

Western Corridor Recycled Water Scheme Recycled Water Management Plan Annual Report 2018-19

Scheme Reference Number SRN013
Service Provider SP507



Revision 01 | December 2019



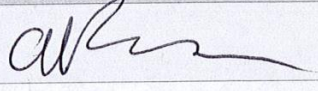
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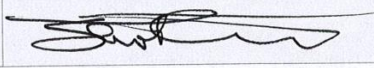
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Department of Natural Resources Mines and Energy	Water Supply Regulator

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01	D19/175351	Manager, Technical Support and Improvement	2/12/2019	Chief Operating Officer

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Executive summary

The Queensland Bulk Water Supply Authority trading as Seqwater (**Seqwater**) is a party to the multiple-entity Western Corridor Recycled Water Scheme (**WCRWS**). On 28 May 2018, under the Notice for the Decision (**Notice of Decision**), the Water Supply Regulator (**WSR** or **Regulator**) approved Seqwater’s application to resume the supply of recycled water under the WCRWS Recycled Water Management Plan (**RWMP**). The Notice for the Decision states that the WCRWS is approved for supply of recycled water from the scheme to the extent it relates to electricity generation.

The purpose of this annual report is to provide the Regulator with information on the overall performance of the WCRWS for the period 1 July 2018 to 30 June 2019 (**reporting period**). This annual report has been produced in accordance with the Department of Natural Resources, Mines and Energy (**DNRME**) Annual Reporting Guidelines for Recycled Water Schemes. This report also provides an accountability mechanism to users of the recycled water and to the general public.

During the reporting period the WCRWS was available to supply recycled water to meet the Stanwell Corporation’s Swanbank Power Station demand. The Luggage Point Advanced Water Treatment Plant (**AWTP**) was the only AWTP in the WCRWS that was operable during this time. Ongoing monitoring confirmed the production and supply of this water was consistently compliant with the Class A+ water quality criteria. During this reporting period Luggage Point AWTP provided a cumulative volume of 1,079 ML of recycled water to Swanbank Power Station and in doing so recorded 10,077 individual results collected from the Luggage Point AWTP Point of Supply. The Scheme Manager RWMP is in the process of internal review and will be submitted to the Regulator for approval in the coming financial year. There were no incidents or Critical Limit exceedances recorded. There were no audits conducted during this time, and there were no membrane units placed into preservation.

As specified in the Notice of Decision, the WCRWS was not approved for supply of recycled water for augmentation of drinking water supply and it did not undertake this activity. However, the recycled water produced and supplied from Luggage Point AWTP consistently complied with the water quality criteria for augmentation of drinking water supply, demonstrating the AWTPs of the scheme are capable of producing recycled water that is of a quality suitable to augment drinking water supply.

Seqwater submitted a revised WCRWS Validation Program to the Regulator in June 2019. This revision was undertaken to align the content of the WCRWS Validation Program with recent regulatory changes and to capture the implication of these changes on operations and monitoring of source water and recycled water. The amended WCRWS Validation Program was approved by WSR on 9 August 2019.

1 Annual reporting compliance

In 2013 the WCRWS was placed into ‘care and maintenance’ for a nominal estimated period of 15 years. On 28 April 2014 Seqwater submitted a Notice of Unscheduled Stoppage under section 208 of the *Water Supply (Safety & Reliability) Act 2008 (the Act)* to the Regulator, requesting that the RWMP be suspended. Pursuant to section 214 of the Act, a Notice of Suspension was issued by the Regulator on 11 June 2014. On 23 February 2018 Seqwater applied to the Regulator to approve the resumption of recycled water supply under the RWMP from the WCRWS for electricity generation. This application was approved by the Regulator on 28 May 2018, to the extent it related to the supply of recycled water from the scheme for electricity generation.

Prior to the reporting period, the WCRWS last supplied recycled water in December 2013. Between January 2014 and June 2018 recycled water was produced by Luggage Point AWTP for the purpose of “care and maintenance” with flows being used to maintain asset condition of the WCRWS pipeline network and to reduce

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risk to the environment if a leak were to occur in the network. This recycled water was not supplied for any end uses and was discharged to the environment, in accordance with the environmental approvals.

Since 2014 the Act, the *Public Health Regulation 2018* (Qld) (**PHR**) and Australian Drinking Water Guidelines 2011 (May 2019 version) (**ADWG**) have been revised and updated, requiring adjustment to the WCRWS Validation Program. The below sections summarise these changes.

