

Figure 37 WwTP Dissolved Copper, September 2016 – June 2020

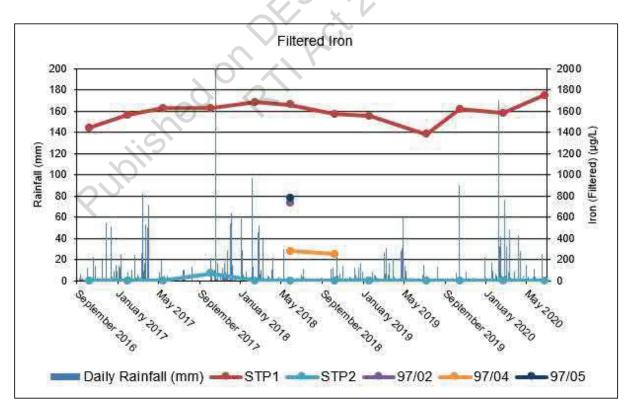


Figure 38 WwTP Filtered Iron, September 2016 – June 2020

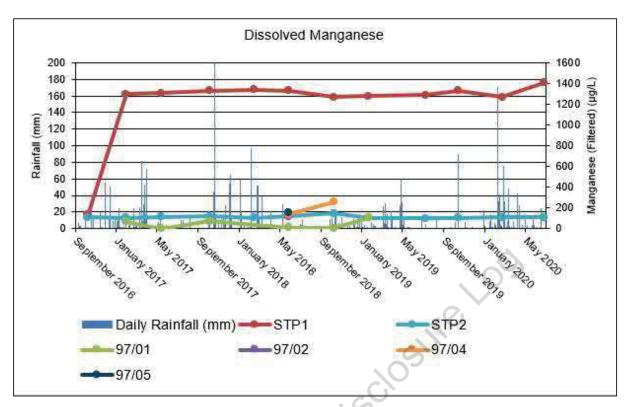


Figure 39 WwTP Dissolved Manganese, September 2016 – June 2020

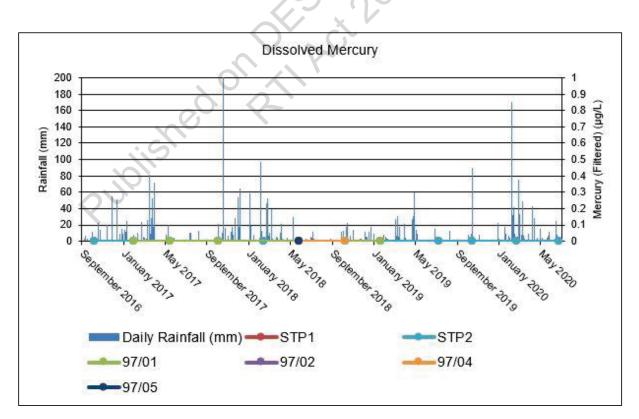


Figure 40 WwTP, Dissolved Mercury, September 2016 – June 2020

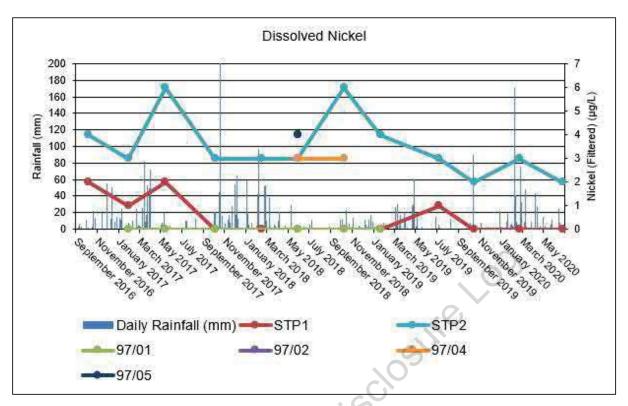


Figure 41 WwTP Dissolved Nickel, September 2016 – June 2020

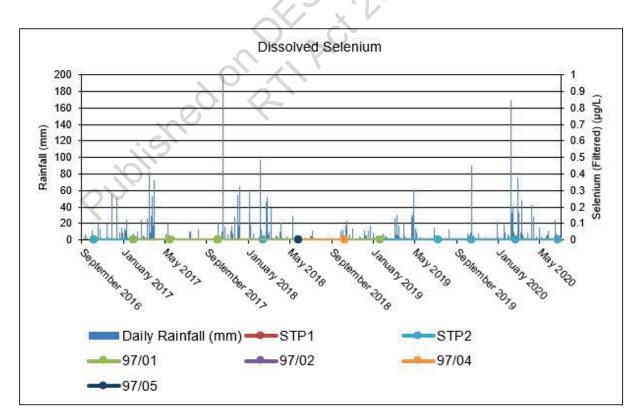


Figure 42 WwTP Dissolved Selenium, September 2016 – June 2020

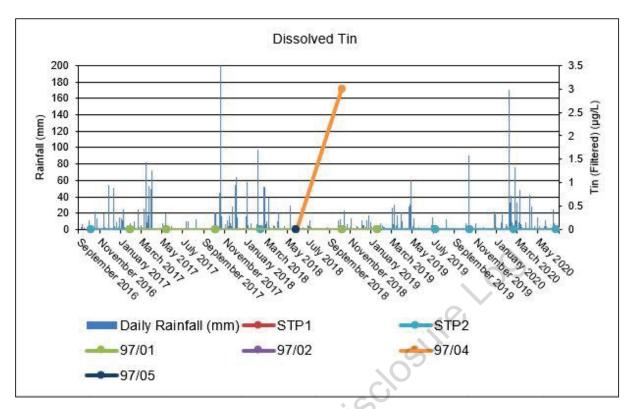


Figure 43 WwTP Dissolved Tin, September 2016 – June 2020

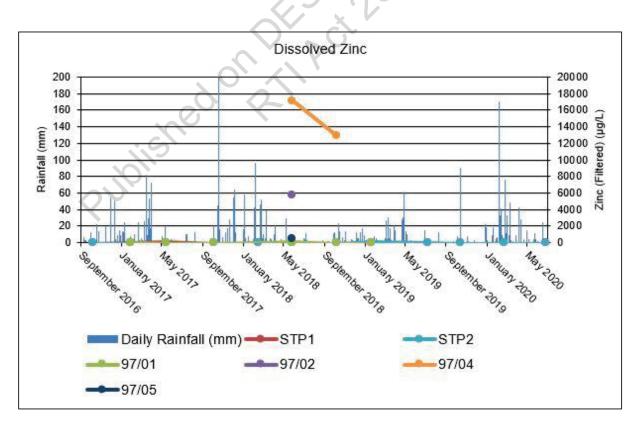


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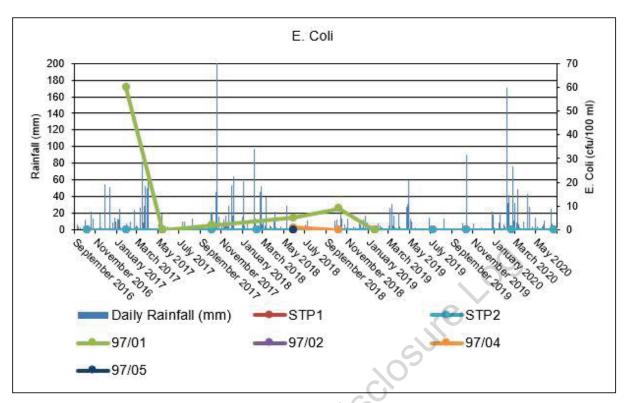


Figure 45 WwTP E.Coli, September 2016 – June 2020

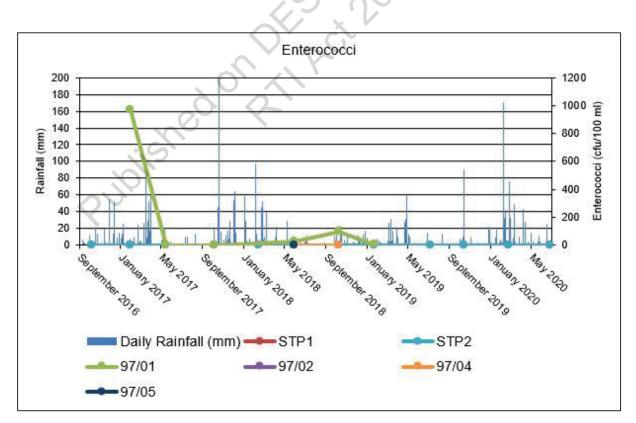


Figure 46 WwTP Enterococci, September 2016 – June 2020



Level 1 / 381 MacArthur Avenue Hamilton QLD 4007 Australia

# APRIL 2021 QUARTERLY REPORT

May 2021 J170932

# Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

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# **Document Control**

Document Quality Management Details.				
Report Name:	April 2021 Quarterly Report			
Site Details:	Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water			
Project Number:	J170932			
Client Name:	Trility Pty Ltd			
Client Number:	C114943			
	Prepared By:	Authorised By:		
Signatures:	sch4p4( 6) Personal information ( 6) Personal info Principal Hydrogeologist	p4( 6) Personal inform 4( 6) Personal inform Practice Manager - Environmental &		
		Contaminated Land Management		

#### **Issue Status**

lssue Status			2
Version No.	Date	Creator	Reviewer
1	31/05/2021	4(6) Personal inform	94(6) Personal inform
Document Circu	ulation	0 P	

### **Document Circulation**

No of Copies	Туре	Customer Name	Position & Company
1	Electronic	6) Personal inf	Senior Administration Officer - Trility





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# **Definitions and Acronyms**

Acronym	Definition
ALS	Australian Laboratory Services
ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
AS/NZS 5667:11	Water Quality Sampling Part 11: Guidance on sampling of groundwaters (1998)
CoC	Chain of Custody
EHP	Department of Environment and Heritage Protection
ERA	Environmentally Relevant Activity
Greencap	Greencap Pty Ltd
IWTP	Integrated Water Treatment Plant
m AHD	metres Australian Height Datum
mg/L	milligrams per litre
ML	Mega Litre
NATA	National Association of Testing Authorities
NEPM	National Environmental Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013
QA/QC	Quality Assurance / Quality Control
RPD	Relative Percent Difference
SWL	Standing Water Level
ТОС	Top of Casing
Trility	Trility Pty Ltd
μS/cm	microsiemens per centimetre
μg/L	mircograms per litre
WwTP	Wastewater Treatment Plant





**Trility Pty Ltd** 

## Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

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# **1** INTRODUCTION

#### 1.1 Background

Greencap Pty Ltd (Greencap) was commissioned by Trility Pty Ltd (Trility) to provide advice regarding the site groundwater conditions and monitoring of groundwater at the Gladstone Regional Council owned and Trility operated Integrated Water Treatment Plant (IWTP) and Wastewater Treatment Plant (WwTP) facilities located in Agnes Water, Queensland (**Table 1-1**).

Location and ERAs of Facilities

Table 1-1

Facility	Environmental Relevant Activity	Location
Integrated Water Treatment Plant (IWTP)	ERA64-(1a) Water Treatment > 0.5 ML but < 5ML water day	Springs Road AGNES WATERS - (Lot 52 Plan SP155903 and Lot 41 Plan SP 206868 ( <b>Figure 2-1)</b>
Wastewater Treatment Plant (WwTP) *	ERA63 (1d) Sewage Treatment >4000 to 10,000EP	Streeter Drive AGNES WATERS (Lot 20 Plan FD991 and Lot 21 Plan SP168519) ( <b>Figure 2-2</b> )

\* It is acknowledged that the treated effluent from the WwTP is irrigated to land as identified in the lot and plan provided above.

The two facilities are administered in accordance with the Department of Environment and Science (DES) Environmental Authority EPPR00959913 (hereafter referred to as the Environmental Authority) issued to Gladstone Regional Council on 1 September 2015, with a revised version issued on 14 May 2020.

In accordance with condition WT7-AW of the Environmental Authority, Greencap was engaged to prepare a Preliminary Groundwater Assessment Report for the IWTP in August 2015 and the WwTP in February 2016. The reports presented an overview of the local geological and hydrogeological conditions; and a number of recommendations identified during the assessment were implemented in September 2016. These included:

#### IWTP

- Prepare and document a groundwater monitoring program for provision to DES for approval, as required by the Environmental Authority EPPR00959913 (the Environmental Authority);
- Install three additional groundwater monitoring wells at the site, in accordance with the Groundwater Monitoring Program; and
- Undertake ongoing groundwater monitoring, in accordance with the Groundwater Monitoring Program.

#### WwTP

- Undertake collar surveys of the existing groundwater monitoring bores so that groundwater level elevations can be determined with reference to the Australian Height Datum (AHD);
- Install two inferred up hydraulic gradient bores to enable monitoring of background groundwater condition;
- Prepare a groundwater management system in accordance with the Environmental Authority conditions that meet the requirements of the Environmental Authority in relation to monitoring groundwater for potential contamination; and
- Undertake the required assessment and reporting of groundwater monitoring results.

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Trility reviewed these reports and implemented the recommendations listed above. Quarterly groundwater monitoring at the IWTP and WwTP commenced in May 2016 and September 2016 respectively. Greencap has been compiling groundwater monitoring data collected by Trility into quarterly and annual reports since this work commenced.

#### 1.2 Objectives and Scope of Work

The overarching objective of the groundwater monitoring for IWTP and WwTP is to monitor for any adverse impacts to groundwater resulting from site operations and ultimately to comply with requirements of the Environmental Authority issued by DES in relation to the monitoring of groundwater for the Gladstone Regional Council owned and Trility operated IWTP and WwTP facilities.

The objective of this quarterly report is to present and summarise the results from the groundwater sampling events undertaken by Trility at the IWTP and WwTP in accordance with Conditions WT8-AW, WT9-AW, WT10-AW and WT11-AW of the Environmental Authority.

The scope of work implemented during the April 2021 quarterly monitoring round included groundwater level gauging and groundwater sampling from existing groundwater bores at both IWTP and WwTP sites. Groundwater gauging was undertaken on a monthly basis in January, February and April (instead of March which was consistent with the previous year monitoring) to infer the direction of groundwater flow, and groundwater sampling occurred in parallel with the April 2021 gauging event.

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# **2** SITE DESCRIPTION

#### 2.1 Integrated Water Treatment Plant

#### 2.1.1 Geology

The IWTP is located at Springs Road, Agnes Water on (Lot 6 on SP150900, Lot 40 Plan SP206868, Lot 52 Plan 155903 and Lot 41 Plan SP206868) and is positioned on the coastal dune system between the Reedy Creek coastal swamp and the Coral Sea (**Figure 2-1**).

