit E. coli is correct schedule. Exit FCR potentially too high, as network is above 1.0 everywhere.	1) check hypo dose pump calibrations 2) record all plant process changes in appropriate SWIM location, to allow remote access. Record what was done, new and old setting, who did it, when and why. 3) Monitor incubator temperature. Difference between SWIM record and thermometer. 4) Information about Coogee Chemical supply to be sent in.
16/06/21	Warra	TF	Special (specify)		Chemical Usage Records Internal Testing Data Online Process Log		Plant Visit		No new issues. Walkway stairs. Some chemical handling issues. Chemical storage issues at dam pump station. Quantities are small, but potentially sensitive area. No water supplies. Improved coagulant dosing system at am, to reduce raw water organic carbon. Algae control system in dam. Reviewed plant performance. Currently achieving about 75% UVT with coagulant. After THM sampling today coagulant does is to be increased 25% to check if UVT % increases. If it does then UVT % will be able to be used as a TOC Surrogate. Plant operating okay with coagulants. Backwash out 40 minutes internals still appropriate a maintenance cleans about twice per week. Dam slightly turbid 3 - 10 NTU and full. HACH instrument calibration will occur in next few weeks. FCR high everywhere. E. coli sampling at tower continues every day.	1) After THM sampling completed coagulant dose to be increased by 25%. About "250" 2) Free Chlorine needs to be better managed around the town. Chlorine dose to remain static so a demand baseline can be established, and acceptable chlorine dose calculated. 3) FR going into tower no longer required. 4) All changes and events to be logged in plant "Online Plant Log"
17/06/21	Chinchilla	TF	Special (Specify)	Special - not a full review	Internal Testing Data Microbiological Report SCADA Standard Chemical Analysis		Plant Visit		Hand railing and waste tanks have been repaired by adding another railing. MIT failures- with pipes being welded opportunity to look for another leak. Clear water tank back alive after liner repair. Weld and pipe failures in stainless steel is gradually being repaired with plant operating at night only. More complex repairs still to be done. A couple of valves of be replaced due to date, good flat trend SWIM data only one day behind. FCR is trending high because Chlorine dose was increased but has now 11/6 been decreased, so a small decline may come through system Turbidity quite good 0.3 -> 0.3 going to town. Chem waste pit okay. Problems with tower level controls one-week age. UVs to be cleaned.	1) After pipe repairs are completed, focus on MIT failures. 2) Sludge withdrawal was too low and started to carry over. 3) Rate to be monitored using jar setting tests

Date	Plant	Review Team:	Purpose of Review:	Specify:	Data Reviewed: (tick all that apply)	Other (please specify)	Review Undertaken	Identified Safety Issues:	Review Comments and Issues	Review Actions:
22/06/21	Dalby	TF,AW	Special (specify)	Special - not a full review	Flow & Power Logs Internal Testing Data Operators Logbook		Plant Visit		Plant operating well. Raw Turb 70-80 NTU. Filtered water 0.15 NTU. A substantial improvement from 2 - 3 weeks ago. Settled water about 2 NTU. Sludge dewatering was hampered by roadworks blocking access to sludge stockpile. Filter inspection still required. Tested - okay at current dose rate. Checked concentrate main recordings had been done. Did not see record of EPMH check.	

Table 3 - Reservoir Clean/Inspection Program

Scheme	Reservoir	Clean/Inspection	Comments
Bell	Low Level Storage	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to early <b>July 21</b>
	Elevated Low-Level Storage	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to early <b>July 21</b>
Chinchilla	Treated Water Low Level Reservoirs	<ul style="list-style-type: none"> <li>In-house inspection and clean January 2021</li> </ul>	
	High Level Tower	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to early <b>July 21</b>
	Low Level Industrial Park A	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to early <b>July 21</b>
	Low Level Industrial Park B	<ul style="list-style-type: none"> <li>OFF Line 2021</li> </ul>	
	Low Level Industrial Park C	<ul style="list-style-type: none"> <li>OFF Line 2021</li> </ul>	
Dalby	High Level Tower	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to early <b>July 21</b>
	High Level Tower 2	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to early <b>July 21</b>
Jandowae	Clear Water Tank	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to early <b>July 21</b>
	Low Level Reservoir	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to early <b>July 21</b>
	High Level Tower	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to early <b>July 21</b>
Miles	Clear Water Tank	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to early <b>July 21</b>
	Low Level reservoir 1 – Solar Panel Res	<ul style="list-style-type: none"> <li>Inspection &amp; Clean July 2020</li> </ul>	
	Low Level Reservoirs 2	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to <b>July 21</b>
	High Level Tower	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to <b>July 21</b>
Tara	Low Level Reservoir	<ul style="list-style-type: none"> <li>In House cleaned August 2020</li> </ul>	
	High Level Tower	<ul style="list-style-type: none"> <li>Harcan Marine Contractor - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to <b>July 21</b>

Scheme	Reservoir	Clean/Inspection	Comments
Wandoan	Low Level Reservoir Small	<ul style="list-style-type: none"> <li>Harcan Marine Contractor - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to <b>July 21</b>
	Low Level Reservoir Large	<ul style="list-style-type: none"> <li>Harcan Marine Contractor - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to <b>July 21</b>
Warra	Clear Water Tank	<ul style="list-style-type: none"> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to <b>July 21</b>
	High Level Tower	<ul style="list-style-type: none"> <li>In house clean and inspection March 2021</li> <li>Contractor Harcan Marine - Clean &amp; inspected July 2021</li> </ul>	The Contractor was scheduled to complete the works in <b>June 21</b> , however due to travel restriction that schedule had to be moved to <b>July 21</b>

Table 4 - Water Quality Review Data

Date	01/04/21	01/04/21	20/04/21	27/04/21	13/05/21	13/05/21	13/05/21	15/06/21	15/06/21	26/06/21	23/06/21
<b>Scheme1</b>	Tara	Bell	Dalby	Warra	Wandoan	Bell	Chinchilla	Tara	Bell	Warra	Dalby
<b>Sample Point1</b>	Test Point 8	Res Exit	WTP	Tank 4	Final Treated	LLR Exit	Colamba Street	Post Res 8	Res Exit	Best Park	DWR
<b>Water Quality Reviewed1</b>	Conductivity E.coli Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	Free Chlorine Residual Turbidity pH	Conductivity Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	Conductivity Free Chlorine Residual Turbidity pH	Conductivity Free Chlorine Residual Turbidity pH
<b>Comments/Actions1</b>	Very stable ops at the moment	FRC has been up and down. Av 2.5. Not certain that daily E.coli done. Email sent.	Conductivity varies as different processes came online			High FCR everywhere Contact Len		Last E.coli 12 days ago. Email sent		E.coli Highway gardens	
<b>Scheme2</b>	Wandoan	Bell	Dalby		Wandoan	Bell		Tara	Bell	Miles	Dalby
<b>Sample Point2</b>	Final Treated	Railway Garden	Edward St	Tower Exit	O'Sullivan	Railway Garden	Final Water	Skatepark	works Depot	Final Water	Admin Sink
<b>Water Quality Reviewed2</b>	Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	E.coli Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	Fluoride Free Chlorine Residual Turbidity pH	Conductivity Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	Free Chlorine Residual Turbidity pH	Conductivity E.coli Fluoride Free Chlorine Residual Turbidity
<b>Comments/Actions2</b>	Stable ops FCR flatline	FCR too high			FCR incorrect entry in SWIM			FCR a bit high	11/06/2021	No Operators initials. Emailed	No pH reading taken in Network
<b>Scheme3</b>	Warra	Chinchilla	Warra		Warra	Chinchilla		Wandoan	Chinchilla	Miles	Chinchilla
<b>Sample Point3</b>	Tower exit	WTRP Final Water	Water Tower	Best Park	Tank 4	Colamba Street		Final	Final Water	Morgan Place	Colamba Street
<b>Water Quality Reviewed3</b>	Conductivity E.coli Free Chlorine Residual Turbidity pH	Fluoride Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH	Conductivity Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual pH	Free Chlorine Residual Turbidity pH		Free Chlorine Residual Turbidity pH	E.coli Fluoride Free Chlorine Residual Turbidity pH	Conductivity Free Chlorine Residual Turbidity pH	E.coli Free Chlorine Residual Turbidity pH
<b>Comments/Actions3</b>	Still problems with Turb. Warra has been the subject of an incident in the previous week and has been tested and monitored heavily.	Some missing dates: email sent	1.16NTU going into Tower. Rest of Network 0.5NTU					FCR is high. No E.coli for res Dosing to lamella recommenced a week ago. Overall chlorine dose is too high. Has been reduced slightly already.	Why was no fluoride used 13/06/2021	Data is well behind	
<b>Scheme4</b>		Chinchilla	Warra		Warra	Chinchilla		Wandoan	Chinchilla	Condamine	Chinchilla
<b>Sample Point4</b>		Colamba St	Tank 4		School	Final Water		O'Sullivan Park	Mackie	Final	Hospital
<b>Water Quality Reviewed4</b>		Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH		Conductivity E.coli Free Chlorine Residual Turbidity pH	Fluoride Free Chlorine Residual Turbidity pH		E.coli Free Chlorine Residual pH	Conductivity Free Chlorine Residual Turbidity pH	Free Chlorine Residual Turbidity pH	Conductivity Fluoride Free Chlorine Residual Turbidity pH
<b>Comments/Actions4</b>		FCR was low; but was boosted on site. Fluoride back online.			A few missing E.coli records			FCR is High; spoke with Anthony B	Potentially running FCR too high		
<b>Scheme5</b>		Condamine	Jandowae			Condamine		Warra	Chinchilla	Condamine	Chinchilla
<b>Sample Point5</b>		WTP	Tower Exit			Final Water		Tank 4	Industrial	Pioneer Park	Industrial