1.1 Legislative changes

1.1.1 *Water Supply (Safety and Reliability) Act 2008 (the Act)*

The Act has been revised ten times between June 2014 and July 2019. Not all revisions have included changes that impact recycled water regulation. Previous versions of the Act have stated that schemes approved for the supply of recycled water for use in electricity generation are declared as critical schemes. The current revision of the Act, effective at 1 July 2019, has redefined what is declared as a critical scheme. This definition is detailed in section 301 of the Act, as shown below:

301 Making declaration

- (1) *The regulator may declare a recycled water scheme to be a critical recycled water scheme if the regulator reasonably believes the declaration is necessary—*
 - (a) *to maintain continuity of operation of the scheme to meet the essential water supply needs of the community or industry; or*
 - (b) *to ensure the appropriate management of risks to public health posed by the supply of recycled water under the scheme.*
- (2) *Without limiting subsection (1), the regulator must declare a recycled water scheme to be a critical recycled water scheme if—*
 - (a) *recycled water is supplied, or proposed to be supplied, under the scheme to augment a supply of drinking water; or*
 - (b) *under the scheme, at least 500kL of recycled water a day is supplied, or proposed to be supplied, to premises by way of a dual reticulation system.*

The Notice of the Decision provides approval for the WCRWS to supply recycled water for electricity generation only. However, section 4.1 of the Notice for the Decision states that the WCRWS is declared a critical recycled water scheme.

1.1.2 Water quality criteria

The WCRWS is currently approved only for the supply of recycled water for electricity generation and this criteria has not been altered by changes to the PHR. The water quality criteria change affects the water quality criteria required for recycled water supplied to ‘augment a drinking water supply’.

1.1.2.1 *Public Health Regulation 2018 (Qld)*

Substantial changes to the standards for augmentation of drinking water supply occurred when the *Public Health Regulation 2005* (Qld) was repealed by the PHR. This change included the removal of many standards, such as Bromodichloromethane, and the addition of others as well as changes to the standard values. The main change has been the explicit inclusion of ADWG health guideline values as standards and as such these standards may change over time as the ADWG is reviewed. These are supplemented by a series of recycled water specific parameter health standards.

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1.1.2.2 ADWG and Queensland Department of Health (DoH) interim values

In addition to the standards identified in the PHR and the ADWG, the DoH have requested the inclusion of Interim Standards values for Chlorate, Lamotrigine, Valsartan and Imidacloprid. These have been included in the WCRWS 'water quality criteria' for recycled water used to augment a drinking water supply.

Table 1 details the DNRME requirements for the content of this report, as specified in:

- the Act;
- Annual Reporting Guideline for Water Recycling Schemes, current version dated September 2010;
- conditions in the Notice of Decision for the RWMP for the WCRWS.

Table 1: Annual report requirements

Annual report requirements			Seqwater compliance
	Act section	Annual Reporting Guideline	
The relevant entity for a recycled water scheme must prepare an annual report for each financial year after a recycled water management plan for the scheme has been approved.	s273(1) of the Act	Section 2.3	This report is for the 2018 to 2019 financial year.
The annual report must—			
a. be prepared in accordance with the guidelines, if any, made by the regulator about the preparation of annual reports.	s273(2)(a) of the Act	Section 1 to section 2.12 (inclusive)	This report is aligned with the Annual Reporting Guidelines for Recycled Water Schemes.
b. state the outcome of any review of the recycled water management plan in the financial year to which the annual report relates, and how the matters raised in the review have been addressed.	s273(2)(b) of the Act	Section 2.4	Section 4 Reviews – there were no reviews undertaken in the 2018 to 2019 financial year.
c. contain details of the findings of, and any recommendations stated in, an internal audit report under section 260 or a regular audit report under section 261 given to the regulator in the financial year.	s273 (2)(c) of the Act	Section 2.4	Section 5 Audits – there were no audits undertaken in the 2018 to 2019 financial year.

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Annual report requirements			Seqwater compliance
	Act section	Annual Reporting Guideline	
d. contain details of the information given to the regulator under section 270 or 271 in the financial year.	s273 (2)(d) of the Act	Section 2.4	Section 6 Prescribed incidents – there were no incidents recorded in the 2018 to 2019 financial year.
The relevant entity must give a copy of the annual report to the regulator within 120 business days after the end of the financial year.	s273(3) of the Act	Section 2.3	This report has been submitted to the regulator within the specified time period.
If a relevant entity is a recycled water provider for a single entity recycled water scheme, the annual report may be combined with a report given to the regulator under section 141.	s273(4) of the Act		The WCRWS is a multiple-entity scheme. As such this requirement does not apply.