The basement rock in the area comprises Lower to Middle Triassic age Agnes Water Volcanics. These volcanic rocks are widespread to the inland of the site and outcrop to the east of IWTP. Overlying the volcanics are Tertiary age Elliot Formation sandstones and alluvial sediments. The Elliot Formation is mapped as outcropping in the elevated areas to the west of Agnes Water.

The Quaternary Age Coastal Dune deposits are a linear sand deposit located immediately adjacent the Coral Sea. These dune deposits reach heights of 50 m AHD in the vicinity of the IWTP. The Reedy Creek swamp area to the west of the IWTP is mapped as consisting of Quaternary age alluvium.

#### 2.1.2 Operations

The IWTP operations are summarised as follows:

- The IWTP extracts raw water from the adjoining Coral Sea via an intake system sited at Chinaman's Beach, and bore water from the Springs Road bores (Figure 3-1);
- Water received at the IWTP is processed via filtration and reverse osmosis systems;
- Water is then chemically dosed to adjust the water properties before distribution to the Gladstone City Council operated potable water network.

The IWTP incorporates the storage and use of chemicals required in the water treatment process. These chemicals are stored under cover in designated chemical storage locations and managed in accordance with the IWTP Environmental Management Plan provisions.

#### 2.1.3 Potential for Leaks

The potential for impacts on groundwater from IWTP activities are generally restricted to:

- Release of chemicals and materials during transfer to and around the treatment facility;
- Loss of integrity of bunding and/or containment systems in chemical storage areas;
- Leakages from transfer systems in the plant operational area;
- Sewage pipe leakages; and
- Brine disposal pipe leakages.

Any releases of chemicals, raw materials and/or process by products have the potential to impact on the existing shallow sand dune aquifer and potentially move west, the inferred groundwater flow direction.

#### 2.2 Wastewater Treatment Plant and Irrigation Area

#### 2.2.1 Geology

The WwTP is located at Streeter Drive, Agnes Water (Lot 21 on SP168519 and Lot 20 on FD991) and is positioned approximately 4.5 km inland to the west of the Coral Sea, south-east of a local topographic feature known as Round Hill, within the Deepwater Creek catchment area (**Figure 2-2**).

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The WwTP is situated within the Lower to Middle Triassic age Agnes Water Volcanics. These rocks commonly outcrop in the elevated landforms surrounding and to the north of the WwTP. In addition, these rocks form coastal headlands to the east of the WwTP.

Overlying the volcanics in the WwTP area are Quaternary age alluvium and colluvium.

#### 2.2.2 Operations

The operations of the wastewater treatment plant on site are summarised as follows:

- Sewage from Agnes Water township is pumped to the site via a number of designated pumping stations at a volume of no more than 10,000 equivalent persons (EPs);
- Sewage undergoes tertiary treatment (to class B standard) on site through aerobic digestion;
- Following tertiary treatment, treated effluent is retained in a series of specially constructed lagoons; and
- Treated effluent is discharged via irrigation to the designated irrigation area (Figure 3-2).

#### 2.2.3 Potential for Leaks

The potential for impacts on groundwater from WwTP activities is generally restricted to:

- Release of chemicals and materials during transfer to and around the treatment facility;
- Loss of integrity from bunding and/or containment systems in chemical storage areas;
- Leakages from transfer systems in the plant operational area;
- Sewage pipe leakages; and
- Leaks from the liner of the treated effluent ponds.

Any leaks of chemicals and/or contaminants arising from the operation have the potential to impact the aquifer in the Agnes Water Volcanics and shallow alluvial material at the WwTP site.

Within the irrigation area, both the shallow local alluvial aquifer and the deeper Agnes Water Volcanics may be present. In both areas, groundwater flow direction inferred to be generally in a southern direction and hence have the potential to be impacted upon by any chemical and/or contaminant releases.

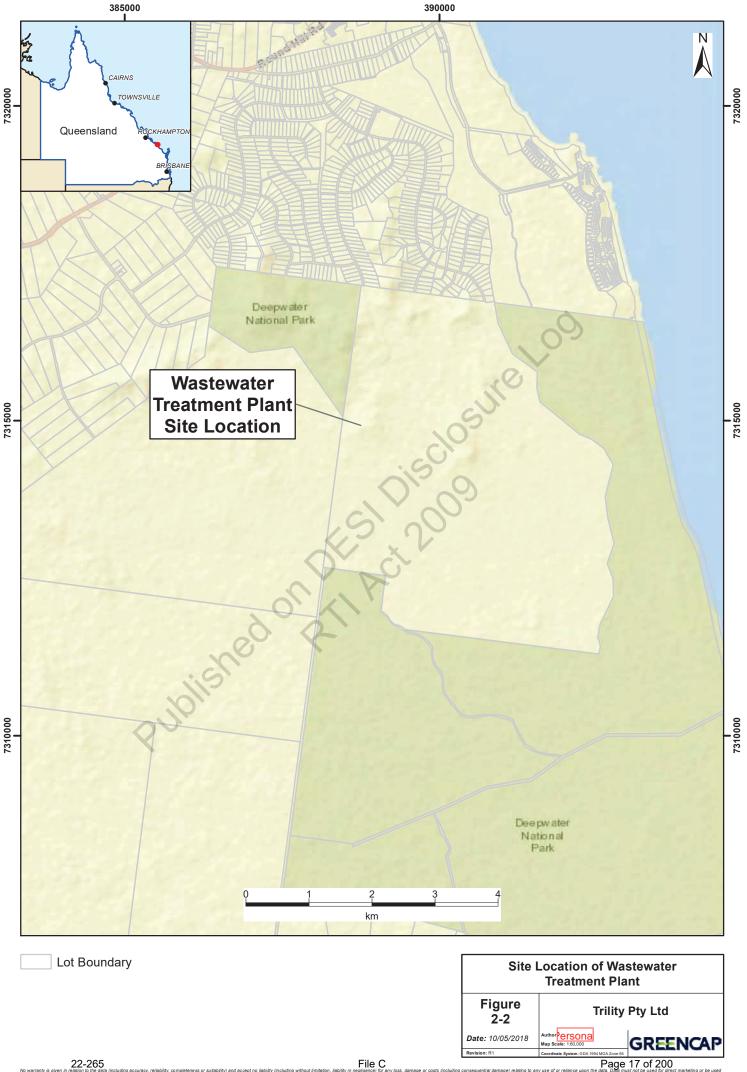
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## **3 GROUNDWATER BORE MONITORING NETWORK**

#### 3.1 Integrated Water Treatment Plant

Greencap attended the IWTP on 23 May 2016 to supervise the installation of three groundwater monitoring bores in accordance with condition WT22-AWDP of the EA. A surveyor was engaged to provide the coordinates for each monitoring bore and to determine the relative elevation levels.

**Table 3-1** summarises the details of the IWTP groundwater monitoring bores. The locations of the IWTP groundwater bores are shown in **Figure 3-1**.

Easting	Northing	Depth of Well (mbGL) <sup>1</sup>	Relative Level (m)
390050.613	7320897.615	6.5	19.117
390045.732	7320949.351	6.0	19.555
390005.808	7320906.402	5.0	18.739
	390050.613 390045.732	390050.613         7320897.615           390045.732         7320949.351	Easting         Northing         Well (mbGL) <sup>1</sup> 390050.613         7320897.615         6.5           390045.732         7320949.351         6.0

Table 3-1	Integrated Water Treatment Plant Groundwater Monitoring Bores	

<sup>1</sup> metres below ground level

#### 3.2 Wastewater Treatment Plant and Irrigation Area

The groundwater monitoring bore network (MP97/01 to MP97/05, MP00/07 and MP00/08) was constructed at the WwTP prior to 2008 and the management of the facility by Trility. Monitoring of water quality from the supply pipe and from the existing bores commenced in September 2008 and has been ongoing on a regular basis.

On 25 May 2016 Greencap inspected all the existing bores and identified that they appeared to be shallow but in good working condition and suitable for monitoring purposes if groundwater is present. At this time Greencap also supervised the installation of two additional groundwater monitoring bores at the WwTP, identified as STP1 and STP2, for the purposes of obtaining information on the background groundwater quality in the area to be able to identify wastewater impacts (if any) via comparison with background groundwater quality. A surveyor was engaged to provide the coordinates for all existing and newly installed monitoring bores at the WwTP and to determine the levels relative to AHD.

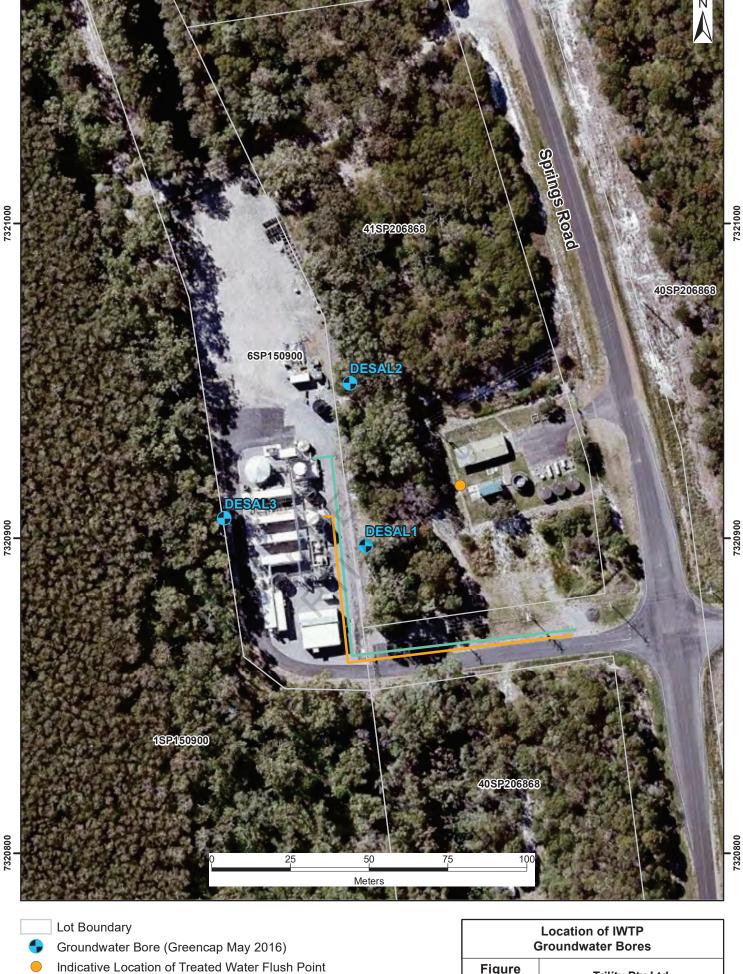
**Table 3-2** summaries the details of the WwTP groundwater monitoring bores. The locations of the WwTP groundwater bores are shown in **Figure 3-2**.



#### Table 3-2

#### Wastewater Treatment Plant Groundwater Monitoring Bores

Well Name	Easting	Northing	Depth of Well (mbTOC) <sup>1</sup>	Relative Level
STP1	388929.148	7315839.541	15.36	31.081
STP2	389440.292	7314580.914	13.14	10.880
MP97/01	388501.285	7315186.657	1.10	19.938
MP97/02	388820.691	7313990.578	1.70	9.422
MP97/03	389158.188	7313938.606	1.69	8.479
MP97/04	389280.803	7313491.850	1.57	7.130
MP97/05	388379.765	7312693.071	1.02	6.074
MP00/07	388376.341	7314916.325	1.80	15.835
MP00/08	388215.935	7314808.284	1.785	14.120
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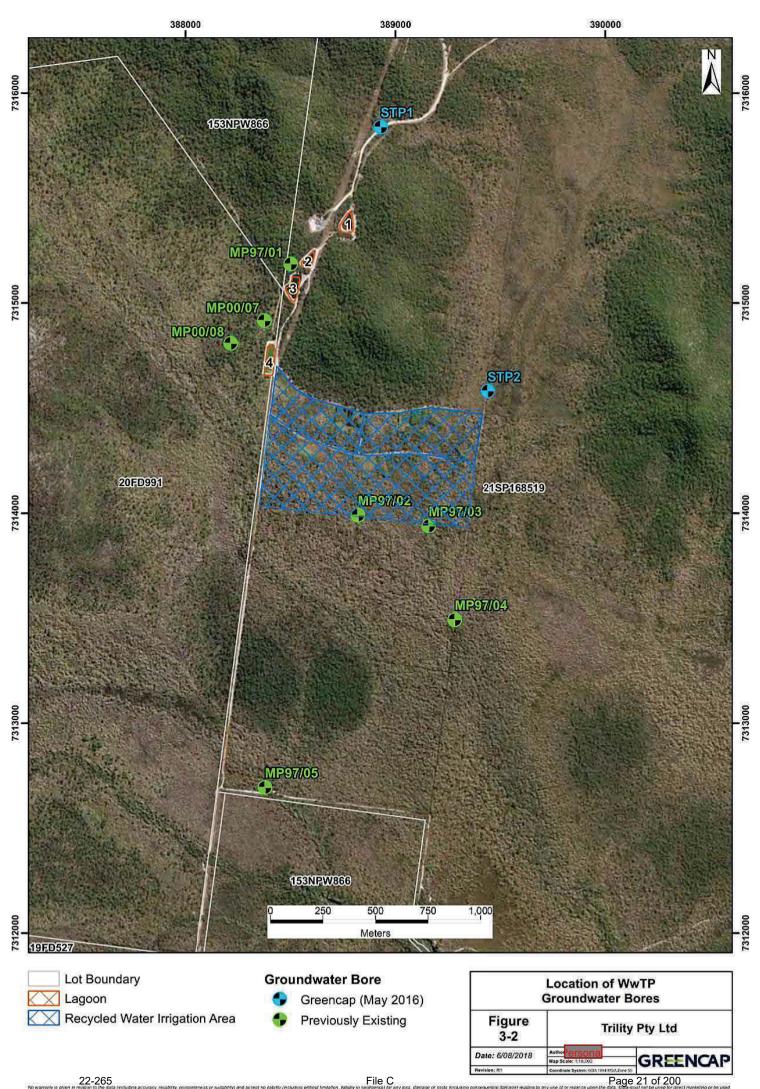
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# 4 MONITORING PARAMETERS AND TRIGGER VALUES

The Environmental Authority for the WwTP sets out the list of parameters required to be monitored as part of the regular groundwater monitoring program, as well as the associated trigger values. These are summarised in **Table 4-1**.