Date	01/04/21	01/04/21	20/04/21	27/04/21	13/05/21	13/05/21	13/05/21	15/06/21	15/06/21	26/06/21	23/06/21
<b>Water Quality Reviewed5</b>		Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH			Fluoride Free Chlorine Residual Turbidity pH		Conductivity E.coli Free Chlorine Residual Turbidity pH	E.coli Free Chlorine Residual Turbidity pH	E.coli Free Chlorine Residual Turbidity pH	Fluoride Free Chlorine Residual Turbidity pH
<b>Comments/Actions5</b>		Treated water turbidity up. Emailed about E.coli	FCR being lowered gradually					2 weeks since last E.coli x res. FCR too high	Has the hypo been changed out; Emailed	No record of E.coli test this week. Miles is behind in data entry about a week. No record of e coli testing for about 2 weeks .	Fluoride Offline
<b>Scheme6</b>		<b>Condamine</b>	<b>Miles</b>			<b>Condamine</b>		<b>Warra</b>	<b>Condamine</b>		<b>Bell</b>
<b>Sample Point6</b>		Pioneer Park	LLR			Pioneer Park		Best Park	Final Water		Low Level Exit
<b>Water Quality Reviewed6</b>		Free Chlorine Residual Turbidity pH	Conductivity Fluoride Free Chlorine Residual Turbidity pH			Free Chlorine Residual Turbidity pH		Conductivity Free Chlorine Residual Turbidity pH	Free Chlorine Residual Turbidity pH		Conductivity E.coli Free Chlorine Residual Turbidity pH
<b>Comments/Actions6</b>		Email sent about E.coli				Trending low but now better			No E.coli tests online. Email sent		
<b>Scheme7</b>		<b>Dalby</b>	<b>Jandowae</b>			<b>Dalby</b>		<b>Warra</b>	<b>Condamine</b>		<b>Bell</b>
<b>Sample Point7</b>		Edward St	Lions Park			Clear water tank		Tower Exit	Pioneer Park		Railway Garden
<b>Water Quality Reviewed7</b>		Conductivity E.coli Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH			Conductivity Free Chlorine Residual Turbidity pH		Conductivity Free Chlorine Residual Turbidity pH	Free Chlorine Residual Turbidity pH		Conductivity Free Chlorine Residual Turbidity pH
<b>Comments/Actions7</b>								FCR high, email sent	No E.coli tests online. Email sent		
<b>Scheme8</b>		<b>Dalby</b>	<b>Condamine</b>			<b>Dalby</b>			<b>Dalby</b>		<b>Jandowae</b>
<b>Sample Point8</b>		WWTP				DWR			Clear Water		Apex
<b>Water Quality Reviewed8</b>		E.coli Fluoride Free Chlorine Residual Turbidity				Conductivity Free Chlorine Residual Turbidity pH			Conductivity Fluoride Free Chlorine Residual Turbidity pH		Conductivity E.coli Free Chlorine Residual Turbidity pH
<b>Comments/Actions8</b>			No up-to-date data			No Network Tests			Spadns 1ppm = 0.87		
<b>Scheme9</b>		<b>Dalby</b>	<b>Bell</b>			<b>Jandowae</b>			<b>Dalby</b>		<b>Jandowae</b>
<b>Sample Point9</b>		Admin Sink	LLR Exit			Final Water			Edward Street		Final Water
<b>Water Quality Reviewed9</b>		E.coli Free Chlorine Residual Turbidity pH	Conductivity E.coli Free Chlorine Residual Turbidity pH			Conductivity Free Chlorine Residual Turbidity pH			Conductivity Free Chlorine Residual Turbidity pH		Conductivity E.coli Free Chlorine Residual Turbidity pH
<b>Comments/Actions9</b>		Emailed Dalby WTP to confirm the turb							No E.coli		Emails from supervisor about FCR & pH
<b>Scheme10</b>		<b>Jandowae</b>	<b>Tara</b>			<b>Jandowae</b>			<b>Dalby</b>		<b>Tara</b>
<b>Sample Point10</b>		WTP Final	Water Tower Exit			Hospital			Kookaburra Street		Test Point 8

Date	01/04/21	01/04/21	20/04/21	27/04/21	13/05/21	13/05/21	13/05/21	15/06/21	15/06/21	26/06/21	23/06/21
<b>Water Quality Reviewed10</b>		Conductivity E.coli Free Chlorine Residual Turbidity pH	Conductivity Free Chlorine Residual Turbidity pH			Conductivity Free Chlorine Residual Turbidity pH			Conductivity E.coli Free Chlorine Residual Turbidity		Conductivity E.coli Free Chlorine Residual Turbidity pH
<b>Comments/Actions10</b>		Filter run have been too long									
<b>Scheme11</b>		<b>Jandowae</b>	<b>Tara</b>			<b>Miles</b>			<b>Jandowae</b>		<b>Tara</b>
<b>Sample Point11</b>		Tower Exit	Res			Final Water			Final		Showgrounds
<b>Water Quality Reviewed11</b>		E.coli Free Chlorine Residual Turbidity pH	Conductivity Free Chlorine Residual Turbidity pH			Free Chlorine Residual Turbidity pH			Conductivity E.coli Free Chlorine Residual Turbidity pH		Conductivity Free Chlorine Residual Turbidity pH
<b>Comments/Actions11</b>		Some results missing							Hypo dosed has been reduced. Email Sent		
<b>Scheme12</b>		<b>Miles</b>	<b>Chinchilla</b>			<b>Miles</b>			<b>Jandowae</b>		<b>Wandoan</b>
<b>Sample Point12</b>		Final water	Mackie			LLR			Apex Park		Final Treated
<b>Water Quality Reviewed12</b>		Fluoride Free Chlorine Residual Turbidity pH	Conductivity Fluoride Free Chlorine Residual Turbidity pH			Conductivity Free Chlorine Residual Turbidity pH			Conductivity E.coli Free Chlorine Residual Turbidity pH		Free Chlorine Residual Turbidity pH
<b>Comments/Actions12</b>		FCR very high. Can't see E.coli test				Network Tests more than a week behind					
<b>Scheme13</b>		<b>Miles</b>	<b>Chinchilla</b>			<b>Tara</b>			<b>Miles</b>		<b>Wandoan</b>
<b>Sample Point13</b>		Anzac	AL WTP			Test Point 8			LLR		O'Sullivan Park
<b>Water Quality Reviewed13</b>		Fluoride Free Chlorine Residual Turbidity pH	Free Chlorine Residual Turbidity pH			Conductivity E.coli Free Chlorine Residual Turbidity pH			Conductivity Fluoride Free Chlorine Residual Turbidity pH		E.coli Free Chlorine Residual Turbidity pH
<b>Comments/Actions13</b>		FCR high. Records a week behind.									
<b>Scheme14</b>		<b>Tara</b>	<b>Miles</b>						<b>Miles</b>		<b>Warra</b>
<b>Sample Point14</b>		Tower exit	Final Water						Anzac Park		Final Water
<b>Water Quality Reviewed14</b>		Conductivity E.coli Free Chlorine Residual Turbidity pH	Free Chlorine Residual Turbidity pH						Conductivity Fluoride Free Chlorine Residual Turbidity pH		Conductivity Free Chlorine Residual Turbidity pH
<b>Comments/Actions14</b>											CL2 Pump turned down

Table 5 – Risk management improvement program implementation status

Town	Improvement Action No.	Scheme Component	Hazard / Hazardous Event	Priority	Actions	Revised Target Date	Original Target Date	Estimated Cost	Improvement Action Reference	Responsibility	Status	Comments
Bell	BIA 12	Chemical dosing	Inadequate or incorrect dosing causes inadequate disinfection and or plant performance.	High	Install dosing monitor, duty standby pumps etc. and linked to future SCADA system	2021	2016	\$50,000		Water Treatment Principal	Partially completed. SCADA installed	With no raw water for several years work was postponed. Settled water turb monitor has been installed as an implied monitoring of coagulant dosing. Hypo dosing has been reworked.
Bell	BIA 14	Residuals	Poor quality supernatant returned to the head of the plant causing poor performance	High	Based upon regular monitoring of residuals, install flow meter on residuals return	2021	2016	\$10,000		Water Treatment Principal	Project dropped. No supernatant being returned	Supernatant is not returned.
Bell	BIA 4	Rapid mix	Coagulants not mixed correctly	High	Undertake further study on mixing performance	2019	2014	\$5,000		Water Treatment Principal	Project not currently required. Alternative options implemented. Completed	With plant out of service for long periods due to drought work was put off. Flow rate was reduced, and coagulants changed so that mixing time available was sufficient. A temporary rapid mixer has been added as an experiment permit future testing of alternative coagulants if necessary
Bell	BIA15	WTP	Clarifier and Reservoir rust repair.	High	Roof repair on reservoir. External Painting and rust removal.	2021/22		\$125,000		Water Treatment Coordinator - East	Budget has been allotted; tender will go out in 2021/2022	
Condamine	COIA12	Residuals	Poor quality residuals returned to plant which negatively impacts on process	High	Significant chance of negative impact. Installation of supernatant flow meter. . Return of supernatant not routinely practiced	2021	2016	\$20,000		Supervisor	System completed but not yet commissioned	System completed but not yet fully commissioned. Supernatant not re-used until commissioned.
Condamine	COIA9	Chemical dosing	Incorrect dosing	Medium	Adequate system current exists but could be improved. Install dosing monitoring system Project to be considered as part of future SCADA up grade	2022	2020	\$50,000		Water Treatment Principal	Chlorine and turbidity monitoring installed. Chlorine monitor operating yet to be fully integrated to SCADA.	Settled water turbidity monitor installed. Chlorine monitor installed with commissioning in 2022. Plant has higher level of operator attendance than in the past.
Condamine	COIA4	Filtration	Turbidity carryover into treated water following backwash	High	No filter to waste capability. Investigate filter return to service performance	Completed	2013	\$20,000		Supervisor	Completed	Unable to install filter to waste capability currently. Backwash procedure totally redeveloped to improve backwash performance. A 20-minute filter settle period is allowed after backwash which "ripens" the filter to some extent.
Condamine	COIA5	Filtration	Turbidity carryover into treated water following backwash	High	No filter to waste capability. Install filter to waste facility Not currently practical to install filter to waste capability. Needs to be a part of a total review of operations.	Completed	2019			Water Treatment Principal	Completed	Unable to install filter to waste capability currently. Backwash procedure totally redeveloped to improve backwash performance. A 20-minute filter settle period is allowed after backwash which "ripens" the filter to some extent.
Condamine	COIA7	Disinfection	Inadequate disinfection	High	Total failure likely . Install dosing monitoring system Project to be considered as part of future SCADA up grade	2020-	2019	\$30,000		Water Treatment Principal	System installed to be commissioned in 2022	Online monitor to be installed as part of SCADA upgrade.