2 Introduction

2.1 Purpose

The purpose of this annual report is to provide the Water Supply Regulation (**WSR** or **Regulator**) of DNRME with information on the overall performance of the Western Corridor Recycled Water Scheme (**WCRWS**) for the period 1 July 2018 to 30 June 2019 (**reporting period**). This report also provides an accountability mechanism to users of the recycled water and to the general public.

2.2 Scheme overview

2.2.1 Western Corridor Recycled Water Scheme

The WCRWS is one of the largest water recycling schemes in the world, increasing and diversifying South East Queensland's water sources.

The Scheme has three advanced water treatment plants (**AWTPs**) located at Bundamba, Gibson Island and Luggage Point. At these plants treated water supplied from six existing sewage treatment plants (Bundamba, Gibson Island, Goodna, Luggage Point, Oxley Creek and Wacol) located throughout Brisbane and Ipswich, is further treated to produce recycled water using world best-practice.

More than 200 kilometres of large diameter pipelines have been constructed, connecting the sewage treatment plants, AWTPs and end users, including Wivenhoe Dam.

The WCRWS has the capacity to deliver up to 232 million litres (**ML**) of water a day to power stations and industry and to augment Wivenhoe Dam, subject to the availability of inflowing water from the Sewage Treatment Plants (**STPs**). The currently available flows the STPs practically limit the WCRWS to a capacity of about 180 ML/day.

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2.2.2 Current status

Seqwater made the decision during 2013 to place the WCRWS into a state of 'care and maintenance'. This state was selected with the aim to make the plants more cost-effective and improve the return on the assets over their life. The 'care and maintenance' state was based, for the purposes of planning, on a 15 year shutdown period, with an ability to return the scheme to full operation within two years of a decision to restart the Scheme.

The Water Security Program 'Water for Life South East Queensland's Water Security Program 2016-2046' identifies that the trigger to consider the return the WCRWS to full operation (~180 ML/day capacity) when the Key Bulk Water Storages fall to a combined level of 60 percent, with a two year window to restart the WCRWS at full operation.

In 2018 a single process train at Luggage Point AWTP was restarted with the aim of reducing risk of a full WCRWS restart. It would also enable supply to industrial uses to be explored and enable water quality monitoring of Purified Recycled Water (**PRW**) to be resumed. Seqwater applied to resume supply of recycled water for electricity generation on 23 February 2018 and the WSR approved the RWMP for this use only on 28 May 2018 by way of the Notice of Decision.

This permitted work to be undertaken for the commissioning verification and validation of Luggage Point AWTP's Train 1 process train. This process was required to:

1. Facilitate risk minimisation by way of ground truthing works required should a full scheme recommissioning for the supply of recycled water compliant with the water quality criteria for augmentation of a drinking water storage.
2. Confirm that the AWTP process is able to be successfully restarted to produce the quality of recycled water required to augment drinking water supply.
3. Supply recycled water for electricity generation, reducing demand on SEQ drinking water storages that would otherwise be used for this supply.

2.2.3 Validation Program review

Seqwater submitted a revised WCRWS Validation Program to WSR in 2019. This revision was undertaken to align the content of the WCRWS Validation Program with recent regulatory changes and to capture the implication of these changes on operations and monitoring of source water and recycled water. The amended WCRWS Validation Program was approved by WSR on 9 August 2019.

2.3 Luggage Point Train 1 Commissioning Validation and Verification

2.3.1 Luggage Point Train 1 Commissioning Verification

Commissioning verification of the Luggage Point AWTP Train 1 recycled water was undertaken in the reporting period. The commissioning verification monitoring was undertaken from 2 July 2018 to 25 November 2018 (inclusive) with a commissioning verification monitoring pause period between 27 August 2018 to 21 October 2018 (inclusive). This pause period was in response to erroneous analyses reported by the contract laboratory. This commissioning verification was undertaken by Seqwater.

This verification assessment determined that the recycled water produced by Train 1 at Luggage Point AWTP was overall consistent with the requirements stated in the WCRWS Validation Program and that the recycled water produced met the standards for augmentation of drinking water supply in the PHR. There were minor inconsistencies with monitoring and analytical sensitivity observed. However, these can be largely attributed to the current transition of monitoring to align with newly approved WCRWS Validation Program method requirements and investigation of analytical methods that yield lower Limits of Reporting.