Quality Characteristic	Units	Trigger Values	
Dissolved Oxygen	mg/L		
Total Nitrogen	mg/L as Nitrogen		
Nitrate	mg/L as Nitrogen	<b>A</b>	
Ammonia	mg/L as Nitrogen	20% change from background <sup>1</sup>	
Total Phosphorous	mg/L		
Chloride	mg/L		
Conductivity	uS/cm		
Sulphate	mg/L	No change from background <sup>2</sup>	
Boron	mg/L		
рН	pH unit		
Faecal Coliforms	Colony forming units/100ml	buckground	
Enterococcus Organisms	Colony forming units/100ml		
Total Metals: (Al, Fe, Mn, As, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Sn, Zn).	mg/L or ug/L		
Dissolved Metals: (Al, Fe, Mn, As, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Sn, Zn).	mg/L or ug/L	Within ANZECC Guidelines	

#### Table 4-1 Monitoring Parameters and Trigger Values

<sup>1</sup>Trigger values are defined as an upper limit (20% increase from background) with the exception of dissolved oxygen, which is defined as a lower limit (20% decrease from background).

 $^{2}$  Trigger values are defined as an upper limit – an exceedance is any increase from the background value, with the exception of pH which is defined as any change up or down from the background value.

Due to the absence of a background level defined by Environmental Authority and/or suitable baseline groundwater data for the area, the background value for the purposes of the trigger values have been considered to be the results from the first sampling event conducted for each of the bores included in the Groundwater Monitoring Program.

Trigger values for total and dissolved metals are detailed in the Agnes Water Groundwater Management System and are in accordance with *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council [ANZECC] and the Agriculture and Resource Management Council of Australia and New Zealand [ARMCANZ], 2000a) (ANZECC Guidelines).

The Environmental Authority for the IWTP does not specify any particular requirements for groundwater monitoring parameters nor trigger values. On this basis, the groundwater monitoring parameters and trigger values set out in **Table 4-1** have also been adopted for the IWTP.





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Groundwater sampling was undertaken by Trility in accordance with industry standards including AS/NZS 5667.11:1998 *Water Quality Sampling – Guidance on sampling of groundwater* (AS/NZS 5667.11).

Sampling was undertaken using low-flow sampling techniques to obtain samples representative of groundwater within the aquifer. This technique is preferred by *National Environmental Protection* (Assessment of Site Contamination) Measure 1999, as amended May 2013 (NEPM [2013]).

Prior to the sampling, the standing water levels (SWL) were measured from the top of each bore casing (TOC).

Groundwater bores were purged using a peristaltic pump and sampled via dedicated low-density polyethylene tubing at each location. During purging, groundwater level measurements were recorded to confirm that drawdown within the bores stabilised.

Groundwater field parameters including pH, temperature, electrical conductivity (EC), salinity, dissolved oxygen (DO), and oxidation reduction potential (ORP), were measured and recorded continually during the purging process using a YSI Professional Plus multi-parameter water quality meter fitted with a flow-through cell. The samples were collected when the field parameters stabilised. The groundwater field sampling records provided by Trility are presented in **Appendix A**.

It is understood that decontamination of non-dedicated sampling equipment between each sampled bore was undertaken using a phosphate-free detergent and rinsed with laboratory grade deionised water between sampling locations, in accordance with AS/NZS 5667:11.

Samples used for dissolved analytes were filtered in the field using a 0.45  $\mu$ m filter and placed in the appropriately preserved sample bottles provided by the testing laboratory as required for individual analyses.

Samples were stored in a chilled portable cooler immediately after collection and were delivered under similar conditions to the analytical laboratories with accompanying chain of custody (COC) documentation.

The laboratory used for the program was Australian Laboratory Services Pty Ltd (ALS), a laboratory accredited by the National Association of Testing Authorities (NATA) with analysis of the samples being conducted under NATA approved methodologies as required under condition G15-AW (b) of the Environmental Authority.





Groundwater samples for the first quarter of 2021 were collected between the 19<sup>th</sup> and 22<sup>nd</sup> of April 2021, results for this period are presented below. A summary of the analytical results is provided in **Appendix B** and discussed in the sections below. Laboratory certificates and chain of custody (COC) documentation provided by Trility are attached in **Appendix C**.

#### 6.1 Rainfall

The total rainfall recorded at the WwTP was 609.8 mm and 530.5 mm at the IWTP for the monitoring period (**Table 6-1**). This was lower than the rainfall recorded for the same period in 2020 which had 669.65 mm and 666.7 mm of rainfall at the WwTP and IWTP respectively.

	Table 6-1 Rainfall I	Rainfall Data, January - April 2021				
Month	WwTP					
January 2021	67.1		60.1			
February 2021	83		71.6			
March 2021	350.3	5	293.8			
April 2021	109.4		105			
Total	609.8	is	530.5			

#### 6.2 Field Observations

Groundwater level gauging was conducted at the WwTP and IWTP bores in January, February and April 2021 (**Table 6-2**). Physical aspects of groundwater quality including colour, and odour noted during sampling are summarised in **Table 6-3**.

The inferred groundwater flow direction for each month for IWTP and WwTP are presented in **Figure 6-1** to **Figure 6-6**.

#### Table 6-2 Groundwater Gauging Data, January – April 2021

Monitoring	Relative Height Data		Groundwater fr Casing (m bTOC	-	f Groundwater Elevation (m AHD) <sup>2</sup>			
Location	(m AHD)	January	February	April	January	February	April	
		2021	2021	2021	2021	2021	2021	
WwTP								
STP1	31.081	2.684	2.72	2.615	28.397	28.361	28.466	
STP2	10.880	4.697	4.665	4.42	6.183	6.215	6.460	
MP97/01	19.938	1.227	0.908	0.51	18.711	19.030	19.428	
MP97/02	9.422	DRY	DRY	1.275	DRY	DRY	8.147	
MP97/03	8.479	1.348	1.346	0.82	7.131	7.133	7.659	
MP97/04	7.130	1.11	1.108	0.65	6.020	6.022	6.480	
MP97/05	6.074	0.754	0.74	0.512	5.320	5.334	5.562	
MP00/07	15.835	DRY	DRY	1.36	DRY	DRY	14.475	
MP00/08	14.120	DRY	DRY	1.035	DRY	DRY	13.085	

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Monitoring	Relative Height Data	Depth to Groundwater from Top of Casing (m bTOC) <sup>1</sup> January February April 2021 2021 2021			Groundwater Elevation (m AHD) <sup>2</sup>		
Location	(m AHD)				January 2021	February 2021	April 2021
IWTP							
DESAL1	19.117	2.678	2.798	2.45	16.439	16.319	16.667
DESAL2	19.555	3.027	3.12	2.72	16.528	16.435	16.835
DESAL3	18.739	3.285	3.38	3.04	15.454	15.359	15.699

<sup>1</sup> m bTOC = metres below top of casing

<sup>2</sup> m AHD = metres Australian Height Datum

DRY = no standing water present



Table 6-3	Groundwater Field Description, April 2021
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Monitoring Location	Colours	Odour	Turbidity
WwTP		Ś	
STP1	Clear	No odour	ND <sup>1</sup>
STP2	No colour	No odour	No visible turbidity
MP97/01	No colour	No odour	Turbid
MP97/02	No colour	ND <sup>1</sup>	Turbid
MP97/03	Colour	ND <sup>1</sup>	Turbid
MP97/04	ND <sup>1</sup>	ND <sup>1</sup>	Turbid
MP97/05	ND <sup>1</sup>	ND <sup>1</sup>	Turbid
MP00/07	No colour	ND <sup>1</sup>	Turbid
MP00/08	No colour	ND <sup>1</sup>	Turbid
IWTP	Ner K		
DESAL1	Colour	Slight odour	Not turbid
DESAL2	Colour	No odour	Slightly turbid
DESAL3	Slight colour	Slight odour	$ND^1$

<sup>1</sup>ND = no data



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GISVAgnes Water J158043-01 Sept 2018\_QRvnxdFIG\_6\_4 (WTP\_GW\_Level\_10\_2018\_190115.mxd

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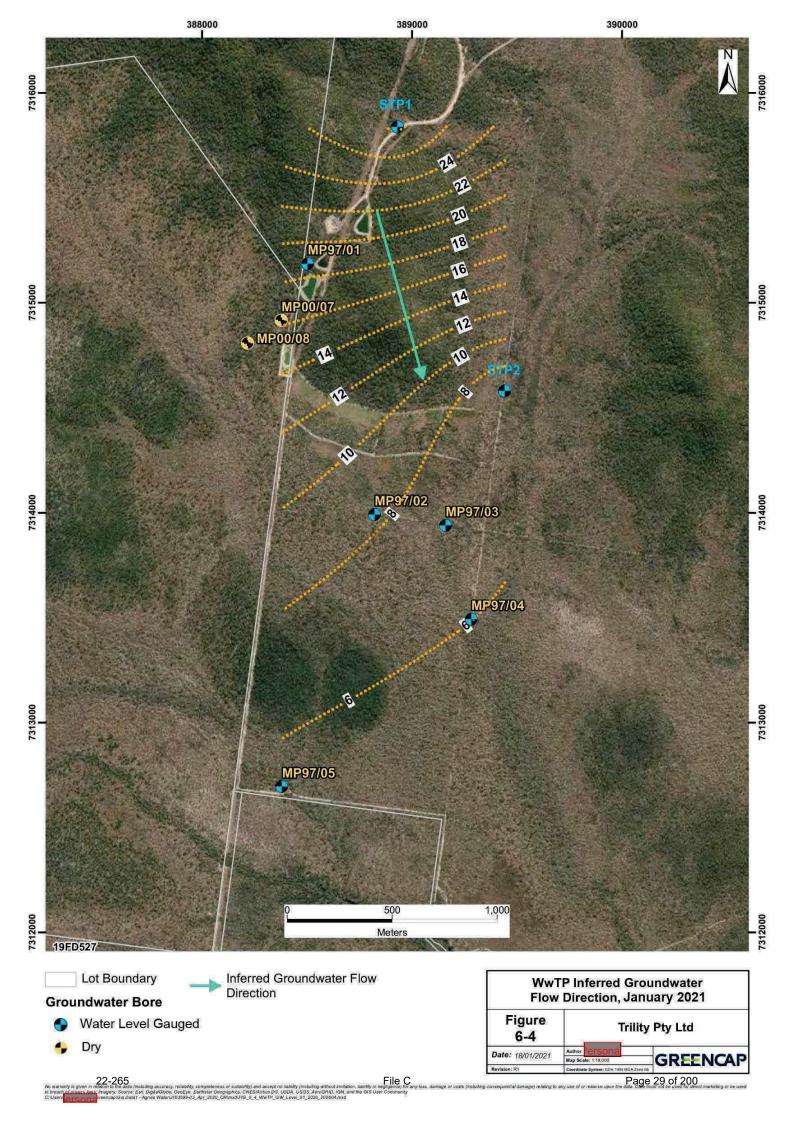
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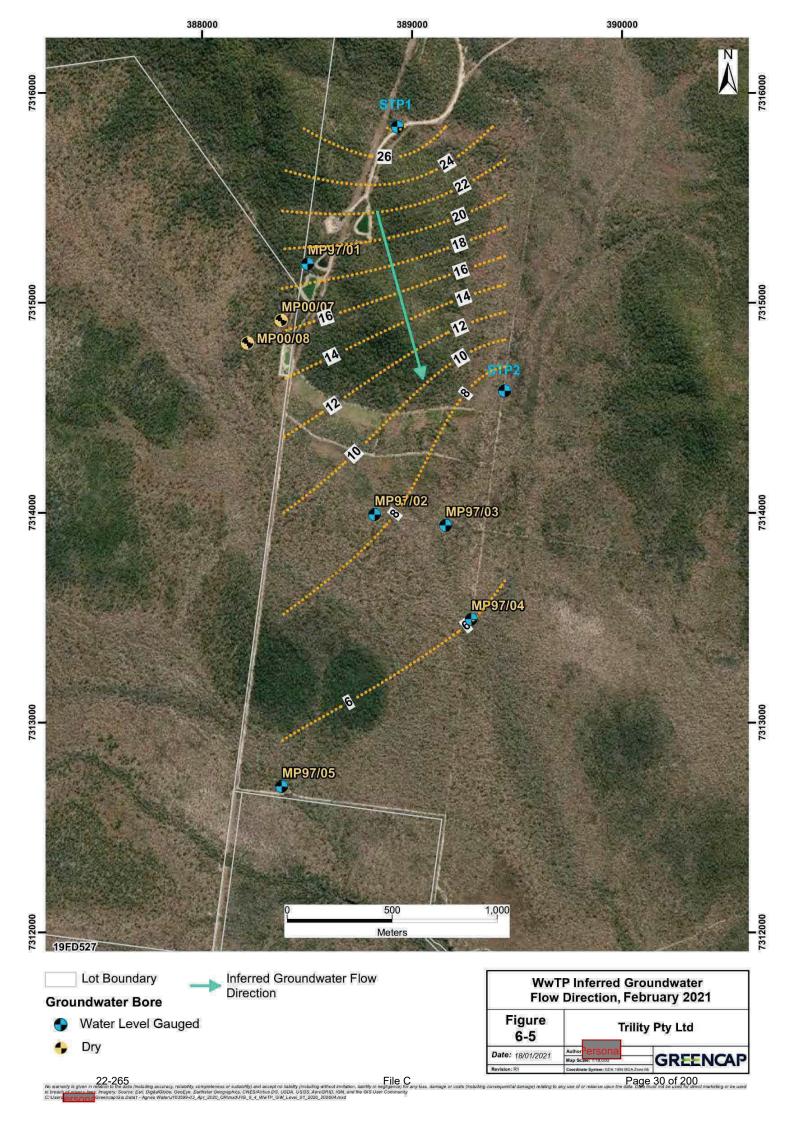
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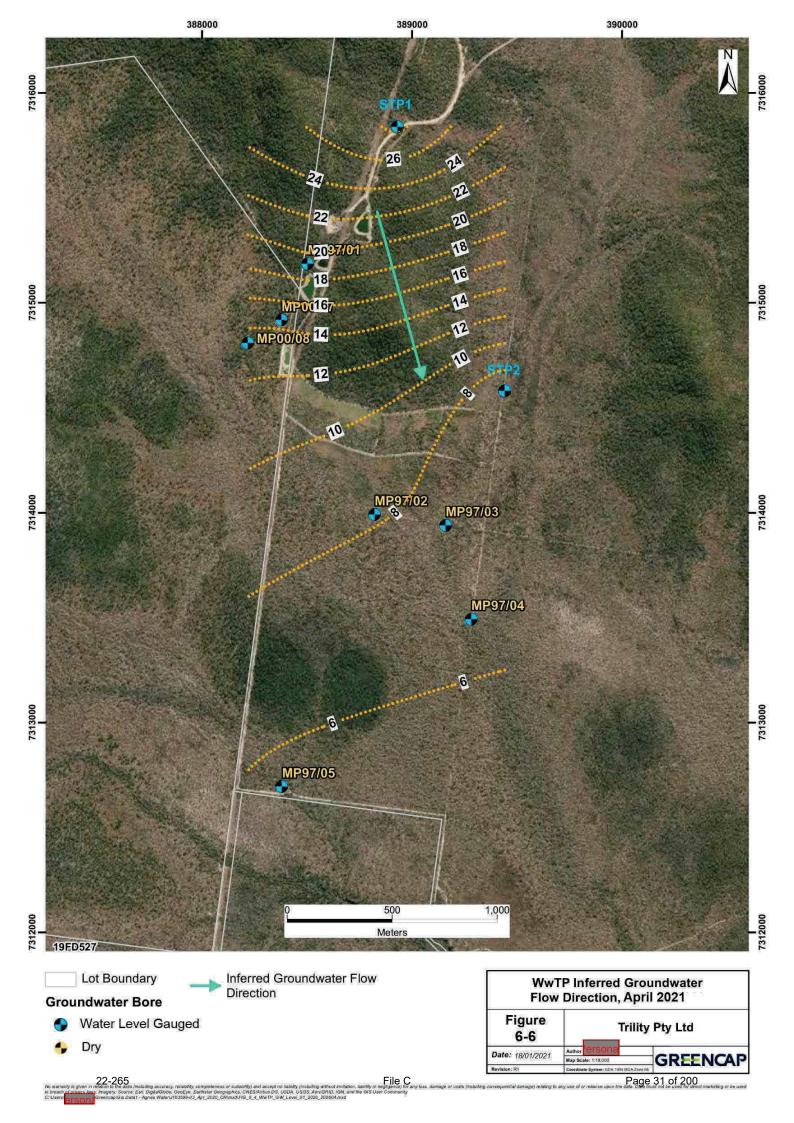
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#### 6.3 Field Measurements