Town	Improvement Action No.	Scheme Component	Hazard / Hazardous Event	Priority	Actions	Revised Target Date	Original Target Date	Estimated Cost	Improvement Action Reference	Responsibility	Status	Comments
Condamine	COIA13	Alarms	Treatment process failure is undetected, and plant produces unsafe water	High	No current system. Upgrade the current alarm system to a proper SCADA system. System proposed but deferred to 2019	Completed	2014	\$50,000		Utilities Senior Technical Officer	underway	SCADA install scheduled for completion by end of 2020
Condamine		Coagulation /Flocculation	High levels of organic carbon in raw water carry over in the treated water and increasing the risk of DBPs when chlorinated	High	Trial operation in enhanced coagulation mode	New item	2021 Trials only	\$10,000		Water Treatment Principal	Works being undertaken in 2021/22 as part of DBP control strategy	
Condamine		Disinfection	High levels of organic carbon in raw water carry over in the treated water and increasing the risk of DBPs when chlorinated	High	Small reservoirs to be re-arranged to utilise one as a dedicated chlorine contact tank thereby improving the control of dosing and early detection of excessive or inadequate dosing.	New item	2022	\$30,000		Supervisor	Works being undertaken in 2021/22 as part of DBP control strategy	Chlorine monitor installed but to be commissioned in 2022.
Dalby	DI 7	Filtration	Turbidity carry over after backwash due to an unusual filter to waste process	High	Monitor filter water turbidity as filters return to service.	Ongoing	Ongoing	Operational Expense		Operator	Ongoing	
Dalby	DI 10	Alarms	Process problems during attended or unattended operation that cause the plant to produce unsafe water	High	Compile a list of all current alarms and undertake a function test. Repair if necessary.	2022		\$10,000		Supervisor	Partially Complete	Work is proposed as part of electrical and control upgrade Stage 2
Dalby	DI 11	Alarms	Process problems during attended or unattended operation that cause the plant to produce unsafe water	High	Undertake an alarm risk assessment based on whole of plant scenario.	2022		Operational Expense		Water Treatment Principal	Partially Complete	Work is proposed as part of electrical and control upgrade Stage 2
Dalby	DI 12	Alarms	Process problems during attended or unattended operation that cause the plant to produce unsafe water	High	Implement alarm system changes based on risk assessment.	2022	2015	\$50,000		Water Treatment Principal	Partially Complete	Work is proposed as part of electrical and control upgrade Stage 2
Dalby	DI 9	Disinfection	Disinfection system failure goes undetected	High	Install dosing system monitors on all dose pumps not already so equipped.	2022	2014	\$100,000		Water Treatment Principal	Partially Complete	Work is proposed as part of electrical and control upgrade Stage 2
Dalby	DI 13	Filtration	Sand filters on surface plant - inspection of multiple cells - possible media replacement.	High	Inspect cells for possible media replacement	2021/22		\$10 000		Water Treatment Principal	To be completed during winter months when demand is lower	
Jandowae	JIA 8	Filtration	Turbidity carryover into treated water after backwashing	High	Install filter to waste capability and filtered water turbidity monitors- Whole new filtration system installed	Complete	Complete	\$100,000	DWQMP	Water Treatment Principal	Complete	Filtered water turbidity is monitored manually every day.
Jandowae	JIA 11	Chemical dosing	Inadequate monitoring of chemicals causes over or under dosing of chemicals	High	Install online chemical monitoring , tank levels, dose pump flow rate etc	Complete	Complete	\$100,000	DWQMP	Water Treatment Principal	Project partially completed. Remainder of project dependent upon installation of a plant PLC in future upgrade.	Tanks and dose pumps were replaced so that batching of chemicals not required. Pumps have capability to be monitored. No in plant PLC available . PLC to be installed in future plant wide upgrade. Early design work undertaken now for upgrades in 2021/22/23

Town	Improvement Action No.	Scheme Component	Hazard / Hazardous Event	Priority	Actions	Revised Target Date	Original Target Date	Estimated Cost	Improvement Action Reference	Responsibility	Status	Comments
Jandowae	JIA 3	Rapid mix and Flocculation	Coagulants not adequately mixed. This prevents the use of some coagulants including alum. Enhanced coagulation not possible. Poorer levels of DBP precursor removal than expected	High	Install new rapid mix and flocculation system- Will allow enhanced coagulation as an option when conditions are suitable.	Interim solution in place. Advanced solution scheduled for upgrades 2021/22/23	2016	\$100000. Upgrade of flocculation system only	DWQMP	Water Treatment Principal	Interim solution in place. New flocculator in design. Work to be included in upgrades in 2021/22/23	Minor improvements implemented and changes to coagulant in use have improved plant performance. This project is being undertaken as part of an upgrade at the front of the treatment including improved access walkways and steps
Jandowae	JIA 14	Disinfection	Disinfection-Incorrect chlorine dosing including low or high or no dosing	High	Modification of valving and pipework to allow the small reservoir to be operated as a Clear Water Chlorine Contact tank in series with the Larger Storage reservoir	New item	2023	\$50,000	DWQMP	Water Treatment Principal	Early concept design work	Work is being undertaken as a part of several upgrades across 2021/22/23
Jandowae	JIA 15	Disinfection	Dissolved organic carbon in raw water that is unable to be removed by the conventional process forming DBPs	High	Install an air stripper in the Clear Water Contact Tank to remove chloroform	New item	2023	\$30,000	DWQMP	Water Treatment Principal	Early concept design work	Work is being undertaken as a part of several upgrades across 2021/22/24
Jandowae	JIA 16	Disinfection	High levels of Dissolved organic carbon in water being chlorinated because of failure to control by other means-Formation of DBPs above guideline values	Medium	Install chloramine dosing system	New item	2024	\$100,000	DWQMP	Water Treatment Principal	Ammonia tank and some dosing equipment installed during earlier upgrades. Further work will be done as required.	Project will be dependent upon the success of precursor removal.
Miles	MIA 13	RO Ponds	Recommendations from Annual RO Ponds Inspection Report			Ongoing				Water Treatment Principal	Ongoing	
Miles	MIA 12	Bore	Loss of bore when desal plant is required as only supply source due water quality issues in Gil Weir.	High	Significant chance of negative impact. Another bore to be installed to improve the reliability of the system	Deferred indefinitely	2013	\$1.2 million		Utilities Manager	Deferred indefinitely	Council has elected to defer this project indefinitely.
Miles	MIA 13	RO Ponds	Recommendations from Annual RO Ponds Inspection Report			Ongoing				Water Treatment Principal	Ongoing	
Tara		RO Ponds	Recommendations from Annual RO Ponds Inspection Report			Ongoing				Water Treatment Principal	Ongoing	
Tara	TIA 1	WTP	<u>Incorrect chemical use</u>	-	<u>Improve labelling and signage of the chemical tanks</u>	-	<u>2020</u>	<u>\$5,000</u>	<u>DWQMP</u>	<u>Utilities Coordinators</u>	-	-
Tara	TIA 2	WTP	<u>No chemical dosing due to malfunction or lack of chemicals</u>	-	<u>When pumps are replaced considering integrating pumps into control system so that feedback is provided to control system.</u>	-	<u>2021</u>	<u>\$40,000</u>	<u>DWQMP</u>	<u>Utilities Coordinators</u>	-	-
Tara	TIA 3	WTP	<u>Poor operation of plant or excessive return of supernatant causes high treated water turbidity</u>	-	<u>Install settled water turbidity monitor</u>	-	<u>2022</u>	<u>\$20,000</u>	<u>DWQMP</u>	<u>Utilities Coordinators</u>	-	-
Tara	TIA 4	Bore	Bore 2 to be dipped and tested whilst operating. Bore may need maintenance or pump deepening - inadequate flow bore to be sealed.	High	Dip and Test bore while in operation to ascertain need for maintenance and or pump deepening		2021/22	Ongoing		Water Treatment Principal	Ongoing	

Town	Improvement Action No.	Scheme Component	Hazard / Hazardous Event	Priority	Actions	Revised Target Date	Original Target Date	Estimated Cost	Improvement Action Reference	Responsibility	Status	Comments
Warra	WIA 28	Disinfection	Regular detections and exceedance of DBPs	High	Chloramine dosing is proposed as a trial solution. Chloramine system to be installed	System installed but not currently in use.	Jun-18			Water Treatment Principal	Project put-on long-term hold whilst other DBP options are implemented	
Warra	WIA 29	Raw water supply	Algae growth in off stream storage linked to the formation of Bromoforms in treated water.	High	Monthly sampling and algae counting, to drive early intervention dosing	new item	2021	Ongoing operational expense		Supervisor	Ongoing	
Warra	WIA 30	Raw water supply	Algae growth in off stream storage linked to the formation of Bromoforms in treated water.	Medium	Regular dosing of chelated copper into the storage to reduce/eliminate algae growth. Dosing rig to be installed at off stream storage pumpstation	New item	by 2022	\$10,000		Water Treatment Principal	Project superseded by a larger algae control solution involving the installation of aeration and mixing in the Warra Dam	New project likely to be in place by the end of 2021.
Warra	WIA 31	Disinfection	THM have continued to be high and THM control to be implemented	Urgent	Surface water aerators to be installed in Warra Dam.	2020/21 2021/22		\$60,000		Water Treatment Principal	Aerators in our possession; dam site currently too wet for installation	A DBP Strategy will be implemented in 2021/22/

## 4 Verification Monitoring - Water Quality Information and Summary

The section identifies the water quality characteristics sampled under WDRC's Verification Monitoring Program during 2020-2021.

The information is categorized into:

- Water quality parameter.
- Schemes sampling for the specific parameter.
- Number of samples required under WDRC's Verification Monitoring Program
- Number of samples collected and Tested by External and Internal Labs

Incident numbers applicable to the specific parameter and scheme. Only incident numbers will be included in the comments; further detail relating to incidents, if applicable, will be provided in Section 6 - Incidents Reported to the Regulator.