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2.3.2 Luggage Point Train 1 commissioning validation

Commissioning validation of the five Critical Control Points (**CCP**) at Luggage Point AWTP Train 1 was undertaken in the reporting period. The commissioning validation was undertaken from 23 October 2018 to 19 November 2018 (inclusive). The validation of the CCPs were conducted by Seqwater and Viridis Consultants Pty Ltd. These reports were not finalised in the reporting period.

2.3.2.1 Seqwater CCP commissioning validation conclusions

CCP1 STP (BNR Activated Sludge) Process, CCP2 Membrane Filtration Process, CCP4 Ultraviolet Disinfection and Advanced Oxidation Process and CCP5 Chlorine Disinfection Process (chlorate control).

Seqwater undertook the validation of CCP1 STP (BNR Activated Sludge) Process, CCP2 Membrane Filtration Process, CCP4 Ultraviolet Disinfection and Advanced Oxidation Process and CCP5 Chlorine Disinfection Process (chlorate control).

This report was finalised in August 2019. Seqwater were successful in demonstrating that CCP1 STP (BNR Activated Sludge) Process, CCP2 Membrane Filtration Process, CCP4 Ultraviolet Disinfection and Advanced Oxidation Process and CCP5 Chlorine Disinfection Process (chlorate control) were capable of achieving the claimed validated LRVs and recorded consistent operations within the Critical Limits.

In addition to determining LRV capabilities, the commissioning validation identified a number of improvement opportunities for more robust monitoring and control. These have been included the “Punch List” for improvement works to be undertaken in the 2019 to 2020 financial year and as part of restart activities at the other AWTPs when this is triggered under the South East Queensland’s Water Security Program 2016-2046.

2.3.2.2 Viridis Consultants Pty Ltd CCP commissioning validation conclusions

2.3.2.2.1 CCP3 Reverse Osmosis Process

Work was undertaken to demonstrate the Reverse Osmosis (**RO**) Train can operate within the Critical Limits and control required to for the claimed microbial Log Reduction Value (**LRV**) and validate the RO Train Critical Limits against the WaterVal Validation Protocol.

This report was finalised in July 2019. Viridis successfully demonstrated that the RO Train is capable of achieving the claimed validated microbial LRV, defined the operating envelop and recorded consistent operations within the Critical Limit.

2.3.2.2.2 CCP5 Chlorine Disinfection Process (Disinfection)

Work was undertaken to demonstrate the Chlorine Disinfection Process can achieve the Critical Limits and control required for the claimed microbial LRV and validate the Critical Limits against the WaterVal Validation Protocol. This validation included a free chlorine tracer study and an investigation of measurement uncertainty to accurately determine the chlorine contact time in accordance with the WaterVal Validation Protocol.

This report is being finalised. Viridis successfully demonstrated the Chlorine Disinfection Process is capable of achieving the claimed validated microbial LRV, defined the operating envelop and recorded consistent operations within the Critical Limit.

2.4 Membrane units placed into preservation

There were 0 membrane units from Luggage Point AWTP placed into preservation for more than 1 month in the reporting period. No membranes are installed at the Gibson Island or Bundamba AWTPs.

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3 Recycled water compliance

Section 6 of the Notice of Decision clearly outlines the approved supply uses of recycled water from the WCRWS between 1 July 2018 and 30 June 2019.

3.1 Gibson Island AWTP Point of Supply

The Gibson Island AWTP is capable of producing recycled water for supply to Swanbank Power Station and to the other end uses in the scheme. The Gibson Island AWTP was non-operational and did not at any time produce or supply recycled water during the reporting period. As such no monitoring from the Gibson Island Point of Supply was required.

3.2 Luggage Point AWTP Point of Supply

The resumption of recycled water supply for electricity generation purposes was approved under the Notice for the Decision for the WCRWS RWMP Scheme Manager Plan, Seqwater Scheme Provider Plan and QUU Scheme Provider Plan. Under this approval, the Luggage Point AWTP was available to supply recycled water to meet the demand of Stanwell Corporations Swanbank Power Station throughout the reporting period. During the reporting period, if the Swanbank Power Station did not require recycled water, the Luggage Point AWTP produced recycled water at minimum flows to maintain recycled water quality as well as ensure asset condition and plant readiness. Recycled water produced in surplus to demand was used to maintain network asset integrity and reduce environmental risk, with small volumes also discharged to the environment if required.