Physio-chemical water quality parameters were monitored in groundwater bores during purging and prior to sampling. Parameters measured were pH, electrical conductivity (EC), dissolved oxygen (DO), temperature and oxidation reduction potential (ORP). Samples were only collected from STP1, STP2, MP97/01, DESAL1, DESAL2 and DESAL3. Other bores were found to have an insufficient water volume for sample collection. The parameters are summarised in **Table 6-4**, shaded cells indicate exceedances of the adopted criteria, i.e. background readings.

Table 6-4	Field Measured Water Quality Parameters, TV Comparison, April 2021					
Monitoring locations	Date	DO <sup>1</sup> (mg/L)	EC <sup>1</sup> (μS/cm)	pH <sup>2</sup> (pH Units)	ORP <sup>3</sup> (mV)	Temperature <sup>3</sup> (°C)
WwTP						
STP1 (background)	Sep-2016	2.78	3,812	6.67	N/A	N/A
STP1	Apr-2021	0.28	3,778	6.56	6.2	24.1
STP2 (background)	Sep-2016	3.72	11,908	6.50	N/A	N/A
STP2	Apr-2021	0.49	11,732	6.38	68.5	24.1
97-01 (background)	Dec-2016	1.45	670	6.24	N/A	N/A
97-01	Apr-2021	2.48	377	5.75	133	21.8
IWTP				0		
DESAL1 (background)	Sep-2016	1.35	118	4.31	N/A	N/A
DESAL1	Apr-2021	0.13	453	4.10	-19.9	25.9
DESAL2 (background)	Sep-2016	0.06	137.4	2.27	N/A	N/A
DESAL2	Apr-2021	0.25	199	4.09	114	24.5
DESAL3 (background)	Sep-2016	1.26	172	5.36	N/A	N/A
DESAL3	Apr-2021	1.75	1,772	4.55	-134	27.2

#### Table 6-4 Field Measured Water Quality Parameters, TV Comparison, April 2021

<sup>1</sup>The criteria for dissolved oxygen exceedance is a 20% reduction from the background value

<sup>2</sup> The criteria for pH exceedance is any change up or down from the background-derived trigger value

<sup>3</sup> No associated trigger value

These results indicate that the groundwater within the WwTP bores is slightly acidic and acidic within the IWTP bores. This is consistent with previous quarterly results. The dissolved oxygen is low, which is expected in groundwater aquifers. The salinity of the IWTP groundwater is indicative of fresh water, whilst the salinity of the WwTP is highly variable and trending towards saline.

#### 6.4 Laboratory Results

Laboratory results for the WwTP and IWTP bores were compared against the adopted trigger values (**Table 4-1**). A Summary is provided below.

It is important to distinguish the results for the background bores installed at both WwTP and IWTP to assess natural variation of chemical concentrations in the incoming groundwater (refer groundwater flow directions shown on Figure 6-1 through to Figure 6-6). Groundwater at these bores cannot be impacted as a result of the site activities. Such bores are:

- STP1 and STP2 at WwTP; and
- DESAL1 and DESAL2 at IWTP.





As the Environmental Authority does not differentiate between background and downgradient bores the April 2021 results were compared with trigger values for both types of bores.

The exceedances are summarised in **Table 6-5** and **Appendix B** presents a summary of all reported results and exceedances.

	Table 6-5	Groundwater Trigger Value Exceedances, April 2021					
Parameter	Triccor Makes	Bores Exceedin	g Trigger Value	Exceedance Value, mg/L or μg/L (%)			
Parameter	Trigger Value	Background	Downgradient	Background	Downgradient		
WwTP							
Ammonia	20% change from background	STP1	97-01	0.17 (1,600)	0.52 (2,500)		
Nitrate	20% change from background	STP 2	-	0.07 (600)	-		
Total Nitrogen	20% change from background	STP1	97-01	0.2 (100)	0.8 (30)		
Total Aluminium	55 μg/L	-	97-01	<u> </u>	1,090		
Dissolved Aluminium	55 μg/L	-	97-01	-	1,540		
Total Cobalt	1.0 μg/L	STP2		2	-		
Dissolved Cobalt	1.0 μg/L	STP2		2	-		
IWTP		, C					
Ammonia	20% change from background	DESAL1, DESAL2	DESAL3	0.05 – 0.08 (400 – 700)	1.64 (16,300)		
Chloride	20% change from background	DESAL1, DESAL2	DESAL3	43 – 116 (38 – 380)	545 (2,200)		
Nitrate	20% change from background	DESAL2	-	0.39 (160)	-		
Total Nitrogen	20% change from background	DESAL1	DESAL3	2.2 (100)	2.1 (50)		
Aluminium (total)	55 μg/L	DESAL1, DESAL2	DESAL3	400 - 1,020	300		
Dissolved Aluminium	55 μg/L	DESAL1, DESAL2	DESAL3	360 - 1,040	300		
Total Copper	1.4 μg/L	DESAL1	-	2	-		

From Table 6-5 it is noted that trigger value exceedances were calculated for both background and downgradient monitoring bores indicating that variations in groundwater chemistry cannot be solely attributed to the impacts associated with activities at IWTP and WwTP.



# 7 QUALITY ASSURANCE AND QUALITY CONTROL

#### 7.1 Field QA/QC Data

Only intra-laboratory duplicates were collected during groundwater sampling round in April 2021. The majority of the calculated relative percent differences (RPD) between primary and duplicate samples were within the adopted acceptance criteria of 50% (Australian Standard AS4482.1-2005 *Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds*). The RPD calculations are included in the attached summary tables in **Appendix B**.

This was with the exceptions of ammonia at WwTP duplicate with the calculated RPD exceeded the adopted threshold. The reason cannot be assessed, however the concentration of ammonia reported in the duplicate was lower than in the primary sample and therefore this RPD exceedance does not impact the reporting outcomes.

It should be noted, however, that in accordance with environmental standards field QA/QC samples should also include:

- Field rinsate sample (assesses effectiveness of sampling equipment decontamination procedures);
- Field blank sample (assesses potential for sample contamination during sampling);
- Trip blank sample (assesses for contamination during transportation); and
- Inter-laboratory sample (triplicate assesses reproducibility of results through a second NATAaccredited laboratory).

Inclusion of these QA samples will assist in identifying potential sources of errors (if any) that may influence the quality of samples during the sampling, sample transportation and equipment decontamination.

#### 7.2 Laboratory QA/QC Data

A summary of laboratory quality assurance and quality control (QA/QC) data is presented in Table 7-1.

Table 7-1	Laboratory QA/QC data
-----------	-----------------------

Report #	Analysis Within Holding Time	Lab. Duplicate RPD %	Lab Matrix Spike Recovery	Lab. Control Sample	Lab Method Blank		
EB2111143 (IWTP)	SP	Р	Р	Р	Р		
EB2110810 (WwTP)	Р	Р	Р	Р	Р		
P = Pass X = Fail	- = not required	* = refer to report tex	xt				
Quality Assurance Cr	iteria	Quality Control Criteria					
Holding Times		Accuracy					
Volatile Organic Carb and water		Matrix spike, control sample: 70-130%, depending on analyte. Surrogate recovery: 50-150%, depending on analyte.					
Semi Volatile Organic water, 14 days soil	c Carbons 7 days	ys Precision					
Metals 6 months, Me	ercury 28 days	Method Blank: Not detected Duplicate: No limit (<10xLOR), 0-50% (10-20xLOR), 0-20% (>20xLOR)					

As shown in Table 7-1 no issues for laboratory quality control breaches were identified for April 2021 event.

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## 8 **DISCUSSION**

The following sections discuss the results of the April 2021 groundwater sampling event, with reference to previous events.

It is important to note that the exceedances for most parameters, with the exception of metals, reported in quarterly reports and in **Section 6** of this report were based on comparison with the results of the initial groundwater monitoring undertaken in September 2016. The result from this single round have been used to develop a set of trigger levels as discussed in **Section 4**.

Aside from trigger values developed based on the initial groundwater monitoring event, concentrations of metals were also compared against water quality criteria specified by ANZECC Guidelines. Although some exceedances were noted against these criteria, the reported concentrations of metals are likely to be naturally elevated, as there is no consistency in up-gradient vs down-gradient concentrations recorded to indicate impacts from site activities. Also, variations in metal concentrations are evident in some bores in which concentrations periodically decrease to be below the ANZECC criteria. Such variations may be seasonal and should be further assessed.

The section below summarises the groundwater results and discusses potential causes for the changes in reported concentrations of chemicals of concern and other water quality parameters.

A summary of sampling results is presented in **Appendix B**.

#### 8.1 IWTP

The groundwater level contour pattern was consistent with previous monitoring periods, with inferred groundwater flow west-southwest from DESAL1 and DESAL2 (background bores) towards DESAL3.

Groundwater results for DESAL bores within the IWTP (DESAL1, DESAL2, and DESAL3) in April 2021 were similar compared with previous results. Some observations were made and are discussed as follows:

- Groundwater salinity (expressed as EC) at IWTP background bores was generally within the previously reported ranges. However, a higher salinity value was measured in the downgradient bore which may be indicative of site-related impact. Results from subsequent monitoring will be used to verify this increase.
- Dissolved oxygen levels measured during sampling in all three bores (DESAL1 to DESAL3) were relatively low. Low dissolved oxygen is typical for groundwater environments due to the lack of groundwater exposure to atmospheric air.
- The overall pH values in all three bores were indicative of acidic conditions with the most acidic pH values recorded in DESAL1 and DESAL2, up-hydraulic gradient of the IWTP. This may be representative of the local groundwater conditions due to the overall general consistency in the pH values over the duration of monitoring, and the most-acidic bore being up-hydraulic gradient of the IWTP.
- Trigger value exceedances in all three IWTP bores (potentially indicative of seasonal variations) were noted for ammonia, chloride and total and dissolved aluminium. Exceedances in the background bores DESA1 and DESAL2 were noted for nitrate and total copper likely related to seasonal variations. No exceedances were noted in the downgradient DESAL3 bore.
- Microbiological parameters (*E. Coli* and Enterococci) were below the limit of reporting in all three IWTP bores.

#### 8.2 WwTP

One downgradient bore (97/01) and two background bores (STP1 and STP2) were sampled in April 2021. Other downgradient bores (97/02, 97/03, 97/04, 97/05, 00/07 and 00/08) did not contain sufficient volume of groundwater to fill the required sampling containers.



The sampling results are discussed below:

- The exceedances of field parameters such as dissolved oxygen and pH were reported for both background, STP1 and STP2 bores and the downgradient bore 97/01 indicating seasonal variations.
- Exceedances in the background (SPT1 and/or SPT2) bores and in the downgradient bore for ammonia and total nitrogen are potentially indicative of seasonal variation.
- Exceedances in the background bores only were noted for nitrate and total and dissolved cobalt indicating that these exceedances are likely a result of seasonal variations.
- Exceedances in the downgradient bore only were noted for EC and total and dissolved aluminium. The level of EC and concentration of total aluminium was within the previously reported ranges, but the concentration of dissolved aluminium was significantly higher compared to previous results and compared to background levels. The high level of dissolved aluminium may be a result of insufficient filtering and may be attributable to entrained sediments captured in the sample. This will be verified during subsequent monitoring events.
- E. Coli and Enterococci results were below the limit of reporting in the background bores, however, a presence was reported in the downgradient bore which may be a result of the site impact. The presence of *E. Coli* and Enterococci was reported in the downgradient bore previously including the initial sampling round in 2016.

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#### 9 **SUMMARY & CONCLUSIONS**

Sampling was undertaken at both IWTP and WwTP bores in April 2021. The groundwater hydraulic gradient and direction at both sites were consistent with historical observations.