### 4.1 Disinfection By-Products

Table 6 - Disinfection By-Products

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
Bell	Chloroform		1 R/1 MONTH	8		
	Bromide-chloromethane					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Dibromo-chloromethane					
	Bromoform					
	Total Trihalomethanes	.25				
	Monochloro-acetic Acid	.15				
	Monobromo-acetic Acid					
	Dichloro-acetic Acid	.1				
	Trichloro-acetic Acid	.1				
	Bromochloro-acetic Acid					
	Bromodichloro-acetic Acid					
	Dibrom-acetic Acid					
	Chlorodibromo-acetic Acid					
	Dalapon 2,2-DPA	.5				
	Chlorite	0.8				
	Chlorate	0.8				
<b>Chinchilla</b>	Chloroform		1 R/1 MONTH	10		

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Bromide-chloromethane					
	Dibromo-chloromethane					
	Bromoform					
	Total Trihalomethanes	.25				
	Monochloro-acetic Acid	.15				
	Monobromo-acetic Acid					
	Dichloro-acetic Acid	.1				
	Trichloro-acetic Acid	.1				
	Bromochloro-acetic Acid					
	Bromodichloro-acetic Acid					
	Dibrom-acetic Acid					
	Chlorodibromo-acetic Acid					
	Dalapon 2,2-DPA	.5				
	Chlorite	0.8				
	Chlorate	0.8				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
<b>Condamine</b>  <i>Condamine recorded several DBP incidents over the annual year; the Total Trihalomethanes were elevated due to Chloroform predominance making up 60% of Total THM's. Air stripping and rearrangement of the reservoirs were performed to alleviate the precursor. The small reservoirs were re-arranged to utilise one as a dedicated chlorine contact tank thereby improving the</i>	Chloroform		1 R/1 MONTH	35		
	Bromide-chloromethane					
	Dibromo-chloromethane					
	Bromoform					
	Total Trihalomethanes	.25				DWI-480-20-08649 DWI-480-20-08653
	Monochloro-acetic Acid	.15				
	Monobromo-acetic Acid					
	Dichloro-acetic Acid	.1				DWI-480-20-08653
	Trichloro-acetic Acid	.1				
	Bromochloro-acetic Acid					
	Bromodichloro-acetic Acid					
	Dibrom-acetic Acid					
Chlorodibromo-acetic Acid						
Dalapon 2,2-DPA	.5					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
control of dosing and early detection of excessive or inadequate dosing. A DBP Strategy will be implemented in 2021/22	Chlorite	0.8				
	Chlorate	0.8				
Dalby	Chloroform		1 R/1 MONTH	12		
	Bromide-chloromethane					
	Dibromo-chloromethane					
	Bromoform					
	Total Trihalomethanes	.25				
	Monochloro-acetic Acid	.15				
	Monobromo-acetic Acid					
	Dichloro-acetic Acid	.1				
	Trichloro-acetic Acid	.1				
	Bromochloro-acetic Acid					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Bromodichloro-acetic Acid					
	Dibrom-acetic Acid					
	Chlorodibromo-acetic Acid					
	Dalapon 2,2-DPA	.5				
	Chlorite	0.8				
	Chlorate	0.8				
Jandowae	Chloroform		1 R/1 MONTH	8		
	Bromide-chloromethane					
	Dibromo-chloromethane					
	Bromoform					
	Total Trihalomethanes	.25				
	Monochloro-acetic Acid	.15				
	Monobromo-acetic Acid					
	Dichloro-acetic Acid	.1				
	Trichloro-acetic Acid	.1				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Bromochloro-acetic Acid					
	Bromodichloro-acetic Acid					
	Dibrom-acetic Acid					
	Chlorodibromo-acetic Acid					
	Dalapon 2,2-DPA	.5				
	Chlorite	0.8				
	Chlorate	0.8				
<b>Miles</b>	Chloroform		1 R/1 MONTH	12		
	Bromide-chloromethane					
	Dibromo-chloromethane					
	Bromoform					
	Total Trihalomethanes	.25				
	Monochloro-acetic Acid	.15				
	Monobromo-acetic Acid					
	Dichloro-acetic Acid	.1				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Trichloro-acetic Acid	.1				
	Bromochloro-acetic Acid					
	Bromodichloro-acetic Acid					
	Dibrom-acetic Acid					
	Chlorodibromo-acetic Acid					
	Dalapon 2,2-DPA	.5				
	Chlorite	0.8				
	Chlorate	0.8				
<b>Tara</b>	Chloroform		1 R/1 MONTH	9		
	Bromide-chloromethane					
	Dibromo-chloromethane					
	Bromoform					
	Total Trihalomethanes	.25				
	Monochloro-acetic Acid	.15				
	Monobromo-acetic Acid					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Dichloro-acetic Acid	.1				
	Trichloro-acetic Acid	.1				
	Bromochloro-acetic Acid					
	Bromodichloro-acetic Acid					
	Dibrom-acetic Acid					
	Chlorodibromo-acetic Acid					
	Dalapon 2,2-DPA	.5				
	Chlorite	0.8				
	Chlorate	0.8				DWI-480-21-08954
<b>Wandoan</b>	Chloroform		1 R/1 MONTH	9		
	Bromide-chloromethane					
	Dibromo-chloromethane					
	Bromoform					
	Total Trihalomethanes	.25				
	Monochloro-acetic Acid	.15				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Monobromo-acetic Acid					
	Dichloro-acetic Acid	.1				
	Trichloro-acetic Acid	.1				
	Bromochloro-acetic Acid					
	Bromodichloro-acetic Acid					
	Dibrom-acetic Acid					
	Chlorodibromo-acetic Acid					
	Dalapon 2,2-DPA	.5				
	Chlorite	0.8				
	Chlorate	0.8				
<b>Warra</b> <i>Warra has recorded several DBP incidents over the annual year; total THM's have been elevated due to Bromines. Algae</i>	Chloroform		1 R/1 MONTH	26		
	Bromide-chloromethane					
	Dibromo-chloromethane					
	Bromoform					
	Total Trihalomethanes	.25				
						DWI-480-20-08651

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
<p><i>has been implicated in the concentration of Bromines. Surface water aerators are to be installed at the Warra Dam with the majority of works to be performed in 2021/2022. A DBP Strategy will be implemented in 2021/22</i></p>						DWI-480-20-08652
	Monochloro-acetic Acid	.15				
	Monobromo-acetic Acid					
	Dichloro-acetic Acid	.1				DWI-480-20-08652
	Trichloro-acetic Acid	.1				
	Bromochloro-acetic Acid					
	Bromodichloro-acetic Acid					
	Dibrom-acetic Acid					
	Chlorodibromo-acetic Acid					
	Dalapon 2,2-DPA	.5				
	Chlorite	0.8				
	Chlorate	0.8				

## 4.2 Fluoride

Table 7- Fluoride

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments *Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator
Chinchilla	Treated Spadns	1.5	3 WTP/MONTH 3 R./MONTH	85	364	
Dalby				74	363	
Miles				77	365	

## 4.3 Pesticides

Table 8 - Pesticides

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments *Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator
Bell	Ametryn	Heath 0.07	1 WTP/12 MONTH	9		Count includes pesticide sampling of raw surface water
	Atrazine	Heath 0.02				
	Bromacil	Health 0.4				
	Desethyl Atrazine					
	Desisopropyl Atrazine					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Diuron	Health 0.02				
	Fluometuron	Health 0.07				
	Hexazione Hexazinone	Health 0.4				
	Imidacloprid					
	Metolachlor	Health 0.3				
	Prometryn)					
	Simazine	Health 0.02				
	Tebuthiuron					
	Terbutryn	Health 0.4				
	DEET					
	Terbutylazine	Health 0.01				
	Triethyl Phosphate (No HV)					
	Tris(Chloropropyl) Phosphate Isomers					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	N-Butylbenzenesulfonamide					
	2,4-Di-t-butylphenol	Health 0.1				
	Acetone					
	Chloroform					
	Dimethoate	Heath 0.007				
	2,4-D	Heath 0.03				
	Atrazine, 2-hydroxy					
	Fluroxypyr					
	Imazethapyr					
	Isoxaflutole Metabolite (DKN)					
	Metolachlor-OXA					
	Tebuconazole					
	Dieldrin (0.3)					
Chinchilla	Ametryn	Heath 0.07	1 WTP/12 MONTH	5		

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Atrazine	Heath 0.02	1 R/3 MONTH			
	Bromacil	Health 0.4				
	Desethyl Atrazine					
	Desisopropyl Atrazine					
	Diuron	Health 0.02				
	Fluometuron	Heath 0.07				
	Hexazione Hexazinone	Health 0.4				
	Imidacloprid					
	Metolachlor	Health 0.3				
	Prometryn)					
	Simazine	Heath 0.02				
	Tebuthiuron					
	Terbutryn	Heath 0.4				
	DEET					
	Terbutylazine	Heath 0.01				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Triethyl Phosphate (No HV)					
	Tris(Chloropropyl) Phosphate Isomers					
	N-Butylbenzenesulfonamide					
	2,4-Di-t-butylphenol	Health 0.1				
	Acetone					
	Chloroform					
	Dimethoate	Health 0.007				
	2,4-D	Health 0.03				
	Atrazine, 2-hydroxy					
	Fluroxypyr					
	Imazethapyr					
	Isoxaflutole Metabolite (DKN)					
	Metolachlor-OXA					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Tebuconazole					
	Dieldrin (0.3)					
Condamine	Ametryn	Heath 0.07	1 WTP/12 MONTH	5		
	Atrazine	Heath 0.02	1 R/3 MONTH			
	Bromacil	Health 0.4				
	Desethyl Atrazine					
	Desisopropyl Atrazine					
	Diuron	Health 0.02				
	Fluometuron	Heath 0.07				
	Hexazione Hexazinone	Health 0.4				
	Imidacloprid					
	Metolachlor	Health 0.3				
	Prometryn)					
	Simazine	Heath 0.02				