Under this approval the Luggage Point AWTP supplied 1079 ML of recycled water to the Swanbank Power Station via the connection at the Bundamba AWTP and the Bundamba Point of Supply. Under this operation a peak supply of recycled water to Bundamba Power Station of 9.2 ML/day was recorded.

3.2.1 Class A+ compliance

The RWMP identifies that recycled water at the Luggage Point AWTP Point of Supply is to meet the requirements for Class A+ recycled water.

Microbial monitoring was scheduled weekly at the Luggage Point AWTP Point of Supply. Sample collection could only occur if the scheduled interval aligned with recycled water being transferred at that time. Of the 52 potential monitoring intervals, the Luggage Point AWTP Point of Supply was able to have samples collected on 44 intervals. The Luggage Point AWTP Point of Supply compliance against the Class A+ water quality criteria are shown below in Table 2. Each of these samples were analysed and yielded non-detect results with exception for the FRNA coliphage positive detection results detailed in Table 3 below.

Table 2: Luggage Point AWTP Point of Supply Class A+ Compliance

Parameter	Regulated standard (units)	Water Quality A+ Criteria	LOR	Maximum	Annual 95% pass Value	No. of Results Available
FRNA Coliphages	PFU/100mL	<1 PFU/100 mL in 95% of samples	1	1	PASS <1 PFU/100 mL in 95% of samples	44

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Escherichia coli	CFU/100 mL	<1 CFU/100 mL in 95% of samples	1	ND	ND	44
Somatic Coliphages	PFU/100mL	<1 PFU/100 mL in 95% of samples	1	ND	ND	44
Clostridium pefringes	CFU/100 mL	<1 CFU/100 mL in 95% of samples	1	ND	ND	44

Table 3: Positive Microbial Indicator Detection and Investigation Findings

Parameter	Monitoring frequency	Regulated standard (units)	Measured value	Investigation Details
FRNA Coliphages	Weekly	PFU/100m L	1 PFU/100 mL 24/09/2018	<p>The existing regulatory reporting requirements did not require WSR notification and did not require resampling.</p> <p>During weekly microbial monitoring a single positive detection of FRNA Coliphage at the Luggage Point AWTP Point of Supply monitoring point was recorded (SZ-GIBPRW-LPINPRWC). An investigation determined that The Luggage Point AWTP had produced recycled water in compliance with all CCP and Critical Limit monitoring and the monitoring and control requirements of the WCRWS Validation Program. Further to this the presence of free chlorine as the secondary disinfectant within specified range indicated that contamination of the recycled water process was very unlikely.</p> <p>The investigation concluded by determining that the result was most likely the due to of either contamination during the sample collection or the laboratory analysis. The sub sequent sample on 2 October 2018 returned as non-detect for all microbial contamination indicators.</p>

The commissioning verification and validation undertaken at Luggage Point for Train 1 demonstrated compliant processes and controls for at all CCPs and final recycled water quality were consistently compliant with the water quality criteria. The commissioning verification and validation recorded 0 Critical Limit exceedances and demonstrated processes and corrective actions compliance with the WCRWS Validation Program. The commissioning verification and validation has been confirmed as required by the WCRWS Validation Program, the scheme claimed LRVs are tabulated in Table 4 below. As shown, the claim far exceeds the LRV requirement of the approved recycled water supply for electricity generation.

Table 4: Claimed LRV as per WCRWS Validation Program

Critical Treatment Process	Microbial Removal (LRVs)
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	Viruses	Bacteria	Protozoa	Helminths
Total Log Removal	10.5	14.5	10	8
<i>Required Log Removal (augmenting drinking water supplies)</i>	9.5	8	8	8
<i>Required Log Removal for Class A+ (other uses, including electricity generation)</i>	6.5	5	5	5

3.2.2 Assessment against augmentation of a drinking water storage water quality criteria

The RWMP identifies that the criteria for augmenting drinking water supply applies only at the Point of Supply, being at a Lowood Pump Station. No water was supplied through this part of the network during the reporting period. For the purposes of demonstrating the AWTPs can be restarted to produce recycled water that is suitable for augmenting drinking water supply the water produced at the Luggage Point AWTP Point of Supply has been monitored and assessed against the water quality criteria for augmenting drinking water supply.

The methodology for deriving the commissioning verification monitoring program was updated in the amended Validation Program to incorporate the latest research and industry best practice approaches, including the use of chemical indicators, similar to what has been applied by Water Corporation of West Australia for its Perth Groundwater Replenishment Scheme. The methodology is shown in Figure 1.