### **IWTP**

For the IWTP, all three bores (DESAL1, DESAL2, and DESAL3) were sampled. Exceedances against adopted trigger values were noted for:

Up gradient (background) bores only – seasonal variations

- Dissolved Oxygen;
- Nitrate; and
- Total Copper.

osureLor Both down and up gradient bores – potentially seasonal variations

- pH;
- Electrical conductivity;
- Ammonia;
- Chloride;
- Total Nitrogen; and
- Dissolved and total aluminium.

Downgradient bore only – potential impacts from site activities

• No impacts were reported.

Groundwater results for DESAL1, DESAL2 and DESAL3 were generally consistent with results from previous quarterly monitoring rounds.

### **WwTP**

For the WwTP, both background bores (STP1 and STP2) and one downgradient bore (97-01) were sampled in April 2021. Other downgradient bores (97/02, 97/03, 97/04, 97/05, 00/07 and 00/08) were purged but not sampled due to very limited volume of groundwater in these bores.

Exceedances against adopted trigger values were noted for:

Up gradient (background) bores only – seasonal variations

- Nitrate; and
- Total and dissolved Cobalt.

Both down and up gradient bores - potentially seasonal variations

- Dissolved Oxygen;
- pH; •
- Ammonia; and
- Total Nitrogen

### Downgradient bore only – potential impacts from site activities

- Electrical Conductivity;
- E. Coli and Enterococci; and
- Dissolved and total aluminium.

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Groundwater results for the sampled bores were generally consistent with results from previous quarterly monitoring rounds.

### Recommendations

The following recommendations are made:

- Field QA/QC samples should be expanded to include inter-laboratory duplicates and blanks to assist in identifying potential sources of errors that may influence the quality of samples.
- Site-specific trigger values should be developed for the IWTP. Greencap's trigger level review report issued in July 2020 should be considered in the developing of the trigger levels.
- Deeper bores should be installed at MP97/01, MP97/02, MP97/03, MP97/04, MP97/05, MP00/07 and MP00/08, as they are all less than 2m deep and have been dry during the majority of sampling events. This would increase the likelihood of obtaining samples from these bores to allow monitoring of potential impacts from site activities associated with the operation of the WwTP.

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# April 2021 Quarterly Report Trility Pty Ltd

### Integrated Water Treatment Plant and Wastewater Treatment

Plant, Agnes Water

Appendix A: Groundwater Field Sampling Records

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Adelaide | Auckland | Brisbane | Canberra | Darwin | Melbourne | Newcastle | Perth | Sydney | Wollongong



DESAL .....

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# Groundwater Monitoring Standing Water Level Me

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	1625		Desal 1	Desal 2	History and
27-8-20	0-11-0		2.390	2.748,	Desal 3
24-9-90	0740		2.350	3.736	3-140
21/10	0900		2.336	a second	3.082
31.10.20	0630		1326	2:759	3.042
25-11-20	1130		133.0	2770	29.0
9-12-20	0730	p4( 6) Personal inform	2460	2875	210
	0750	p4( 6) Personal Inform	2.505	-2012	3-183
20	1 1130		7.122	2.910	3:120
25-2-2021	1440		2:678	2.910 3.027	3.285
MARCH	NOT DONE	-	2.798	3. 20	3.380
22-4-2021	THE LONE			- Alan	2.290
24	0830		2.450	1	
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Dient: Project: .ocation:		Trility Groundwater b Agnes Water, C	ore installation a	nd sampling	-0: 19	Sampled t	4( 6) Person	al information		
DESAL	1	WELL DEFAILS Well depth. Well diameter Casing type:	6:5 SOM	41	Water meter Turbidity Meter	Peristaltic (low flo	w)	GEO#	-/	
1000 C	Amount purged	Initial water leve Cumulative	Water Level	Temperature	) interphase probe DO	Sp. Conductivity	Salinity	F#	205	
Time	101	putged (L)	(m)	C	Kset	u5/cm	PSU	pN Units	ORP mV	Turbidity NTU
2651	2	2	2.46	25.7	0.22	570	-	3.94	129	-
2844	2	4	2.46	25-9	0.15	463	-	4.09	72	1020
2846	2	6	2-46	25.9	0.12	456	-	411	38	-
0850	2	3	2.44	25,9	0.12	449	~	403	29	-
0854	9	102	2.46	25.9	O.H	445	-	41E	12	-
0892	2	12	2.46	25.9	0.11	447	-	14.13	5	-
0907	2	14	5.46	25.9	0.11	442	2	410	-27	
0906	5	16	2.4h	25,9	Out	449		1.10	-6-7	1
29102	9	18	2.46	25.9	ain	443	E	4.14	Th	-
0914	0	20	2:46	25.9	0.11	400	2-	14.10	-6.0	-
2918	0	22	9.46	15.9	0.12	ILE OF		4.10	-15.8	Caller
1900	5	24	7. H.	25.9	0.10	1600		11.00	11 00	-
1976	0	26	9.46	nr.a	0.13	453		4.10	-10.9	-
100	1-	20	GAM	nos	+1117	73 -	0	410	-17.1	
			21144	Lu	TAKEN					
	e (Breed)ngs	71/4	Drawdown	+ 10%	1.475)	- EN	1.000	100	Constant of	10.25
thin ranges)	2	N/A Des, weather	Crawdown -<10cm	1.10%	(1109)	( the second	z 10%	201	z 30mv	N/A
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ithin ranges) eid observations: bservations durin : Odours, sheens.	eg, Nearby activ ng Sampling:- turbidity, wate	rootour	ditory	Has water quelity Decontamination Samples Taken Metals Plastic* Preserved inorge Glass unlas (40mu Elass amber unp Plastic nutrients Plastic nutrients Plastic nutrients	meter and surpidits procedures foldown red inorganics (11) inics (12)CmL) itserved (500mL) comL green/whith red inorganics (50	r meter been cellor ed? Yes	ebed in scoordanc	ie with operating a	namual and recorded	17 Yes
shin tangsa aid observations: sservations durin . Odcurs, sheens.	eg, Nearby activ ng Sampling:- turbidity, wate	rootour	ditter	Has water quality Decontamination Samples Taken Wetais Plastic* Plastic unpreserved inorga Glass viais (40mL Blass amber unp Plastic unpreserved Plastic unpreserved Plastic unpreserved Blastic nutrients Blasts amber unp	meter and turbidit procedures follows red inorganics (1) inics (1350mL) formL green/white formL green/white formL light green reserved (100mL)	y meter been celibri id? Yes ) E CmL)	ebed in scoordanc	ie with operating a	namual and recorded	17 Yes
ithin ranges) eid observations: bservations durin : Odours, sheens.	eg, Nearby activ ng Sampling:- turbidity, wate	rootour	dittery Color	Has water quality Decontamination Samples Taken Wetais Plastic* Plastic unpreserved inorga Glass viais (40mL Slass smoter unp Plastic unpreserv Plastic unpreserved Blastic unpreserved Slass amber unp Plastic unpreserved Blastic unpreserved	meter and turbidit procedures follows red inorganics (11 anics (1350mL) ) reserved (500mL) 50mL (green/white red inorganics (50 60mL (ight green reserved (100mL) red inorganics (15	y meter been celibri ed? Yes ) cmL]	ebed in scoordanc	ie with operating a	namual and recorded	17 Yes
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baservations durin s. Odouts, sheens, (OLOU) NOT T SLIGH ONITORING WEL ameter of well ca	ng Sampling:- turbidity, wate R URBID TODO	rootour	ditory	Has water quality Decontamination Samples Taken Wetais Plastic* Plastic unpreserved inorga Glass viais (40mL Slass smoter unp Plastic unpreserv Plastic unpreserved Blastic unpreserved Slass amber unp Plastic unpreserved Blastic unpreserved	meter and turbidit procedures follows red inorganics (11 anics (1350mL) ) reserved (500mL) 50mL (green/white red inorganics (50 60mL (ight green reserved (100mL) red inorganics (15	y meter been celibri ed? Yes ) cmL]	ebed in scoordanc	ie with operating a	namual and recorded	17 Yes
Internations during biservations during biservations during biservations during biservations during biservations during COLOUN NOT T SLIGH ONITORING WELL amoter of well co ameter of hole du	eg. Netarby activ	rootour	dittery	Has water quality Decontamination Samples Taken Wetais Plastic* Plastic unpreserved inorga Glass viais (40mL Blasts amber unp Plastic unpreserved Plastic unpreserved Blastic unpreserved Blastic unpreserved Blastic unpreserved Blastic unpreserved Destic unpreserved Destic unpreserved Destic unpreserved Destic unpreserved Destic unpreserved DESIGNATES S	meter and turbidit procedures following reserved (500mL) inteserved (500mL) fed Inorganics (50 60mL light green reserved (100mL) red Inorganics (10 AMPLES FILTEREC	y meter been celibri ad? Yes b cmul cmul cmul cmul cmul	ebed in scoordanc	ie with operating a	namual and recorded	17 Yes
Internations during baservations during baservations during baservations during baservations during baservations during baservations during baservations during NOT T SLIGH SLIGH ONITORING WELL ameter of well ca ameter of hole d Volume of drill-	ng Sampling:- turbidity, wate R URBID TODE	rotour POUR	412tm	Has water quality Decontamination Samples Taken Metals Plastic* Preserved inorga Stass viais (40m) Elastic unpreserv Plastic unpreserv Plastic unpreserv Plastic unpreserv Plastic unpreserv * DESIGNATES S	meter and turbidit procedures follows red inorganics (1), nics (250mL) J reserved (500mL) ford (norganics (50 60mL (jpt green reserved (200mL) red inorganics (25 AMPLES FILTEREC 0.0	y meter been celibri ad? Yes b cmul cmul cmul cmul cmul cmul cmul cmul	ebed in scoordanc	ie with operating a	namual and recorded	17 Yes
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22-265