Scheme	Parameter	Water Quality Criteria <i>(mg/L unless otherwise specified)</i> <i>(ADWG guideline value)</i>	No. of Samples Required to be Collected <i>(as per the DWQMP)</i>	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments  <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Tebuthiuron					
	Terbutryn	Heath 0.4				
	DEET					
	Terbutylazine	Heath 0.01				
	Triethyl Phosphate (No HV)					
	Tris(Chloropropyl) Phosphate Isomers					
	N-Butylbenzenesulfonamide					
	2,4-Di-t-butylphenol	Health 0.1				
	Acetone					
	Chloroform					
	Dimethoate	Heath 0.007				
	2,4-D	Heath 0.03				
	Atrazine, 2-hydroxy					
	Fluroxypyr					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Imazethapyr					
	Isoxaflutole Metabolite (DKN)					
	Metolachlor-OXA					
	Tebuconazole					
	Dieldrin (0.3)					
Dalby	Ametryn	Heath 0.07	1 WTP/12 MONTH	4		
	Atrazine	Heath 0.02	1 R/3 MONTH			
	Bromacil	Health 0.4				
	Desethyl Atrazine					
	Desisopropyl Atrazine					
	Diuron	Health 0.02				
	Fluometuron	Heath 0.07				
	Hexazione Hexazinone	Health 0.4				
	Imidacloprid					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Metolachlor	Health 0.3				
	Prometryn)					
	Simazine	Heath 0.02				
	Tebuthiuron					
	Terbutryn	Heath 0.4				
	DEET					
	Terbutylazine	Heath 0.01				
	Triethyl Phosphate (No HV)					
	Tris(Chloropropyl) Phosphate Isomers					
	N-Butylbenzenesulfonamide					
	2,4-Di-t-butylphenol	Health 0.1				
	Acetone					
	Chloroform					
	Dimethoate	Heath 0.007				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	2,4-D	Heath 0.03				
	Atrazine, 2-hydroxy					
	Fluroxypyr					
	Imazethapyr					
	Isoxaflutole Metabolite (DKN)					
	Metolachlor-OXA					
	Tebuconazole					
	Dieldrin (0.3)					
Jandowae	Ametryn		1 WTP/12 MONTH	4		
	Atrazine	Heath 0.02	1 R/3 MONTH			
	Bromacil	Health 0.4				
	Desethyl Atrazine					
	Desisopropyl Atrazine					
	Diuron	Health 0.02				
	Fluometuron	Heath 0.07				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) <i>(ADWG guideline value)</i>	No. of Samples Required to be Collected <i>(as per the DWQMP)</i>	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Hexazine	Health 0.4				
	Hexazinone					
	Imidacloprid					
	Metolachlor	Health 0.3				
	Prometryn)					
	Simazine	Heath 0.02				
	Tebuthiuron					
	Terbutryn	Heath 0.4				
	DEET					
	Terbutylazine	Heath 0.01				
	Triethyl Phosphate (No HV)					
	Tris(Chloropropyl) Phosphate Isomers					
	N-Butylbenzenesulfonamide					
	2,4-Di-t-butylphenol	Health 0.1				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Acetone					
	Chloroform					
	Dimethoate	Heath 0.007				
	2,4-D	Heath 0.03				
	Atrazine, 2-hydroxy					
	Fluroxypyr					
	Imazethapyr					
	Isoxaflutole Metabolite (DKN)					
	Metolachlor-OXA					
	Tebuconazole					
	Dieldrin (0.3)					
Miles	Ametryn	Heath 0.07	1 WTP/12 MONTH	6		
	Atrazine	Heath 0.02	1 R/3 MONTH			
	Bromacil	Health 0.4				
	Desethyl Atrazine					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Desisopropyl Atrazine					
	Diuron	Health 0.02				
	Fluometuron	Health 0.07				
	Hexazine Hexazinone	Health 0.4				
	Imidacloprid					
	Metolachlor	Health 0.3				
	Prometryn)					
	Simazine	Health 0.02				
	Tebuthiuron					
	Terbutryn	Health 0.4				
	DEET					
	Terbutylazine	Health 0.01				
	Triethyl Phosphate (No HV)					
	Tris(Chloropropyl) Phosphate Isomers					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	N-Butylbenzenesulfonamide					
	2,4-Di-t-butylphenol	Health 0.1				
	Acetone					
	Chloroform					
	Dimethoate	Heath 0.007				
	2,4-D	Heath 0.03				
	Atrazine, 2-hydroxy					
	Fluroxypyr					
	Imazethapyr					
	Isoxaflutole Metabolite (DKN)					
	Metolachlor-OXA					
	Tebuconazole					
	Dieldrin (0.3)					
Warra	Ametryn	Heath 0.07	1 WTP/12 MONTH	5		

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Atrazine	Heath 0.02	1 R/3 MONTH			
	Bromacil	Health 0.4				
	Desethyl Atrazine					
	Desisopropyl Atrazine					
	Diuron	Health 0.02				
	Fluometuron	Heath 0.07				
	Hexazione Hexazinone	Health 0.4				
	Imidacloprid					
	Metolachlor	Health 0.3				
	Prometryn)					
	Simazine	Heath 0.02				
	Tebuthiuron					
	Terbutryn	Heath 0.4				
	DEET					
	Terbutylazine	Heath 0.01				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) <i>(ADWG guideline value)</i>	No. of Samples Required to be Collected <i>(as per the DWQMP)</i>	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Triethyl Phosphate (No HV)					
	Tris(Chloropropyl) Phosphate Isomers					
	N-Butylbenzenesulfonamide					
	2,4-Di-t-butylphenol	Health 0.1				
	Acetone					
	Chloroform					
	Dimethoate	Health 0.007				
	2,4-D	Health 0.03				
	Atrazine, 2-hydroxy					
	Fluroxypyr					
	Imazethapyr					
	Isoxaflutole Metabolite (DKN)					
	Metolachlor-OXA					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Tebuconazole					
	Dieldrin (0.3)					

## 4.4 Microbiology

Table 9 - Microbiology

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
Bell	E.coli	0	1 WTP/MONTH	50	282	
	Coliforms	0	1 R/MONTH			
Chinchilla	E.coli	0	1 WTP/MONTH	107	304	
	Coliforms	0	6 R/MONTH			
Condamine	E.coli	0	1 WTP/MONTH	46	147	
	Coliforms	0	2 R/MONTH			
Dalby	E.coli	0	1 WTP/MONTH	118	262	
	Coliforms	0	7 R/MONTH			

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
Jandowae	E.coli	0	1 WTP/MONTH	90	258	
	Coliforms	0	5 R/MONTH			
Miles	E.coli	0	1 WTP/MONTH	91	156	
	Coliforms	0	5 R/MONTH			
Tara	E.coli	0	1 WTP/MONTH	46	55	
	Coliforms	0	5 R/MONTH			
Wandoan	E.coli	0	1 WTP/MONTH	25	142	
	Coliforms	0	2 R/MONTH			
Warra	E.coli	0	1 WTP/MONTH	42	277	DWI-480-21-08907
	Coliforms	0	1 R/MONTH			

## 4.5 Standard Chemical Analysis

Table 10 - Standard Chemical Analysis

Scheme	Parameter	Water Quality Criteria <i>(mg/L unless otherwise specified)</i> <i>(ADWG guideline value)</i>	No. of Samples Required to be Collected <i>(as per the DWQMP)</i>	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
Bell	Alkalinity		1 R/2 MONTH	R 7		
	Aluminium (Al)	Aesthetic 0.2	1 SW/2 MONTH	SW 12		
	Bicarbonate (HCO <sup>3</sup> )					
	Boron (B)	Heath 4				
	Calcium (Ca)					
	Carbonate (CO <sup>3</sup> )					
	Chloride (Cl)	Aesthetic 250				
	Conductivity				R - 582	
	Copper (Cu)	Aesthetic 1 Heath 2				
	Figure of Merit Ratio					
	Fluoride (F)	Heath 1.5				
	Hydrogen (H)					
	Hydroxide (OH)					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Iron (Fe)	Aesthetic 0.3				
	Magnesium (mg)					
	Manganese (Mn)	Aesthetic 01 Heath 0.5				
	Mole Ratio					
	Nitrate (NO <sup>3</sup> )	Aesthetic 50				
	pH	Aesthetic 6.5 - 8.5pH			R - 591	
	pH Sat					
	Potassium (K)					
	Residual Alkalinity	Aesthetic 150				
	Saturation Index					
	Silica	Aesthetic 80				
	Sodium (Na)	Aesthetic 180 Heath 180 ug/L				
	Sodium Absorption Ratio					
	Sulphate (SO <sub>4</sub> )	Aesthetic 250				
	Temporary Hardness					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Total Dissolved Ions					
	Total Dissolved Solids	Heath 500 µg/L Aesthetic 600 µg/L				
	Total Hardness	Aesthetic				
	True Colour	Aesthetic 15 HU				
	Turbidity	Aesthetic 5 NTU <1 NTU is the target for effective disinfection <0.2 NTU is the target for effective filtration of Cryptosporidium & Gardai				
	Zinc (Zn)	Aesthetic 3				
Chinchilla	Alkalinity		1 R/MONTH	R 19 SW 10 WTP 5		
	Aluminium (Al)	Aesthetic 0.2				
	Bicarbonate (HCO <sup>3</sup> )					
	Boron (B)	Heath 4				
	Calcium (Ca)					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Carbonate (CO <sup>3</sup> )					
	Chloride (Cl)	Aesthetic 250				
	Conductivity				R - 215	
	Copper (Cu)	Aesthetic 1 Heath 2				
	Figure of Merit Ratio					
	Fluoride (F)	Heath 1.5				
	Hydrogen (H)					
	Hydroxide (OH)					
	Iron (Fe)	Aesthetic 0.3				
	Magnesium (mg)					
	Manganese (Mn)	Aesthetic 01 Heath 0.5				
	Mole Ratio					
	Nitrate (NO <sup>3</sup> )	Aesthetic 50				
	pH	Aesthetic 6.5 - 8.5pH			R - 839	
	pH Sat					
	Potassium (K)					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Residual Alkalinity	Aesthetic 150				
	Saturation Index					
	Silica	Aesthetic 80				
	Sodium (Na)	Aesthetic 180 Heath 180 ug/L				
	Sodium Absorpt. Ratio					
	Sulphate (SO4)	Aesthetic 250				
	Temporary Hardness					
	Total Dissolved Ions					
	Total Dissolved Solids	Heath 500 µg/L Aesthetic 600 µg/L				
	Total Hardness 200	Aesthetic				
	True Colour 15	Aesthetic 15 HU				
	Turbidity	Aesthetic 5 NTU <1 NTU is the target for effective disinfection <0.2 NTU is the target for effective filtration of			R - 822	