The monitoring undertaken during the reporting period was planned in early 2018 prior to this methodology being finalised and was based on the methodology in the approved RWMP. Therefore some parameters were not monitored at the required frequency, but is considered sufficient to demonstrate that the AWTPs can be successfully restarted to produce recycled water suitable for augmenting drinking water supply.

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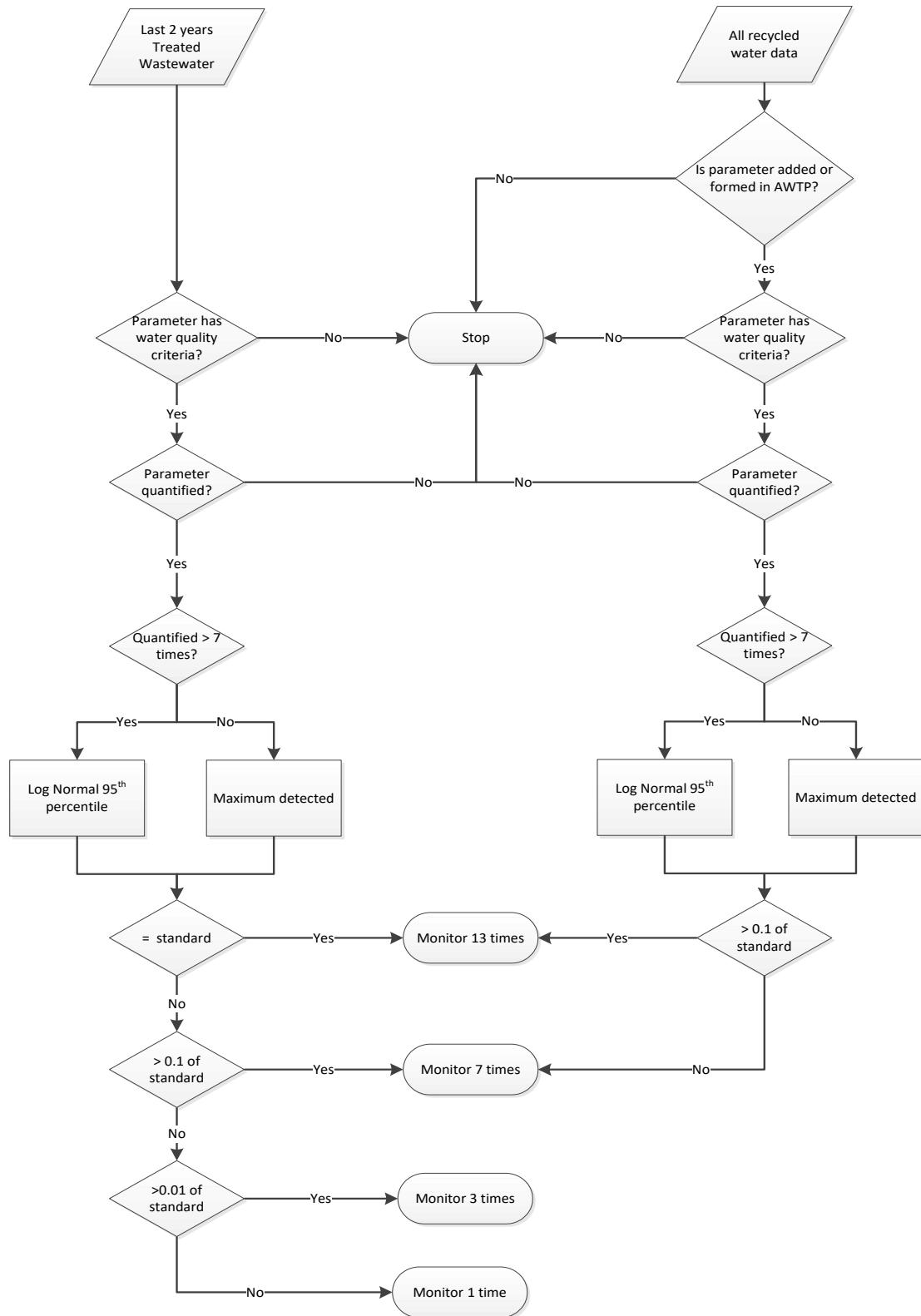


Figure 1 WCRWS Validation Program Monitoring Frequency Determination Flowchart

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The recycled water produced by Luggage Point AWTP and monitored at the Luggage Point AWTP Point of Supply has been assessed against the water quality criteria for the augmentation of drinking water storage end use. The recycled water compliance against the water quality criteria for the augmentation of a drinking water storage has been attached as Appendix A. This monitoring yielded a total of 10,077 individual results against specific health standards in the reporting period. Of these, two parameters were recorded at, or exceeding, their health standard. These exceedances are listed below and described further in Table 5:

- A detection of 1 PFU/100 mL FRNA coliphage was recorded on 24 September 2018 (discussed in Section 3.2.1 in Table 3).
- A series of 16 positive bromate results including a maximum result of 0.024 mg/L were recorded. Bromate has a health standard of 0.020 mg/L and concentration at exceeds this level is not expected in the recycled water. An investigation determined that it was very unlikely that these results were representative of the recycled water quality and is more likely to be from sampling or analytical errors. There is significantly low confidence in these 16 positive detections. As such they will not be included in any long term data assessments and have been excluded from the data used to generate Appendix A.

Table 5: Bromate Detection and Investigation Findings

Parameter	Regulated standard (units)	Measured value	Investigation Details
Bromate	mg/L	0.005 mg/L to 0.024 mg/L In 16 samples between 5 July 2018 and 10 September 2018	<p>The WCRWS is not currently approved for the augmentation of drinking water storage end use, as such regulatory notification against this water quality criteria is not required.</p> <p>Process data was interrogated and investigation of possible bromate formation pathways was undertaken, including:</p> <ul style="list-style-type: none"> • Bromate is a charged molecule similar in both charge and size to sulphate. Sulphate monitoring across the RO indicated that 2 log reduction was achieved over the commissioning verification period and as such about 2 log reduction (99% removal) of bromate would have occurred. To account for the concentrations seen in the PRW about 2 mg/L of bromate would be required in the RO feed, it has not been detected within orders of magnitude of this concentration in the source water data and Urban Utilities have indicated that there are no likely sources at these levels from trade waste. • Bromate may form when bromide mixes with a strong oxidant, such as ozone. However, advanced oxidation occurs via the hydroxyl radical and this pathway does not oxidise bromide to bromate, it also does not form via direct UV oxidation pathways. • Sodium hypochlorite may contain bromate as a by-product of its formation. This occurs if the salt used in the brine solution used to make

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			<p>sodium hypochlorite contains elevated levels of bromide. The chemical supplier has a quality assurance process in place to ensure that the salt contains low levels of bromide, testing of the sodium hypochlorite at the AWTP also confirms that it contains acceptable levels of bromate that could not cause the elevated bromate results observed.</p> <ul style="list-style-type: none"> • Samples were split between three NATA accredited laboratories for bromate analysis. Two laboratories returned results of less than the limit of reporting with the other returning elevated results. This was further discussed with the laboratories and it was concluded that the elevated bromate results are likely to be false positive but it could not be conclusively demonstrated by the laboratory <p>It is concluded from the evaluation of the process and analytical results that bromate is very unlikely to be present or formed in the AWTP process. The most likely cause of these results is sampling or analytical error.</p>
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The commissioning verification and validation undertaken at Luggage Point for Train 1 demonstrated compliant processes and controls for at all CCPs and final recycled water quality were consistently compliant with the water quality criteria. The commissioning verification and validation recorded 0 Critical Limit exceedances and demonstrated processes and corrective actions compliance with the WCRWS Validation Program. The commissioning verification and validation has been confirmed as required by the WCRWS Validation Program, the scheme claimed LRVs are tabulated in Table 4 in Section 3.2.1. As shown, the claim is compliant with the LRV required for the augmentation of a drinking water supply end use.

3.3 Bundamba AWTP supply

The Bundamba AWTP is capable of producing recycled water for supply to the Stanwell Corporation’s Swanbank Power Station and to the other end uses in the Scheme. The Bundamba AWTP was non-operational and did not at any time produce or supply recycled water between 1 July 2018 and 30 June 2019.

3.4 Swanbank Power Station Point of Supply

The recycled water produced at Luggage Point AWTP and supplied to Stanwell Corporations Swanbank Power Station began on 1 July 2018. Between 1 July 2018 and 30 June 2019 (inclusive) the Swanbank Power Station was supplied with 1079 ML of recycled water.

Microbial monitoring was scheduled weekly at the Swanbank Power Station Point of Supply (located at Bundamba AWTP). Sample collection could only occur if the scheduled interval aligned with recycled water being transferred at that time. Of the 52 potential monitoring intervals, the Bundamba Point of Supply was able to have samples collected on 37 intervals. Each of these samples were analysed and yielded non-detect results, with the exception of the results from a single *E. coli* analysis of sample collected on 19 December 2018. This sample could not be analysed as it was affected by a laboratory error. A resample was not able to be undertaken at that time. The monitoring compliance against the Class A+ recycled water criteria is shown below in Table 6.