llenti rojecti ocation:	h Groundwater bore Installation on: Agnes Water: Old WELL DETAILS					Sampled I Date: 22	p4( 6) Persor	nal information		
		The second secon			SAMPLING EDUIP					
732	-	she is and in a set of the second	50 m	(m)	Sampling device, A	Peristalitic (low flo	IW)	GEO#		
DESAL	2	Well diameter	79 M	pr.	Water meter			VS# PROT		_
The New	-	Casing type:	IVC	-	Turbidity Meter			TM#		
		Initial water lev	AND INCOMENTATION OF TAXABLE PARTY.	(77)	and the second se	the second se		124		
Time	nuonut bruged		Water Level	Temperature		Sp. Conductivity	Salinity	p.H	ORP	Turbidity
-	0.1	purned (L)	(m)	A	Nat	JuS/cm	PSU	White	mV	NTU.
9951	0	2	2073	24.5	0.27	(38	1	2.97	78	177
007	6	et.	0,70	OILE	1.07	The second second	-	2.00	90	1
UUF	1	T	2:1-2	24.2	DEAL	189	1000	276	12	
10 06	2	6	2.73	24.5	10.19	195	-	4002	99	-
010	0		071	ALL E	0 00		-	1100	165	-
000		-8	2.17	24.2	0.73	196		4.02	105	-
Im 14	5	10	7.79	045	0.02	195	-	4.02	110-1	1
	6	10	5		V 60	and the second sec	1000	1004	00	
018	2	12	2.13	24.5	0.73	197	-	4:06	107	-
000	0	14	0.72	OLE	0.74	197		11-	111	-
049		1.7	10-10	27.2	ULT	110	-0	4-06		0-00
026	2	16	2.73	24.5	0.25	199		4-06	114	1000
030	=).	18	1.72	01.5	0.05	199		4+09	114	1000
0.00	- free	0	+1-		UL	and the state		1.01	11-1-	
			5	AMPLE	STAR	EN				
				A CONTRACTOR	A CONTRACTOR OF THE OWNER					
							_		1	
							) <u> </u>			100
							_			
ablisation Criteria	(Breadings	TOR	Drawdown	10 HAN1	Con		2146	500	1.99(110)	75.92
(chin (enges)	(Set Solars Hou	N/A vities, weather	Drawdown <10cm	± 10%	GID)	-	± 10%	± 0.1	z 10mv	N/A
(thin (enges)	(Set Solars Hou			± 10%	GID)		± 10%	20.1	: 10mv	N/A
(thin (enges)	(Set Solars Hou		<10cm	Has water quality	meter and turbidity	meter been callb				
iblin : anges) aid observations:	eg Nearby acti		<10cm	Has water quality Decontamination		meter been callb				
ibin (anges) aid observations: bservations durin	eg Nearby actions and a second se	vities, weether	<10cm	Has water quality Decontamination Samples Taken	meter and turbidity	meter been callb		za with operating m		
ibin (anges) eld observations: eld observations: eld observations durin bservations durin 1 Ociouts, sheens.	eg Nearby actions the second sec	vities, weather	<10cm	Has water quality Decontamination	meter and turbidity	meter been callb	rated in accordan	za with operating m	usincual and recorde	d∓ Yes
thin renges) id observations: id observations: observations durin Didours, sheens.	eg Nearby actions the second sec	vities, weather	<10cm	Has water quality Decontamination Samples Taken	meter and turbidity	meter been callb	rated in accordan	za with operating m	usincual and recorde	d∓ Yes
ibin (anges) eld observations: eld observations: eld observations durin bservations durin 1 Ociouts, sheens.	eg Nearby actions the second sec	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic*	meter and turbidity procedures follows	meter been callb rd? Yes	rated in accordan	za with operating m	usincual and recorde	d∓ Yes
ibin (anges) eld observations: eld observations: eld observations durin bservations durin 1 Ociouts, sheens.	eg Nearby actions the second sec	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic*	meter and turbidity procedures follows	meter been callb rd? Yes	rated in accordan	za with operating m	usincual and recorde	d∓ Yes
thin (enges) (id observations: (id observations) (id observations) (id observations) (id outs, sheens,	eg Nearby actions and a second se	vities, weather	<10cm	Has water quality Decontamination Samples Taken Wetals Plastic* Plastic unpresen Preserved inorga	meter and turbidity procedures follows yed inorganics (11, anics (250mL)	meter been callb rd? Yes	rated in accordan	za with operating m	usincual and recorde	d? Yes
thin (enges) (id observations: (id observations) (id observations) (id observations) (id outs, sheens,	eg Nearby actions and a second se	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreserved inorge Glass viais (40m)	meter and turbidity procedures follows ved inorganics (1), enics (250mL) L)	v meter been cellb d <sup>2</sup> Yes	rated in accordan	za with operating m	usincual and recorde	d∓ Yes
ibin (anges) eld observations: eld observations: eld observations durin bservations durin 1 Ociouts, sheens.	eg Nearby actions and a second se	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorga Glass viat (40m Glass amber unp	meter and turbidity procedures follows ved inorganics (11, enics (250mL) () sreserved (500mL)	r meter been cellb d? Yes	rated in accordan	za with operating m	usincual and recorde	d∓ Yes
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thin (enges) (id observations: (id observations) (id observations) (id observations) (id outs, sheens,	eg Nearby actions and a second se	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpresen Preserved income Glass amber unp Plastic unpresent Plastic unpresent	meter and turbidity procedures follows ved inorganics (1), enics (250mL) (1) reserved (500mL) (60mL green/white ved inorganics (50	r meter been cellb d? Yes	rated in accordan	za with operating m	usincual and recorde	d∓ Yes
ibin (anges) eld observations: eld observations: eld observations durin bservations durin 1 Ociouts, sheens.	eg Nearby actions and a second se	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpresen Preserved inorge Glass what (40m Glass amber unp Plastic nutrienta Plastic nutrienta Plastic unpresen Plastic unpresen Plastic untrienta	ved Inorganics (1), procedures follows ved Inorganics (1), preserved (500mL) (50mL) green/white ved Inorganics (500mL) ved Inorganics (500mL) form, light green	rmeter been callb d7 Yes ) ) GmL)	rated in accordan	za with operating m	usincual and recorde	d∓ Yes
ibin (anges) eld observations: eld observations: eld observations durin bservations durin t Odouts, sheens.	eg Nearby actions and a second se	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpresen Preserved inorga Glass wiais (40m Glass amber unp Plastic unpresen Plastic unpresen Plastic unpresen Plastic untrients Glass amber unp	wed inorganics (1L enics (250mL) i) sreserved (500mL) (50mL green/white ved inorganics (50 60mL ight green (60mL light green	rmeter been cellb rd <sup>7</sup> Yes	rated in accordan	za with operating m	usincual and recorde	d∓ Yes
thin renges) id observations: id observations: observations durin Didours, sheens.	eg Nearby actions and a second se	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Preserved inorga Glass wats (40m Glass amber unp Plastic unpreser Plastic unpreser Plastic unpreser Plastic unpreser Plastic unpreser Plastic unpreser	wed Inorganics (1L anics (250mL) (1) 60mL green/white yed inorganics (500mL) 60mL ight green (500mL) ight green (500mL) ight green discorred (100mL) yed inorganics (25	e CmiL)	rated in accordan	za with operating m	usincual and recorde	d∓ Yes
ibin (anges) eld observations: eld observations: eld observations durin bservations durin 1 Ociouts, sheens.	eg Nearby actions and a second se	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Preserved inorga Glass wats (40m Glass amber unp Plastic unpreser Plastic unpreser Plastic unpreser Plastic unpreser Plastic unpreser Plastic unpreser	wed inorganics (1L enics (250mL) i) sreserved (500mL) (50mL green/white ved inorganics (50 60mL ight green (60mL light green	e CmiL)	rated in accordan	za with operating m	usincual and records	d∓ Yes
Iblin ranges) eld observations: did observations: bservations durin s Odours, sheens. COLOC S L 1 G H NO O	ng Semplings- turbidity, wet R T L D D D h	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Preserved inorga Glass wats (40m Glass amber unp Plastic unpreser Plastic unpreser Plastic unpreser Plastic unpreser Plastic unpreser Plastic unpreser	wed Inorganics (1L anics (250mL) (1) 60mL green/white yed inorganics (500mL) 60mL ight green (500mL) ight green (500mL) ight green discorred (100mL) yed inorganics (25	e CmiL)	rated in accordan	za with operating m	usincual and records	d? Yes
Ibin renges) eld observations: bservations durin g Odours, sheens, COLOC SLIGH NO O	ng Samplings- turbidity, wat R T LY DOU fr	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpresen Preserved inorge Glass viais (40m Glass amber unp Plastic nutrienta Plastic nutrienta Glass amber unp Plastic unpresen Plastic unpresen Plastic unpresen (* DESIGNATES	wed Inorganics (1L anics (250mL) (1) 60mL green/white yed inorganics (500mL) 60mL ight green (500mL) ight green (500mL) ight green discorred (100mL) yed inorganics (25	e CmiL)	rated in accordan	za with operating m	Tripiloster CA	di Yes Örder
Ibin ranges) and observations beervations during of OLOC SLIGH NO O NO O	ng Sampling: turbidiy, wat R T LY DOU fo L VOLUMES:- asing:	vities, weather	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpresen Preserved inorge Glass amber unp Plastic nutrienta Plastic nutrienta Plastic unpresen Plastic unpresen	wed Inorganics (1L anics (250mL) (1) 60mL green/white yed inorganics (500mL) 60mL ight green (500mL) ight green (500mL) ight green discorred (100mL) yed inorganics (25	e CmiL)	rated in accordan	za with operating m	Tripiloster CA	d? Yes
International Criteria International Action Criteria International Action International Actional Acti	ng Samplings turbidity, wat T LY DOU fo L VOLUMES:- asing: Irilled:	vities, weather	<10tm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpresen Preserved inorga Glass vials (40m Glass amber unp Plastic unpresen Plastic unpresen Plastic unpresen Plastic unpresen Plastic unpresen Plastic unpresen mm mm	ved Inorganics (IL enics (250mL) () sreserved (500mL) () form, green/white ved Inorganics (500mL) ved Inorganics (25 form, light green steserved (100mL) ved Inorganics (25 SAMPLES FILTERED	e Crriu) Omiu) DIN PIELD)	rated in accordan	za with operating m	Tripiloster CA	di Yes Örder
Ibin senges) eld observations: bservations durin g Odours, sheens, COLOC SLIGH NO O IONITORING WEL iameter of well cr iameter of well cr iameter of hole d	ng Samplings- turbiolity, wat R T LY DOU fo L VOLUMES:- asing: irillad: ng only	vities, weather	<10tm	Has water quality Decontamination Samples Taken Metals Plastic Plastic unpresen Preserved inorga Glass what (40m Glass amber unp Plastic unpresen Plastic unpresen Plastic unpresen Plastic unpresen Plastic unpresen Plastic unpresen Plastic unpresen (* DESIGNATES S mm mm mm	ved Inorganics (1L enics (250mL) L) srocedurez foliows ved Inorganics (1L enics (250mL) L) srocedurez foliows ved Inorganics (50 60mL (geter/white ved Inorganics (50 60mL) (get green stesenved (100mL) ved Inorganics (25 SAMPLES FILTERES	meter been callb rd? Yes i cmiL)	rated in accordan	za with operating m	Tripiloster CA	di Yes Örder
Ibin ranges) and observations beervations during of OLOC SLIGH NO O NO O	rg Nearby actions of the second secon	er colour TURBI	<10tm	Has water quality Decontamination Samples Taken Metals Plastic* Preserved inorga Glass amber unp Plastic unpreser Plastic nutrients Plastic nutrients Plastic unpreser (* DESIGNATES S mm mm m3 (kL) m3 (kL)	wed Inorganics (1L anics (250mL) (1) 60mL green/white ved inorganics (50 60mL ight green foreserved (500mL) ved inorganics (50 60mL ight green secenved (100mL) ved inorganics (25 54MPLES FILTERED	e CmL) OmL) D L per metre	rated in accordan	za with operating m	Tripiloster CA	di Yes Örder
In tanges) eld observations: eld observations bservations durin colours, sheens colours, colours, sheens colours, colours,	rg Nearby actives and active active actives and active active actives active actives active actives ac	er colour TURBI	<10tm	Has water quality Decontamination Samples Taken Wetals Plastic* Plastic unpresen Preserved inorga Glass amber unp Plastic nutrients Plastic unpresen (* DES-GNATES S mm mm m2 (kL) m3 (kL)	meter and turbidity procedures follows ved Inorganics (1L anics (250mL) L) stesenved (500mL) 60mL light green/white ved Inorganics (50 60mL light green/white sesenved (100mL) wed Inorganics (25 54MIPLES FILTERED 0.0 0.0	meter been callb rd? Yes i cmiL) cmiL) cmiL) cmiL) cmiL) cmiL) cmiL) cmiL) cmiL) cmiL) cmiL) cmiL)	rated in accordan	za with operating m	Tripiloster CA	di Yes Örder

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lient: roject: ocation:		Trility Groundwater bo Agnes Water, Q	ore Installation ar	nd sampling		Sampled b	6) Personal	informati		
		WELL DETAILS		_	SAMPLING EQUIP					
		Well depth:	5.0	(m)	Sampling device 1	Peristaltic Low flow	0	GEOH		
DIGAL	2	Well diameter	50 an		Water mater			YSH PROT	· V	
DEGAL	2	Casing type:	PVC.		Turbidity Meter			TM#		
	11	Initial water level	NAME AND ADDRESS OF TAXABLE PARTY.	and the second s	Interphase probe:		-	IP#		
Time	mountputged	Cumulative	Water Lavel	Temperature	DO	Sp. Conductivity uS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
1000	11	purged [1]	(m)		N sat	and the second se	121	A CONTRACT		
137	2	2	3.40	127.2	0.29	1818		4.51	-128	
141	2	et	3-41	17.1	0-38	1809	-	451	-132	-
A COLORED	5	X	210	23	0.58		100	11.51	-135	10-0-0
145	6	0	2.46	Lin		1822		477	-(22	1000
149	2	8	3.43	27.2	0.81	1810	-	455	-136-	
153	0	10	2.112	01.9		1225	-	Lang B	-136.	-
157	5	18	2.11	200	and the second sec			102		-
121	1	12	3.44	21-2	1:13	1812	****	4.53	-136	
001	9	14	3.45	27.2	1.23	1804	7.	4.54	-136	-
Jak	5	1/	010	07 0	1.32	1		11 00	-135	-
202	-	16	3.49	41.4		1788		7.37	A REAL PROPERTY AND A REAL	-
1209	2	18	3.46	27.2	1.41	1814		4-93	-135	
10,2	2	20	3.46	97.9	1.49	1790		454	-135	_
the 1			and the	00 2	1 hole	1110		11		-
1217	2	22	3.46	71	1.56	[7(8)	-	T-54	+(35	10-
1221	2	24	3.46	27.2	1.65	1784	-	4.55	-134	-
1066	0	26	3.46	20	1.71	1770	-	4.54	-134	100
		-10		1 1 4 1			the second se		2010	~
1000	-	00		208		- interest	1	11 200	- inte	
1229	2	28	3.46	27.2	1.75	1772	1 at	4.55	- 34	-
ithin ranges)	(Breadings	N/A	3.46 Drawgenn <105A	27-2 HPLE	1.75 5 TAK	1775	z 10%	4.55	± 10my	N/A
tablication Criteria (thin ranges)	(Breadings	N/A	Drawgenen A	27-2 HPLE	1.75 FAK	1772		1.36	1 1 1 1	N/A
tablication Criteria	(Breadings	N/A	Drawgenen A			y meter been dalfor	± 10%	20.1	1 1 1 1	
tabilitation Criteria /triin ranges) eld observations: a	(Breadings og Nearby activ	N/A lities, weather	Drawgerten A		meter and turblelit procedures follow	y meter been dalfor	± 10%	20.1	± 10my	
isbilitation Criteria Isbin ranges) eld observations: e bservations durin g. Ocours, sheers.	(Breadings og Neurby acti- ng Sampling)- turbidity, wat	N/A lities, weather	Drawgerten A	Decontamination Samples Taken	meter and turblelit procedures follow	y meter been dalfor	z 10% ated in accordan	z 0.1	± 10my	d? Yes
tabilitation Criteria (triin ranges) eld observations: e bservations durin g: Ocours, sheers.	(Breadings og Neurby acti- ng Sampling)- turbidity, wat	N/A lities, weather	Drawgerten A	Decontamination Samples Taken Metals Plastic*	meter and turblalt	y meter been callor ec <sup>1</sup> Yes	z 10% ated in accordan	z 0.1	± 10my	d? Yes
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tabilitation Criteria (triin ranges) eld observations: e bservations durin g: Ocours, sheers.	(Breadings og Neurby acti- ng Sampling)- turbidity, wat	N/A lities, weather	Drawgerten A	Decontamination Samples Taken Metals Plastic* Plastic unpresen Preserved loong	vmeter and turblalt transcedures follow rved inorganics (1) (an(cs (250mL)	y meter been callor ec <sup>1</sup> Yes	z 10% ated in accordan	z 0.1	± 10my	d? Yes
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Field Technician #1

Field Technician #2

1230

K



### **Groundwater Monitoring Standing Water Level Measurement**

\*\*NB\*\* Measurement to be taken as nem from top of pore casing

Date 7-9-2020 8-12-2020 21-1-2021 24-2-2021 MARCH 19-4-2021 20-4-2021	0300 1000 1000 Not	4( 6) Personal info	511 1 2.585 2.684 2.720 MOST BOLL 2.615	5TP 2 4-662 4-697 4-655 5 NOT A 4-420	97-01 1.250 1.384 1.227 0.908 CESSABLE 0.510	97-2 1.665 DRJ DRJ DRJ DRJ DVE TO 1-275	97-3 1.352 1.352 1.348 1.346 FLOODIX 0 820	97-4 1-110 1-108 19-65	97-5 0.770 0.754 0.740 0.512	0.007 DRY DRY DRY DRY 1-360	0.000 DAY DRY DRY DRY 1.035
						CL 200	2				
			6.10 10	isher			•				10