Scheme	Parameter	Water Quality Criteria <i>(mg/L unless otherwise specified)</i> <i>(ADWG guideline value)</i>	No. of Samples Required to be Collected <i>(as per the DWQMP)</i>	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments  <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
		Cryptosporidium & Gardai				
	Zinc (Zn)	Aesthetic 3				
Condamine	Alkalinity		1 R/MONTH	R - 14		
	Aluminium (Al)	Aesthetic 0.2	1 SW//MONTH	SW - 11		
	Bicarbonate (HCO <sup>3</sup> )					
	Boron (B)	Heath 4				
	Calcium (Ca)					
	Carbonate (CO <sup>3</sup> )					
	Chloride (Cl)	Aesthetic 250				
	Conductivity				R - 10	
	Copper (Cu)	Aesthetic 1 Heath 2				
	Figure of Merit Ratio					
	Fluoride (F)	Heath 1.5				
	Hydrogen (H)					
	Hydroxide (OH)					
	Iron (Fe)	Aesthetic 0.3				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Magnesium (mg)					
	Manganese (Mn)	Aesthetic 01 Heath 0.5				
	Mole Ratio					
	Nitrate (NO <sup>3</sup> )	Aesthetic 50				
	pH	Aesthetic 6.5 - 8.5pH			R - 124	
	pH Sat					
	Potassium (K)					
	Residual Alkalinity	Aesthetic 150				
	Saturation Index					
	Silica	Aesthetic 80				
	Sodium (Na)	Aesthetic 180 Heath 180 ug/L				
	Sodium Absorpt. Ratio					
	Sulphate (SO <sub>4</sub> )	Aesthetic 250				
	Temporary Hardness					
	Total Dissolved Ions					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Total Dissolved Solids	Heath 500 µg/L Aesthetic 600 µg/L				
	Total Hardness 200	Aesthetic				
	True Colour 15	Aesthetic 15 HU				
	Turbidity	Aesthetic 5 NTU  <1 NTU is the target for effective disinfection  <0.2 NTU is the target for effective filtration of Cryptosporidium & Gardai			R - 120	
	Zinc (Zn)	Aesthetic 3				
Dalby	Alkalinity		4 R/MONTH	R - 49	R - 54	
	Aluminium (Al)	Aesthetic 0.2	1 SW/2 MONTH	SW - 7		
	Bicarbonate (HCO <sup>3</sup> )		1 GW/6 MONTH	GW - 18		
	Boron (B)	Heath 4				
	Calcium (Ca)					
	Carbonate (CO <sup>3</sup> )					

Scheme	Parameter	Water Quality Criteria <i>(mg/L unless otherwise specified)</i> <i>(ADWG guideline value)</i>	No. of Samples Required to be Collected <i>(as per the DWQMP)</i>	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments  <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Chloride (Cl)	Aesthetic 250				
	Conductivity				R - 684	
	Copper (Cu)	Aesthetic 1 Heath 2				
	Figure of Merit Ratio					
	Fluoride (F)	Heath 1.5				
	Hydrogen (H)					
	Hydroxide (OH)					
	Iron (Fe)	Aesthetic 0.3				
	Magnesium (mg)					
	Manganese (Mn)	Aesthetic 01 Heath 0.5				
	Mole Ratio					
	Nitrate (NO <sup>3</sup> )	Aesthetic 50				
	pH	Aesthetic 6.5 - 8.5pH			R - 400	
	pH Sat					
	Potassium (K)					
	Residual Alkalinity	Aesthetic 150				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Saturation Index					
	Silica	Aesthetic 80				
	Sodium (Na)	Aesthetic 180 Heath 180 ug/L				
	Sodium Absorpt. Ratio					
	Sulphate (SO4)	Aesthetic 250				
	Temporary Hardness				R - 54	
	Total Dissolved Ions					
	Total Dissolved Solids	Heath 500 µg/L Aesthetic 600 µg/L				
	Total Hardness 200	Aesthetic				
	True Colour 15	Aesthetic 15 HU				
	Turbidity	Aesthetic 5 NTU <1 NTU is the target for effective disinfection <0.2 NTU is the target for effective filtration of			R - 699	

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
		Cryptosporidium & Gardai				
	Zinc (Zn)	Aesthetic 3				
Jandowae	Alkalinity		1 R/MONTH	15		
	Aluminium (Al)	Aesthetic 0.2	1 SW/MONTH	12		
	Bicarbonate (HCO <sup>3</sup> )		1 GW/2 MONTH	17		
	Boron (B)	Heath 4				
	Calcium (Ca)					
	Carbonate (CO <sup>3</sup> )					
	Chloride (Cl)	Aesthetic 250				
	Conductivity				R - 791	
	Copper (Cu)	Aesthetic 1 Heath 2				
	Figure of Merit Ratio					
	Fluoride (F)	Heath 1.5				
	Hydrogen (H)					
	Hydroxide (OH)					
	Iron (Fe)	Aesthetic 0.3				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Magnesium (mg)					
	Manganese (Mn)	Aesthetic 01 Heath 0.5				
	Mole Ratio					
	Nitrate (NO <sup>3</sup> )	Aesthetic 50				
	pH	Aesthetic 6.5 - 8.5pH			R - 806	
	pH Sat					
	Potassium (K)					
	Residual Alkalinity	Aesthetic 150				
	Saturation Index					
	Silica	Aesthetic 80				
	Sodium (Na)	Aesthetic 180 Heath 180 ug/L				
	Sodium Absorpt. Ratio					
	Sulphate (SO <sub>4</sub> )	Aesthetic 250				
	Temporary Hardness					
	Total Dissolved Ions					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Total Dissolved Solids	Heath 500 µg/L Aesthetic 600 µg/L				
	Total Hardness 200	Aesthetic				
	True Colour 15	Aesthetic 15 HU				
	Turbidity	Aesthetic 5 NTU  <1 NTU is the target for effective disinfection  <0.2 NTU is the target for effective filtration of Cryptosporidium & Gardai				
	Zinc (Zn)	Aesthetic 3				
Miles	Alkalinity		1 R/MONTH	R - 15		
	Aluminium (Al)	Aesthetic 0.2	1 SW/MONTH	SW - 12		
	Bicarbonate (HCO <sup>3</sup> )		1 GW/6 MONTH			
	Boron (B)	Heath 4				
	Calcium (Ca)					
	Carbonate (CO <sup>3</sup> )					

Scheme	Parameter	Water Quality Criteria <i>(mg/L unless otherwise specified)</i> <i>(ADWG guideline value)</i>	No. of Samples Required to be Collected <i>(as per the DWQMP)</i>	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments  <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Chloride (Cl)	Aesthetic 250				
	Conductivity				R - 205	
	Copper (Cu)	Aesthetic 1 Heath 2				
	Figure of Merit Ratio					
	Fluoride (F)	Heath 1.5				
	Hydrogen (H)					
	Hydroxide (OH)					
	Iron (Fe)	Aesthetic 0.3				
	Magnesium (mg)					
	Manganese (Mn)	Aesthetic 01 Heath 0.5				
	Mole Ratio					
	Nitrate (NO <sup>3</sup> )	Aesthetic 50				
	pH	Aesthetic 6.5 - 8.5pH			R - 200	
	pH Sat					
	Potassium (K)					
	Residual Alkalinity	Aesthetic 150				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Saturation Index					
	Silica	Aesthetic 80				
	Sodium (Na)	Aesthetic 180 Heath 180 ug/L				
	Sodium Absorpt. Ratio					
	Sulphate (SO4)	Aesthetic 250				
	Temporary Hardness					
	Total Dissolved Ions					
	Total Dissolved Solids	Heath 500 µg/L Aesthetic 600 µg/L				
	Total Hardness 200	Aesthetic				
	True Colour 15	Aesthetic 15 HU				
	Turbidity	Aesthetic 5 NTU <1 NTU is the target for effective disinfection <0.2 NTU is the target for effective filtration of			R - 205	

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
		Cryptosporidium & Gardai				
	Zinc (Zn)	Aesthetic 3				
Tara	Alkalinity		1 R/MONTH	R - 8		
	Aluminium (Al)	Aesthetic 0.2	1 SW/MONTH	SW - 8		
	Bicarbonate (HCO <sup>3</sup> )			GW - 8		
	Boron (B)	Heath 4				
	Calcium (Ca)					
	Carbonate (CO <sup>3</sup> )					
	Chloride (Cl)	Aesthetic 250				
	Conductivity				R - 964	
	Copper (Cu)	Aesthetic 1 Heath 2				
	Figure of Merit Ratio					
	Fluoride (F)	Heath 1.5				
	Hydrogen (H)					
	Hydroxide (OH)					
	Iron (Fe)	Aesthetic 0.3				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Magnesium (mg)					
	Manganese (Mn)	Aesthetic 01 Heath 0.5				
	Mole Ratio					
	Nitrate (NO <sup>3</sup> )	Aesthetic 50				
	pH	Aesthetic 6.5 - 8.5pH			R - 1001	
	pH Sat					
	Potassium (K)					
	Residual Alkalinity	Aesthetic 150				
	Saturation Index					
	Silica	Aesthetic 80				
	Sodium (Na)	Aesthetic 180 Heath 180 ug/L				
	Sodium Absorpt. Ratio					
	Sulphate (SO <sub>4</sub> )	Aesthetic 250				
	Temporary Hardness					
	Total Dissolved Ions					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
	Total Dissolved Solids	Heath 500 µg/L Aesthetic 600 µg/L				
	Total Hardness 200	Aesthetic				
	True Colour 15	Aesthetic 15 HU				
	Turbidity	Aesthetic 5 NTU  <1 NTU is the target for effective disinfection  <0.2 NTU is the target for effective filtration of Cryptosporidium & Gardai				
	Zinc (Zn)	Aesthetic 3				
Wandoan	Alkalinity		1 R/MONTH	R - 12 GW - 3		
	Aluminium (Al)	Aesthetic 0.2				
	Bicarbonate (HCO <sup>3</sup> )					
	Boron (B)	Heath 4				
	Calcium (Ca)					
	Carbonate (CO <sup>3</sup> )					