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Table 6: Bundamba AWTP Point of Supply Class A+ Compliance

Parameter	Regulated standard (units)	Water Quality A+ Criteria	LOR	Maximum	Annual 95% pass Value	No of Results Available
FRNA Coliphages	PFU/100mL	<1 PFU/100 mL in 95% of samples	1	ND	ND	37
Escherichia coli	CFU/100 mL	<1 CFU/100 mL in 95% of samples	1	ND	ND	36
Somatic Coliphages	PFU/100mL	<1 PFU/100 mL in 95% of samples	1	ND	ND	37
Clostridium pefringes	CFU/100 mL	<1 CFU/100 mL in 95% of samples	1	ND	ND	37

Note: Assessment against LRV criteria is not appropriate as this requirement has been met by Luggage Point AWTP and referenced in above in Section 3.2.1.

Two samples collected from the Swanbank Power Station Point of Supply on both 1 August 2018 and 30 May 2019 each recorded non-detect for *E. coli*, FRNA coliphage, somatic coliphage and *Clostridium pefringes*, however the *Clostridium pefringes* was reported with an elevated Limit of Reporting. The Limit of Reporting is typically <1 CFU/100 mL however on these occasions the Limits of Reporting were increased to <10 CFU/100 mL as a result of analytical interference in the samples. This interference is not common and does not indicate contamination nor loss of system control.

3.5 Tarong Power Station Point of Supply at Caboonbah tank

The WCRWS did not at any time supply recycled water to the Stanwell Corporation’s Tarong and Tarong North Power Stations between 1 July 2018 and 30 June 2019. As such no monitoring at this Point of Supply was required.

3.6 Lake Wivenhoe Point of Supply at Lowood Pump Station (augmentation of drinking water storage)

The current RWMP approval permits the supply of recycled water for electricity generation and explicitly prohibits the supply of recycled water from the WCRWS for any higher exposure use. This includes, but is not limited to, the supply of recycled water to Lake Wivenhoe for the augmentation of a drinking water supply. The WCRWS supplied recycled water to the Swanbank Power Station Point of Supply for use at the Stanwell Corporation Swanbank Power station. Recycled water was not supplied to Lake Wivenhoe or further west to the Stanwell Corporation Tarong and Tarong North Point of Supply. As such no PRW was supplied to or beyond the Lake Wivenhoe Point of Supply at Lowood Pump Station and as such no samples were collected from this Point of Supply.

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3.7 Public health risk assessment

The WCRWS was not approved to supply recycled water for the augmentation of a drinking water supply during the reporting period. As such the WCRWS did not supply recycled water for augmentation of drinking water supply and public health risk assessments were not conducted, submitted or required.

4 Reviews

The RWMP was not scheduled for regular review in the reporting period. However, the RWMP is currently under a Scheme Manager initiated review and it is planned to apply to the Regulator to amend the RWMP during the 2019-2020 financial year.

5 Audits

The RWMP was not scheduled for an internal or regular audit in the reporting period.

6 Prescribed incidents

There were no recorded prescribed incidents at the WCRWS in the reporting period.

7 Conclusion

A summary of the activities undertaken in the 2018 to 2019 financial year is listed below:

- The WCRWS was approved for the supply of recycled water for electricity generation for the reporting period.
- The Luggage Point AWTP was available to supply recycled water to meet the Swanbank Power Station demand throughout the reporting period.
- The Luggage Point AWTP provided a cumulative volume of 1079 ML of recycled water to Swanbank Power Station in the reporting period.
- The recycled water produced by the Luggage Point AWTP and supplied through the Swanbank Power Station Point of Supply complied with the water quality standard for Class A+ recycled water.
- The WCRWS was not approved for supply of recycled water for augmentation of drinking water supply and did not undertake this activity.
- The recycled water produced and supplied from Luggage Point AWTP demonstrates the AWTPs of the scheme are capable of producing recycled water that is of a standard suitable to augment drinking water supply.
- There were no RWMP reviews, audits or incidents during the reporting period.
- No membrane units were placed into preservation.
- Seqwater was successful in achieving approval for the amended WCRWS Validation Program.

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Appendix A - Luggage Point AWTP Point of Supply augmentation of drinking water storage compliance table

See REX: D19/175349

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