Project:		Trility Groundwater b	ore Installation a	nd sampling		Job No: Sampled by:	14p4( 6) Pers	onal informati	0	
Location		Agries Water, C		ine secologically.		Date: 19	-4-2	021	作	
	1	WELC DETAILS			SAMPLING EQ			1		
0-	10	Well depth: Well diameter:	1220		Sampling devi Water meter	ce Peristaltic (low fl	ow)	GEON ST		
71	IZ	Casing type	63 m	-	Turbidity Met	et		TMM		
	1	thitlal water leve	THE OWNER AND INCOME.	A REAL PROPERTY AND A REAL	COMPANY OF TAXABLE PARTY.	Correction and the second s		1P#		
Time	Amount purged	Cumulative purged (L)	Water Level	Temperature	DO	Sp: Conductivity u\$/cm	Salinity	pH Units	ORP mV	Turbidity
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		00-0	NO	pri	PIL	NOT RE	Lave	1.	1	
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	PR							-	-	
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					-	the second				-
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tabilisation Crite	erla (Praadinos	100702	Drawdown			FA				
(thin ranges)	isteg. Nearby activ	N/A	<10cm	= 10%	3.20%	4.5%	± 10%	10.1	± 10mv	N/A
			2							
			cher	Has water quality Decontamination	meter and turbl procedures folk	dity meter been callo owed? Yes	rated in accordar	ice with operating	manual and recorde	d7 Yes
bservations du	uring Sampling:-		sher	Decontamination Samples Taken	meter and turbi	dity meter been callo owed? Yas	rated in accordar Number	Duplicte: QA	manuai and recorde Triplicates QA_	d7 Yes Order
bservations du	uring Sampling:- ma. turbidity, wata	r colour	she	Decontamination	meter and turbi	dity meter been callo dwed? Yes				
bservations du 1. Odours, shee TUR	uring Sampling:- ma turbidity wate BID	r colour	she	Decontamination Samples Taken	meter and turbi procedures tors	dity meter been cellb swed <sup>3</sup> Yes				_
beervations du 1 Odours, shee TUR	uring Samplings ma turbidity, wate BID	r eetsur JO	Isher	Decontamination Samples Taken Metais Plastic* Plastic unpreserv	procedures fork	olved <sup>3</sup> Yes				
beervations du 1 Octours, shee TUR NO	uring Samplings- ma. turbidity, wate BID COLOUI	r colour JO	she	Decontamination Samples Taken Metais Plastic* Plastic unpresen Preserved Inorga	procedures fois red loorganics nics (250mL)	olved <sup>3</sup> Yes				
barriations du 1 Ocours shee TUR NO	uring Sampling:- ma. turbidity, wate BID COLOUI		she	Decontamination Samples Taken Metals Plastic* Plastic unpreserv Preserved Inorga Glass vials (40m) Glass amber unp	red Inorganics nics (250mL) ) reserved (500m	rul)				
bservations du 1 Odours, shee TUR NO	uring Sampling:- ma turbidity, wate BID COLOUI	r colour 2	she	Decontamination Samples Taken Metals Plastic* Plastic unpreserv Preserved Inorga Glass vials (40m) Glass amber unp Plastic nutrients	red Inorganics nics (250mL) ) reserved (500mL green/w	ruj				
beervations du 5 Odours, shee TUR NO	uring Samplings ma turbidity, wate BID COLOUI	r cellour 2	she	Decontamination Samples Taken Metais Plastic* Plastic unpreserv Preserved Inorga Glass vials (40mL Glass ambet unp Plastic unpreserv Plastic unpreserv	ved Inorganics nics (250mL) ) reserved (500m eson, green/w red Inorganics (	(11) (11) (500mLk				
barvations du 1 Odours, shee TUR NO	uring Samplingt- ma: turbidity, wate BID COLOUM	r colour 2	she	Decontamination Samples Taken Metais Plastic* Plastic unpresens Preserved Inorga Glass vials (40m) Glass amber unpresens Plastic nutrients Plastic unpresens Plastic unpresens Plastic nutrients Glass amber unp	/sd Inorganics /sd Inorganics inics (250mL) ) reserved (500m 60mL light green/w reserved (100m	200ed3 Yes [11,] hite (500m1) en n1,]				
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oject: cation:		Agnes Water, QI				Date: 19-	4-202	./		_
	Ann march M	WELL DETAILS			SAMPLING EQU	IPMENT				
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971	10	Well diameter	1:69 65 mm		Water meter			V\$[#		
111	~	Casing type:	PVC		Turbidity Mete		_	TM#		
	Amountpurged	Comutativa	Wate Level	Témperature	interphase proi	So. Conductivity	Salinity	pH	ORP	Turbidity
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NAMES OF TAXABLE PARTY.	s; eg. Nearby activ	and the second se	<1007	I LUN	(rit)		± 10%	201	± 10mV	N/A
NAMES OF TAXABLE PARTY.	s: eg. Nearby activ	and the second se	<lorm< th=""><th></th><th></th><th></th><th>± 10%</th><th>201</th><th>± 10mM</th><th>NA</th></lorm<>				± 10%	201	± 10mM	NA
NAMES OF TAXABLE PARTY.	a: eg. Nearby activ	and the second se	0	00 8		idity meter been call				
id observation		and the second se	100	Has water qualit Decontaminatio	y meter and turb	idity meter bean call	stated in accordan	ice with operating	manual and records	id? Yes
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id observation	uring Sampling:-	lties, weather	Sted	Has water qualit Decontaminatio	ty meter and turb	idity meter bean call	stated in accordan	ice with operating	manual and records	id? Yes
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ld observation	uring Sampling:-	lties, weather	Sted	Has water qualit Decontaminatio Samples Taken Mastle unpress Preserved inor Glass viais (40r Glass amber un Plastic nutrient Flastic unpress Flastic nutrient Glass amber un	ty meter and turb in procedures following genics (250mL) mL) horeserved (500 to 60mL green/W trived Inorganics to 60mL green/W trived Inorganics to 60mL light green horeserved (100	idity meter been calls awed? Yes (11) mL3 mL3 mL4 (\$500mL) em mL1	stated in accordan	ice with operating	manual and records	id? Yes
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ind observations du p Goburs, thee TU (OLC	uring Sampling: ns. surbidity, was たちしつ つしん	lties, weather	Sted	Has water qualit Decontaminatio Samples Taken Netals Plastic * Preserved inor Glass vials (40r Glass amber ut Plastic unpress Plastic nutriem Glass amber ut Plastic nutriem Glass amber ut Plastic nutriem	y meter and turb n procedures follo- erved inorganics ganics (250mL) rtL) noreserved (500 ts 60mL rgen/ts noreserved (100 procedures follow) a formul light gre- noreserved (100 procedures follow)	idity meter been call awed? Yes (11) mL) mL) en mL) (250mL) en mL) (250mL)	stated in accordan	ice with operating	manual and records	id? Yes
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Fleid Technician #1



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		initial water leve	the second se	(m)	the second se			And in case of the local division of the loc	ORP I	Turbidity
T A	Amount burged	Cumulatiye	Water Level	Temperatura	DQ	Sp. Conductivity	Salinity	pH	mV	NTH
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ilisation Criteri In ranges; I observationa;	a (žreeding) ; eg. Nearby acti	N/A	Drawddwh c10cm	110%	£109		± 10%	201	± 10mw	NŻA
In ranges);	Consection -	1000	and the second s	± 10%	5103		± 10%	101	± 10mv	N/A
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97/5     Well DeTAILS     SAMPLING EQUIPMENT       Well depth:     0.512     (m) Sampling device. Peritalitir (low flow)     SEO#       Well dameter:     0.512     (m) Sampling device. Peritalitir (low flow)     SEO#       Valar meter     Visit     Visit     Visit       Casing type     PVC     Turb/dity Neter     TM#       Initial water level:     0.512     (m) Interphase probe:     IP#	Client: Projecti Jocation:	112	Trility Groundwater b Agnes Water, 0	ore installation a 3d	nd sampling		Sampled by	4p4( 6) Perso - 4 - <u>2</u> 9,	nal informatior		
The number of available set of a state of the set of a st	97	15	Well destri: 0 • 512 (m Well diameter: 65000 Casing type PV'C Initial water level: 0 • 512 (m			Sampling deute, Peristeltic (low flow) Water meter Turb/Sity Meter Interphase probe:			VS(# IM# IP#		
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Alexandro Cherice Breadings     N/A     Devendowin     ±10%     ±0%     ±10%     ±0.1     ±10m     N/A     Devendowin     ±10%     ±0%     ±10%     ±0.1     ±10m     N/A     Devendowin     ±10%     ±0.1     ±10m     N/A     deventor     the observations og Nearby activities, weather      deventor							_				
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		irla (Breadings	N/A		± 10%	- 105	(13%)	± 10%	±0.1	± 10m/	N/A
Decontamination procedures followed? Yes         Decontamination procedures followed? The process followed? Yes         Protectived inorganics (11)       Decontamination procedures followed?         Preserved inorganics (200mL)       Decontamination process followed?         Plastic numers form light green       Decontamination process (250mL)       Decontamination process (250mL)         Plastic numers form light green       Decontamination process (250mL)       Decontamination process (250mL)         Plastic numers form light green       Decontamination process (250mL)       Decontamination process (250mL)         Plastic numers of well casing:       Decontamination process (250mL)       Decontaminatin process (250mL)         Plas				Ś							
biervations during Sampling:	_							orated in accordan	ice with operating i	nanusi and recorde	d7 Yes
Coours, sheens, turbidity, water colour     Metais Plastic*     Metais Plasti*     Metais Plastic*     Metais Plastic*     Metais Plastic*	biervations de	uring Sempling:-		2-	and the second second	receiption and the	west tes	Number	Duplicte: QA	Triplicate: QA	Older
Preserved inorganics (250mL)     Glass vials (40mL)       Glass vials (40mL)     Glass vials (40mL)       Glass vials (40mL)     Glass vials (40mL)       Glass amber unpreserved (500mL)     Plastic nutrients 60mL green/white       Plastic unpreserved inorganics (500mL)     Plastic unpreserved inorganics (500mL)       Plastic unpreserved inorganics (500mL)     Plastic unpreserved inorganics (500mL)       Plastic unpreserved inorganics (200mL)     Plastic unpreserved inorganics (200mL)       Plastic			et colour								
Preserved inorganics (250mL)     Glass vials (40mL)       Glass vials (40mL)     Glass vials (40mL)       Glass vials (40mL)     Glass vials (40mL)       Glass striber unpreserved (500mL)     Plastic nutrients 60mL green/white       Plastic nutrients 60mL light green     Glass amber unpreserved (500mL)       Plastic nutrients 60mL light green     Glass amber unpreserved (100mL)       Plastic unpreserved (rorganics (250mL)     Glass amber unpreserved (100mL)       Plastic unpreserved (rorganics (250mL)     Fill	TUP	BID	00				1.11				
Glass vials (40mL)							(34)				
Plastic nutrients 60mL green/white Plastic Linpreserved Inorganics (500mL) Plastic nutrients 60mL light green Glass amber unpreserved (100mL) Plastic unprese					Glass vials (40m	11				1.0	
Plastic unpreserved inorganics (500mL)     Plastic nutrients 60mL light green       Plastic nutrients 60mL light green     Siass amber unpreserved (100mL)       Plastic unpreserved inorganics (250mL)     +       Plastic unpreserved inorganics (250mL)     +       INITORING WELL VOLUMES:					and the second s	the second se			<u> </u>		
Islass amber unpreserved (200mL) Plastic unpreserved (200mL) * DESIGNATES SAMPLES FILTERED IN FIELD) * ONITORING WELL VOLUMES:- ** DESIGNATES SAMPLES FILTERED IN FIELD ** ONITORING well casing: ************************************											
Plastic unpreserved inorganics (250mL)     -       * DESIGNATES SAMPLES FILTERED IN FIELD)     -       NONITORING WELL VOLUMES:- iameter of well casing:     mm       iameter of well casing:     mm       y Volume of casing only     0.000000 m3 (kL)     0.00 L per metre       ) Volume of annulus around casing     0.000000 m3 (kL)     0.00 L per metre       i) Yolume of annulus around casing     0.000000 m3 (kL)     0.00 L per metre       i) Total Bore Yolume + 0.3(3) + (1)     0.000000 m3 (kL)     0.00 L per metre					Pastic nutrient	s 60mu light grea	15		1		
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IONITORING WELL VOLUMES:- ameter of well casing: iameter of hole drilled: ) Volume of casing only ) Volume of drill-hole 0.000000 m3 (kL) Volume of annulus around casing 0.000000 m3 (kL) 0.00 L per metre 0.000000 m3 (kL) 0.00 L per metre											-
iameter of well casing:         mm           iameter of hole drilled:         mm           ) Volume of casing only         0.000000 m3 (kL)         0.00 L per metre           ) Volume of drill-hole         0.000000 m3 (kL)         0.00 L per metre           ) Volume of annulus around casing         0.000000 m3 (kL)         0.00 L per metre           ) Volume of annulus around casing         0.000000 m3 (kL)         0.00 L per metre           ) Total Bore Volume = 0.3(3) + (1)         0.000000 m3 (kL)         0.00 L per metre	ONITOPILO			S			acted an entrander and				-
Isometer of hole drilled:         mint           1) Volume of casing only         0.000000 m3 (kL)         0.00 L per metre           2) Volume of drill-hole         0.000000 m3 (kL)         0.00 L per metre           3) Volume of annulus around casing         0.000000 m3 (kL)         0.00 L per metre           4) Total Bore Volume = 0.3(3) + (1)         0.000000 m3 (kL)         0.00 L per metre	and the second sec	The second second second			Timm						
1) Volume of casing only         0.000000 m3 (kL)         0.00 L per metre           2) Volume of drill-hole         0.000000 m3 (kL)         0.00 L per metre           3) Volume of annulus around casing         0.000000 m3 (kL)         0.00 L per metre           4) Total Bore Volume = 0.3(3) + (1)         0.000000 m3 (kL)         0.00 L per metre		and the second		16 TH 10 You							
S) Volume of annulus around casing         0.000000 m3 (kL)         0.00 L per metre           4) Total Bore Volume = 0.3(3) + (1)         0.000000 m3 (kL)         0.00 L per metre				0.000000	5 m3 (ku)		D.00 Liper metre				
4) Total Bore Volume = 0.3(3) + (1) 0.000000 m3 (kL) 0.000 L per matre		asing only									
	1) Volume of c 2) Volume of d	rill-hole					0.00 Liper matre				
	1) Volume of c 2) Volume of d 3) Volume of a	rill-hole nnulus around co	1941 T	0.00000	3 m3 (kL)		0.00 Liper matre 0.00 Liper metre				