Scheme	Parameter	Water Quality Criteria <i>(mg/L unless otherwise specified)</i> <i>(ADWG guideline value)</i>	No. of Samples Required to be Collected <i>(as per the DWQMP)</i>	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments  <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Chloride (Cl)	Aesthetic 250				
	Conductivity					
	Copper (Cu)	Aesthetic 1 Heath 2				
	Figure of Merit Ratio					
	Fluoride (F)	Heath 1.5				
	Hydrogen (H)					
	Hydroxide (OH)					
	Iron (Fe)	Aesthetic 0.3				
	Magnesium (mg)					
	Manganese (Mn)	Aesthetic 01 Heath 0.5				
	Mole Ratio					
	Nitrate (NO <sup>3</sup> )	Aesthetic 50				
	pH	Aesthetic 6.5 - 8.5pH			R - 103	
	pH Sat					
	Potassium (K)					
	Residual Alkalinity	Aesthetic 150				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Saturation Index					
	Silica	Aesthetic 80				
	Sodium (Na)	Aesthetic 180 Heath 180 ug/L				
	Sodium Absorpt. Ratio					
	Sulphate (SO4)	Aesthetic 250				
	Temporary Hardness					
	Total Dissolved Ions					
	Total Dissolved Solids	Heath 500 µg/L Aesthetic 600 µg/L				
	Total Hardness 200	Aesthetic				
	True Colour 15	Aesthetic 15 HU				
	Turbidity	Aesthetic 5 NTU  <1 NTU is the target for effective disinfection  <0.2 NTU is the target for effective filtration of			R - 98	

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <small>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</small>
		Cryptosporidium & Gardai				
	Zinc (Zn)	Aesthetic 3				
Warra	Alkalinity		1 R/2 MONTH	R - 6		
	Aluminium (Al)	Aesthetic 0.2	1 SW/MONTH	SW - 3		
	Bicarbonate (HCO <sup>3</sup> )					
	Boron (B)	Heath 4				
	Calcium (Ca)					
	Carbonate (CO <sup>3</sup> )					
	Chloride (Cl)	Aesthetic 250				
	Conductivity				R - 507	
	Copper (Cu)	Aesthetic 1 Heath 2				
	Figure of Merit Ratio					
	Fluoride (F)	Heath 1.5				
	Hydrogen (H)					
	Hydroxide (OH)					
	Iron (Fe)	Aesthetic 0.3				

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Magnesium (mg)					
	Manganese (Mn)	Aesthetic 01 Heath 0.5				
	Mole Ratio					
	Nitrate (NO <sup>3</sup> )	Aesthetic 50				
	pH	Aesthetic 6.5 - 8.5pH			R - 515	
	pH Sat					
	Potassium (K)					
	Residual Alkalinity	Aesthetic 150				
	Saturation Index					
	Silica	Aesthetic 80				
	Sodium (Na)	Aesthetic 180 Heath 180 ug/L				
	Sodium Absorpt. Ratio					
	Sulphate (SO <sub>4</sub> )	Aesthetic 250				
	Temporary Hardness					
	Total Dissolved Ions					

Scheme	Parameter	Water Quality Criteria (mg/L unless otherwise specified) (ADWG guideline value)	No. of Samples Required to be Collected (as per the DWQMP)	No. of Samples Collected and Tested by an External Laboratory	No. of Samples Collected and Tested Internally	Comments <i>*Incident No - if applicable - will be included in Comments section further detail in Section 6 Incidents reported to the regulator</i>
	Total Dissolved Solids	Heath 500 µg/L Aesthetic 600 µg/L				
	Total Hardness 200	Aesthetic				
	True Colour 15	Aesthetic 15 HU				
	Turbidity	Aesthetic 5 NTU  <1 NTU is the target for effective disinfection  <0.2 NTU is the target for effective filtration of Cryptosporidium & Gardai			R - 515	
	Zinc (Zn)	Aesthetic 3				

## 5 Compliance with Annual E.coli Rolling Annual Value

Table 11 - Compliance with Annual E.coli Rolling Annual Value

**CALCULATE PERCENTAGE USING A TWELVE (12) MONTH 'ROLLING' ANNUAL VALUE**

*The Public Health Regulation 2005 (the regulation) require that 98 per cent of samples taken in a 12-MONTH period should contain no E. Coli.*

*This requirement is referred to as the 'annual value' in Schedule 3A of the regulation.*

*This requirement comes into effect once you have 12 MONTHs data and should be assessed every MONTH based on the previous 12 MONTHs data (so that it is a 'rolling' assessment).*

**Drinking water scheme: BELL Verification Monitoring Results (2020 - 2021)**

	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>
<b>No. of samples collected</b>	43	47	43	43	73	39	43	43	45	45	44	44
<b>No. of samples collected in which E. coli is detected (i.e., a failure)</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>No. of samples collected in previous 12-MONTH period</b>	171	207	245	256	269	334	366	397	421	456	487	521
<b>No. of failures for previous 12-MONTH period</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>% of samples that comply</b>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Compliance with 98% annual value</b>	YES											

*Drinking water scheme: CHINCHILLA Verification Monitoring Results (2020 - 2021)*

	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>
<i>No. of samples collected</i>	34	34	34	34	34	34	34	34	34	34	33	33
<i>No. of samples collected in which E. coli is detected (i.e., a failure)</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>No. of samples collected in previous 12-MONTH period</i>	135	160	185	208	232	257	282	299	317	332	358	383
<i>No. of failures for previous 12-MONTH period</i>	1	1	1	1	1	1	1	1	1	1	1	1
<i>% of samples that comply</i>	99.3%	99.4%	99.5%	99.5%	99.6%	99.6%	99.6%	99.7%	99.7%	99.7%	99.7%	99.7%
<i>Compliance with 98% annual value</i>	YES											

*Drinking water scheme: CONDRAMINE Verification Monitoring Results (2020 - 2021)*

	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>
<b>No. of samples collected</b>	15	16	16	16	16	15	16	16	16	15	16	16
<b>No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>No. of samples collected in previous 12-MONTH period</b>	153	152	155	157	159	161	165	168	170	172	167	181
<b>No. of failures for previous 12-MONTH period</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>% of samples that comply</b>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Compliance with 98% annual value</b>	YES											

*Drinking water scheme: DALBY Verification Monitoring Results (2020 - 2021)*

	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>
<b>No. of samples collected</b>	30	30	35	33	25	23	33	30	36	35	32	37
<b>No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>No. of samples collected in previous 12-MONTH period</b>	301	299	302	310	311	314	312	318	320	323	324	349
<b>No. of failures for previous 12-MONTH period</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>% of samples that comply</b>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Compliance with 98% annual value</b>	YES											

*Drinking water scheme: JANDOWAE Verification Monitoring Results (2020 - 2021)*

	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>
<b>No. of samples collected</b>	30	39	30	30	21	21	29	29	29	29	27	27
<b>No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>No. of samples collected in previous 12-MONTH period</b>	302	303	318	321	315	287	276	275	273	278	297	319
<b>No. of failures for previous 12-MONTH period</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>% of samples that comply</b>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Compliance with 98% annual value</b>	YES											

<i>Drinking water scheme: MILES Verification Monitoring Results (2020 - 2021)</i>												
	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>
<i>No. of samples collected</i>	19	15	17	17	17	14	16	17	17	26	5	5
<i>No. of samples collected in which E. coli is detected (i.e., a failure)</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>No. of samples collected in previous 12-MONTH period</i>	353	335	318	302	281	269	283	281	269	254	246	215
<i>No. of failures for previous 12-MONTH period</i>	1	1	1	1	1	1	1	1	1	1	1	0
<i>% of samples that comply</i>	99.7%	99.7%	99.7%	99.7%	99.6%	99.6%	99.6%	99.6%	99.6%	99.6%	99.6%	100.0%
<i>Compliance with 98% annual value</i>	YES											

<i>Drinking water scheme: TARA Verification Monitoring Results (2020 - 2021)</i>												
	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>
<i>No. of samples collected</i>	4	9	4	9	6	5	5	3	8	14	9	9
<i>No. of samples collected in which E. coli is detected (i.e., a failure)</i>	0	0	0	0	0	0	0	0	0	0	0	0
<i>No. of samples collected in previous 12-MONTH period</i>	149	139	131	123	109	101	89	55	43	33	16	6
<i>No. of failures for previous 12-MONTH period</i>	1	1	1	1	1	1	1	0	0	0	0	0
<i>% of samples that comply</i>	99.3%	99.3%	99.2%	99.2%	99.1%	99.0%	98.9%	100.0%	100.0%	100.0%	100.0%	100.0%
<i>Compliance with 98% annual value</i>	YES											

*Drinking water scheme: WANDOAN Verification Monitoring Results (2020 - 2021)*

	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>
<b>No. of samples collected</b>	15	15	15	15	15	11	11	16	11	11	13	14
<b>No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>No. of samples collected in previous 12-MONTH period</b>	117	112	106	98	84	73	63	51	37	33	21	5
<b>No. of failures for previous 12-MONTH period</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>% of samples that comply</b>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
<b>Compliance with 98% annual value</b>	YES											

*Drinking water scheme: WARRA Verification Monitoring Results (2020 - 2021)*

	<i>Jul</i>	<i>Aug</i>	<i>Sep</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>Jun</i>
<b>No. of samples collected</b>	26	29	26	26	23	23	26	26	31	28	26	27
<b>No. of samples collected in which <i>E. coli</i> is detected (i.e., a failure)</b>	0	0	0	0	0	0	0	0	1	0	0	0
<b>No. of samples collected in previous 12-MONTH period</b>	169	155	145	131	114	86	74	62	46	32	20	11
<b>No. of failures for previous 12-MONTH period</b>	0	0	0	0	0	0	0	0	0	1	1	1
<b>% of samples that comply</b>	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	96.9%	95.0%	90.9%
<b>Compliance with 98% annual value</b>	YES	NO	NO	NO								

## 6 Incidents reported to the regulator

The incidents reported to the regulator and management actions undertaken over the 2020 - 2021 financial year are provided in this section.

**Table 12**– Incidents reported to the regulator

Report No.	Town	Incident Date	Incident	Open/ Closed	Actions Taken Date Closed* if applicable	Corrective Actions taken
DWI-480-20-08651	Warra	13/10/2020 17/11/2020	Total Trihalomethanes	Open	<p>Investigated the incident based on available data as there was about 14 days between sample and obtaining lab results. Moving to Monthly samples -1 per MONTH which will potentially provide better trending. This action has been included in the current DWQMP review. No public health notification is required.</p> <p><b>26/11/2021</b> Please note Dam Aeration Install project has been awarded. This project is unable to be commenced until such time as the area is dry enough to allow access.</p>	<p><b>10/11/2020</b> The water tower is quite large by comparison to the demand and typically holds 3-10 days total supply and is equipped with a re-chlorination facility on the outflow, however this system is on-off only and is not flow paced. Given this clear trend the water tower operating levels have been reduced to operate at about 60% of the previous capacity to reduce water age. Hypochlorite age at the re-chlorination facility is also being reduced by installing a smaller storage tank. The dose rate and dosing regime is also being reviewed to determine appropriateness. If operation at lower tower levels proves to have no negative impact, further reductions in tower capacity is a long-term aim. Likewise changes in town high service pumping are proposed for future investigation, to ensure that the tower contents are regularly cycled. Algae growth in the raw water supply dam is suspected to be a source of organic carbon and bromides which are implicated in the formation of the disinfection by products. WDRC are gearing up to regularly monitor algae counts in the dam and make control decisions earlier based on those levels. This is intended to reduce disinfection by-product precursors in the long term. This action has been included in the current DWQMP review.</p>
DWI-480-20-08652	Warra	13/10/2020	Total Trihalomethanes and Dichloroacetic Acid	Open	<p>Investigated the incident based on available data as there was about 14 days between sample and obtaining lab</p>	<p>The water tower is quite large by comparison to the demand and typically holds 3-10 days total supply and is equipped</p>

Report No.	Town	Incident Date	Incident	Open/ Closed	Actions Taken Date Closed* if applicable	Corrective Actions taken
					results. Moving to monthly samples -1 per MONTH which will potentially provide better trending. This action has been included in the current DWQMP review. No public health notification is required.	with a re-chlorination facility on the outflow., however this system is on-off only and is not flow paced. Given this clear trend the water tower operating levels have been reduced to operate at about 60% of the previous capacity to reduce water age. Hypochlorite age at the re-chlorination facility is also being reduced by installing a smaller storage tank. The dose rate and dosing regime is also being reviewed to determine appropriateness. If operation at lower tower levels proves to have no negative impact, further reductions in tower capacity is a long-term aim. Likewise changes in town high service pumping are proposed for future investigation, to ensure that the tower contents are regularly cycled. Algae growth in the raw water supply dam is suspected to be a source of organic carbon and bromides which are implicated in the formation of the disinfection by products. WDRC are gearing up to regularly monitor algae counts in the dam and make control decisions earlier based on those levels. This is intended to reduce disinfection by-product pre-cursors in the long term. This action has been included in the current DWQMP review.
DWI-480-20-08649	Condamine	14/10/2020 25/11/2020	Total Trihalomethanes	Open	Investigated the incident based on available data as there was about 14 days between sample and obtaining lab results. Moving to monthly samples -1 per MONTH which will potentially provide better trending. This action has been included in the current DWQMP review. No public health notification is required.	The following long term actions to reduce these events have been included in the current DWQMP review:1) An online chlorine monitor with alarms is proposed for installation this financial year to reduce the likelihood of excessive chlorine dosing.2) The existing small reservoirs will be re-arranged to form a dedicated chlorine contact tank to provide better management of chlorine residuals and overall dosing.(Planned for 20/21).3) In appropriate conditions trial operation of the plant in enhanced coagulation mode to reduce DBP precursors. (Planned when conditions allow).

Report No.	Town	Incident Date	Incident	Open/ Closed	Actions Taken Date Closed* if applicable	Corrective Actions taken
DWI-480-20-08653	Condamine	14/10/2020	Total Trihalomethanes and Dichloroacetic Acid	Open	Investigated the incident based on available data as there was about 14 days between sample and obtaining lab results. Moving to monthly samples -1 per MONTH which will potentially provide better trending. This action has been included in the current DWQMP review. No public health notification is required.	The following long term actions to reduce these events have been included in the current DWQMP review:1) An online chlorine monitor with alarms is proposed for installation this financial year to reduce the likelihood of excessive chlorine dosing.2) The existing small reservoirs will be re-arranged to form a dedicated chlorine contact tank to provide better management of chlorine residuals and overall dosing.(Planned for 20/21).3) In appropriate conditions trial operation of the plant in enhanced coagulation mode to reduce DBP precursors. (Planned when conditions allow).
DWI-480-21-08846	Miles	21/12/2020 19/01/2021	Total Trihalomethanes	Open	Re-sample has been requested and operator has advised this will be carried out on Monday 18 December 2021.	
DWI-480-21-08907	Warra	17/03/2021	E.coli	Open	<p>The initial response included the following: Resampling and testing.</p> <ol style="list-style-type: none"> <li>1) Review of operational data</li> <li>2) Review of the site.</li> <li>3) Confirmation of operational procedures</li> <li>4) Discussion with operational staff about the circumstances and environment at the time of testing.</li> </ol> <p>After resampling on the 18<sup>th</sup> daily sampling at several test points around the town was continued until the 21<sup>st</sup>. There were no further detections and free chlorine residuals were generally good. Carryover of potassium permanganate continued to be an issue and turbidity was variable but generally higher than 1ntu throughout the system.</p> <p>No definitive cause for the detection was able to be determined.</p> <p>On the 23/3/2021 routine microbiological samples were collected and sent to the QHFSS laboratories. On the</p>	<ol style="list-style-type: none"> <li>1. An additional dosing point is to be installed on the outlet of the tower, to allow easy and quick boosting of the chlorine dose if required without the risk of dealing with long holding times in the tower. This is relatively straightforward. To be done 31/5/2021. Plans and procedures developed for the isolation of the tower and operation of the network. A basic schematic currently exists, and an informal procedure was used during this event. These procedures to be formalised. To be done by 30/10/2021.</li> <li>2. The "Backwash" line from the WTP should have an isolation valve installed to allow isolation from the network. The backwash line was used in this incident as a pressure bleed and feedback from the high service pumps for the period when the tower was offline. However, when the line failed there was no isolation valve. This presents an ongoing reliability risk. To be done by 30/6/2021</li> </ol>

Report No.	Town	Incident Date	Incident	Open/ Closed	Actions Taken Date Closed* if applicable	Corrective Actions taken
					<p>25/3/2021 the laboratory advised that a sample from the tower exit test point had given a result of 2cfu/100ml MPN, but all the remaining samples were clear. QWSR were notified of this detection at about 1.30pm. All sites were double resampled with samples taken for in house and QHFSS testing. Additionally, an initial inspection was performed on the water tower, but this was not comprehensive due to complex access requirements</p> <p>The following day, the tower was drained and inspected, but due to a pipe burst elsewhere in the system, low production from the plant, and the requirements for main and tower flushing the towns supply failed for a period of several hours.</p> <p>Although the tower was in fair condition with only a small amount of accumulated sludge, the inspection revealed that the flashing around one side of the hatch had been removed allowing rainwater from the roof to be channelled into the tank. This was significant because both sampling events that yielded positive results had been performed in the rain. All negative tests were during periods of fine weather.</p> <p>On the 30/3/2021 the tower hatch was sealed using a temporary paint on sealing product, which could be easily removed to access the tower if necessary.</p> <p>Sampling and testing at multiple test points around the town continued until the 02/4/2021 with no further detections. Daily presence absence testing of the tower exit test point has continued and will continue, but to date these tests have not shown any further detections.</p> <p>The draw off point depth from the off-stream storage was reduced from 1.5 to 0.5m below the surface and this together with a much-reduced permanganate dose</p>	<ol style="list-style-type: none"> <li>3. Safety improvements for access to the tower and the chemical dosing shed is to be investigated. These investigations have already been undertaken and a report developed.</li> <li>4. The provision of white mud boots for potable water work to be considered. Arrangements for the Jandowae/Warra team to have such boots has already been made. The provision of white boots to all WDRC operators will proceed progressively.</li> <li>5. The Incident Management Protocol in the DWQMP needs to be reviewed particularly with relation to task segregation, communication, and fatigue management. Additionally, the feedback from field operators is to be improved with a formal process to ensure such feedback is timely is to be considered. This has been identified for the next review which is likely to be at the end of 2021.</li> <li>6. The E. coli testing procedure requirement regarding time of sampling to be reinforced. This has already been communicated to all teams, and the practices reviewed for implementation.</li> <li>7. Equipment requirements for Incident Response to be considered and a plan for how this should be managed developed. Any specialist equipment requirements to be considered. Each remote plant may need to have an incident response kit. A pilot incident response kit has been developed for discussion with operators.</li> <li>8. Adequate supply of micro test bottle and standard sampling bottles to be maintained at each plant. Do not rely on supplies in vehicles. These are included in the</li> </ol>

Report No.	Town	Incident Date	Incident	Open/ Closed	Actions Taken Date Closed* if applicable	Corrective Actions taken
					resulted in a gradual reduction in turbidity progressively dropping to below 1.0ntu in the network. There is no longer any permanganate carry over and chlorine residuals have been maintained normally. On the 8/4/2021 a formal debrief was undertaken with all staff involved in the incident.	pilot incident response kit. 9. Permanent repairs on the Water tower hatch to be instigated. A contract for the hatch upgrade has been awarded. Expected completion 30/6/2021. The temporary repairs can remain in place until that time.
DWI-480-21-08954	Tara	7/04/2021	Chlorate	Open	Sample taken on the 7th April 2021. The test report was formulated on the 21st April 2021. Council received the report on the 28th April 2021. The Chlorine tank was refilled with Chlorine on the 23rd April 2021.	The Tara team have been requested to recommence routine Chlorine strength testing as a means of monitoring Chlorine age. The next scheduled Chlorate test is approximately the 7th of May 2021.
DWI-480-21-08959	Jandowae	12/04/2021	Trichloroacetic Acid (TCAA)	Open	Officers requested to flush main and re-sample at this location. This will be carried out on 6th May 2021.	

## 7 Customer complaints

WDRC received 17 complaints relating to water quality during 2020 - 2021

**Table 13 –Customer complaints about water quality**

Scheme	Health concern	Dirty water	Taste and odour	Other
Bell	0	0	0	0
Chinchilla	0	11	1	0
Condamine	0	0	0	0
Dalby	0	0	0	1
Jandowae	0	0	0	0
Miles	0	0	0	0
Tara	0	0	0	0
Wandoan	0	0	0	0
Warra	0	4	0	0
<b>Total</b>	<b>0</b>	<b>15</b>	<b>1</b>	<b>1</b>

## **8 DWQMP review outcomes**

A review was not conducted or required during the reporting period 01/07/2020 - 30/06/2021.

## **9 DWQMP audit outcomes**

An audit was not conducted or required during the reporting period 01/07/2020 - 30/06/2021.