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Client: Projecti Location:	.00	Trility Groundwater b Agnes Water, C	ore Installation an	nd sampling		Sampled D	4p4( 6) Perso	nal information	ו	
00/	107	WELL DETAILS Well depth: Well diameter: Casing type initial water leve	1.20 5 m	PVC	) Sampling device Water meter Turbidity Meter	Weter meter YS# Turbidity Meter TM#				
Time	Amount purged	Comulative	Water Level	Temperature	00	Sp. Conductivity	Salinity	pH	ORP	Turbidity
1530	0.8	D.S	1.690	-	fist	µ\$/cm	PSU	Units.		NTU
13-0	0.0	BOR		DRY 9	DIP	NOTR	TONE	2		
								0		
_										
	-	_		-		-				<u>.</u>
						1	5	- <u> </u>		
						6				
				_		L.S				
						$\mathcal{D}$	19-			
tablisation Crite (thin ranges)	rle (Breedlrigs	N/A	Drawdown <10cm	2 10%	, 5105	(353)	± 10%	:01	± 10mv	NZA
			Ś			~				
			S	Has water quality Decontamination	meter and turbld procedures follow	ity meter been callb ved ?	rated in accordan	ics with operating r	nanuar and recorde	d? Yes
bservations du g. Cdours, shee	ring Samplings- ns, turbidity, wate	r çalour		Samples Taken Metais Plastic*	10		Number	Duplicte: QA	Triplitate: OA	Ordet
tu	BID	00						-		-
NO	ns turbidity wate 281 D COLOUA	2		Plastic unpresen Preserved inorga Glass viais (40m)	The second se	Щ				
				Plastic nutrients	SomL green/wh ved inorganics (5	te		12		
				Plastic nutrients	60ml, light green preserved (100m	1				_
					ved Inorganics (2 SAMPLES FILTER					
MONITORING W Diameter of well Diameter of hole 1) Volume of ca	casing: drilled: sing only	1	0.000000	πιπ π.α. π.3 (ku)		1.00 E për metre				
4) Total Bore Vo	III-hole nulus around cas ilume = 0.3(3) + (1 % porosity in sand	1	0.000000 0.000000 0.000000	m3 (kL) m3 (kL)	0	100 Liper metre 100 Liper metre 100 Liper metre				

Field Technician #1

# GREENCAP

Projecti		Trility Groundwater b	ore Installation an	nd sampline		Job No: Sampled b	p4( 6) Persor	al information		
ocation		Agnes Water, G				Date: 19	-4-20	221		
		WELL DETAILS			SAMPLING EQU	IDA RENT				-
2		Well deptn:	1.75	15 (17	And and an other than the second s	e Peristaltic llow fl	(1990)	GEOW		
001-	0	Well diameter:	650	74	Water meter			Y5(#		
00/	8	Cesing type:	p	yc	Turbidity Mate			TRAN		
	Amount purged	Cumulative	Water Level	Temperature	b) interphase prot	Address of the Owner of the Own		iP#		-
Time	(4)	Dutread (1)	(m)	C	- Nisat	5p. Conductivity uS/cm	Satinity	pH Lints	ORP mV	Turbidit NTU
1540	2	7	1.700					0.150	1014	NUD
1546	0.5	205		100.00	-	-		-	-	
1217	0.5		1-770			-	-	2 -	-	-
		BORE	RAND	RY +	DID 1	JOT RI	ECOVER	e		
			CARLON IN THE ISA	POV 10 NR		Contraction of the second				
								100		
							.0			
							1			
		1								
					5.75	1	5			
							D			2900
						1.5				
							D			
										N
tablikation Criter	la (Breadings		Drawdown							
Othin ranges)	OTTO AND	N/A tet. weather	Drawdown <10cm	± 10%	115)		± 10%	£01	2 10mv	N/A
Schin ranges)	OTTO AND		and the second se	± 10%			± 10%	£01	2 10mv	N/A
Othin ranges)	OTTO AND		<10cm	Has water quality	e meter and turbid	Ity meter been callp				
(thin ranges) ield observations	teg Nearby attiv		<10em	Has water quality Decontamination		Ithy matter been callbuild	rated in accordan	a with operating a	nenual and recorda	dî yes
observations dur	i ağ Nearby attiv	Let. weather	<10em	Has water quality Decontamination	e meter and turbid	lity meter been callp		a with operating a		
observations dur	i ağ Nearby attiv	Let. weather	<10em	Has water quality Decontamination	e meter and turbid	Itty måter been callb	rated in accordan	a with operating a	nenual and recorda	dî yes
observations dur	i ağ Nearby attiv	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic*	y meter and turbid	wed? Yes	rated in accordan	a with operating a	nenual and recorda	dī yes
observations dur	i ağ Nearby attiv	Let. weather	<10em	Hos water quality Decontamination Samples Taken Metals Plastic *	meter and turbid	wed? Yes	rated in accordan	a with operating a	nenual and recorda	dî yes
observations dur	i ağ Nearby attiv	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpreser Preserved inorg	v meter and turbid n procedures follow rved inorganics (1 anics (250mL)	wed? Yes	rated in accordan	a with operating a	nenual and recorda	dî yes
observations dur	i ağ Nearby attiv	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpreser Preserved loorg Blass yials (40m	v meter and turbid n procedures follow rived inorganics ( janics (250mL)	wed? Yes	rated in accordian	a with operating a	nenual and recorda	dī yes
observations dur	i ağ Nearby attiv	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpresent Preserved inorg Glass valis (40m Glass amber unp Plastic nutrients	v metar and turbid h procedures folion rved inorganics (i (anics (250mL) tu) preserved (500mL) tu) preserved (500mL)	wed7 Yes 1() (te	rated in accordian	a with operating a	nenual and recorda	dî yes
votin ranges) reid observations	i ağ Nearby attiv	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpresen Plastic unpresen Plastic unpresen Plastic nutrients Plastic nutrients Plastic unpresen	vietar and turbid hiproceduras folion vied inorganics ( janics (250mL) 14) preserved (500mL) 14) wed inorganics (5	1() 1() (t) (te 500mL)	rated in accordian	a with operating a	nenual and recorda	dî yes
votin ranges) reid observations	i ağ Nearby attiv	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpresen Preserved inorg Glass amber uny Plastic nutrients Plastic nutrients Plastic nutrients Plastic nutrients	vietar and turbid hiprocedures folion ved inorganics (1 anics (250mL) 14) preserved (500mL) 14) sed inorganics (5 60mL green/wh ved inorganics (5	wed? Yes 1() (te 500mL) n	rated in accordian	a with operating a	nenual and recorda	dî yes
observations dur	i ağ Nearby attiv	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpreser Preserved inorg Glass viais (40m glass amber uni Plastic nutrients Plastic unpreser Plastic nutrients Plastic unpreser	v meter and turbid n procedures follow rved inorganics (1 anics (250mL) L) preserved (500mL) L) s 60mL green/wh ved inorganics (200m preserved (300m	wed? Yes	rated in accordian	a with operating a	nenual and recorda	dī yes
(drin ranges) ield observations bservations dur	i ağ Nearby attiv	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpreser Preserved inorg Glass viais (40m glass amber uni Plastic nutrients Plastic unpreser Plastic nutrients Plastic unpreser	v metar and turbid n procedures folion rved inorganics (1 janics (250mL) 14) preserved (500mL) 14) stomL green/why ved inorganics (5 60mL jight green preserved (200m	wed? Yes	rated in accordian	a with operating a	nenual and recorda	dî yes
observations dur a Odours, sheen NO (	ing Samplings- a, turbidity, wate (BID) (OLOU	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpreser Preserved inorg Glass viais (40m glass amber uni Plastic nutrients Plastic unpreser Plastic nutrients Plastic unpreser	v meter and turbid n procedures follow rved inorganics (1 anics (250mL) L) preserved (500mL) L) s 60mL green/wh ved inorganics (200m preserved (300m	wed? Yes	rated in accordian	a with operating a	nenual and recorda	dî yes
Deservations dur a Cours, sheet NO Cours, sheet NO C NO C NO C	ing Samplings- a, turbidity, wate (BID) (OLOU)	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpreser Preserved inorg Glass viais (40m glass amber uni Plastic nutrients Plastic unpreser Plastic nutrients Plastic unpreser	v meter and turbid n procedures follow rved inorganics (1 anics (250mL) L) preserved (500mL) L) s 60mL green/wh ved inorganics (200m preserved (300m	wed? Yes	rated in accordan	a with operating a	nenual and recorda	dī yes
Abservations dur a Odours, sheen TUK NO ( NO	ing Sampling:- a, turbidity, wate (B/()) (O/O/O/O (UVOLUMES:- casing: drilled:	Let. weather	<10em	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpresen Preserved Inorg Glass amber uny Plastic nutrients Plastic nutrients Plastic nutrients Plastic unpresen Plastic unpresen Plastic unpresent Plastic	v meter and turbid n procedures follow rved inorganics (1 anics (250mL) L) preserved (500mL) L) s 60mL green/wh ved inorganics (200m preserved (300m	wed? Yes	rated in accordan	a with operating a	nenual and recorda	dī yes
Abservations dur Constructions	ing Sampling:- a, turbidity, wate (B/()) (O/O/O/O (O/O/O (U/O/U/MES:- casing: drilled: ing only.	Let. weather	<100m	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpresent Preserved Inong Glass vials (40m Glass amber unp Plastic nutrients Slass amber unpresent Plastic unpresent Plastic unpresent Plastic unpresent Plastic unpresent * DES-GNATES	vinetar and turbid norocedures folion ved inorganics (1 anics (250mL) ki) preserved (500mL) ki) somu green/wh ved inorganics (3 SAMPLES FILTER ved inorganics (3 SAMPLES FILTER	wed? Yes  1()  1()  1()  1(e  500mL)  n  1)  250mL)  ED IN FIELD)  0.00 L per metre	rated in accordan	a with operating a	nenual and recorda	dī yes
Abservations dur a Cours, sheet Cours, she	ing Samplings- a, turbidity, wate (BID) (OLOU) (OLOU) (UVOLUMES:- casing: drilled: ing only I-bole	r colour e	<10cm	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpresen Preserved inorg Glass vials (40m Glass vials (40m Glass vials (40m Glass vials (40m Glass amber unpresen Plastic unpresen * DESIGNATES TUTT tim tim tig (4L) tig (4L)	v metar and turbid n procedures folion ved inorganics (1 ianics (250mL) 14) preserved (500mL) 14) preserved (500mL) 14) 60mL green/wh ved inorganics (3 560mL ight green preserved (200m ved inorganics (2 5A/MPLES FILTER	wed? Yes  1()  1()  1()  1()  1()  2500mL)  1  250mL)  ED IN FIELD)  0.00 L per metre  0.00 L per metre	rated in accordan	a with operating a	nenual and recorda	dî yes
Intervations dures Intervations dures Interv	ing Sampling:- a, turbidity, wate (B/()) (O/O/O/O (O/O/O (U/O/U/MES:- casing: drilled: ing only.	r colour C	<100m	Has water quality Decontamination Samples Taken Metals Plastic * Plastic unpresen Preserved inong Blass viais (40m glass viais (40m glass viais (40m glass viais (40m glassic unpresen Plastic unpresen Plastic unpresen * DESIGNATES * DESIGNATES	v meter and turbid n procedures folion rved inorganics (1 anics (250mL) L) preserved (300m ved inorganics (1 560mL ight green preserved (300m ved inorganics (3 SA/MPLES FILTER	wed? Yes  1()  1()  1()  1(e  500mL)  n  1)  250mL)  ED IN FIELD)  0.00 L per metre	rated in accordan	a with operating a	nenual and recorda	dî yes

22-265

GREENCAP
Bladin Point
Groundwater Sampling Record



roject: ocation:	Agnes Water, Q	ore Installation ar Id	nd sampling	-	Date: 20~	14p4( 6) Pers	sonal informati	0	
STP 1	WELL DETAILS Well depth: Well diameter Casing type: Initial water leve	15.36 50m	7	Water meter Turbidity Meter	Peristaltic (low flow	w]	SEC# YSI# PRO	+ /	
Time Amount pur	ged Cumulative	Wats+Level	Temperature	DO	Sp. Conductivity	Salinity	рH	ORP	Turbidity
41	purzed (L)	2.74	00 01	0-335	3843	PSU	6.60	17.2	NTU
853 2	4	077	251	0.30		100	6.60	35.5	10-10-00
857 2		2.30	01.0	A 1-1	3826	-	6.59		-
2701 5	5		240	0.6/	3302		0151	10.1	
	8	2.82	240	0.53	3793	-	0:58	41.2	-
0909 2	10	2.85	24.0	0.41,	3814	N=	6.58	2.8	-
	12	2.87	24.0	0-36	3788		6.58	-1.5	10000
0917 2	14	2.88	24.0	0.33	3797	The second secon	6.57	-3.5	-
0921 2	16	2.89	24.1	0.31	3786	+	6.57	-3.3	1
0925 2	13	2.90	24.1	0.30	3784	G	6.57	0.4	
	20	2.91	24.1	0.30	3794		6.57	2.3	-
0933 2	22	2.92	24.1	0-29	3775	-	6.57	3:5	-
0937 2	24	2.93	24.1	0.29	3774	-	6-56	5.0	-
0941 2	26	2.94	241	0.28	3775		6.56	6.0	-
2945 2	28	2.94	24.1	0.28	3778	-	6.56	6.2	-
THE REPORT OF THE REPORT OF THE REPORT OF THE APPROX OF THE PARTY OF	N/4 sctivities, weather	SAF	1PEE	ATA		4.10%	± 0,1	± 10mV	N/A
(biln renæs) éld observations: eg. Nearby r		SAF	IPEE -	A P		± 10%	±0,1		N/A
tid observations; eg. Nearby i baarvations during Samplin	attivities, weather	SAF	Decontamination Samples Taken		KERY ty meter been calibr		the with operating r	± 20mv	
oservations during Samplin Odours, sheens, turbidity, t	ertivities, weather	SAF	Decontamination	mater and turble!	KERY ty meter been calibr	ated in accordan	ide with operating r	± 20my	d∓ Yes
oservations during Samplin Odours, sheens, turbidity, t	ertivities, weather	SAF	Decontamination Samples Taken Metals Plastic*	mater and turblet procedures follow	ty meter been calibr	ated in accordan	ide with operating r	± 20my	d∓ Yes
oservations during Samplin Odours, sheens, turbidity, t	ertivities, weather	SAF	Decontamination Samples Taken Metals Plastic*	mater and turbldt procedures follow wed Inorganics (1	ty meter been calibr	ated in accordan	ide with operating r	± 20my	d∓ Yes
tid observations; eg. Nearby i baarvations during Samplin	ertivities, weather	SAF	Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg Slass viais (20m	mater and turblet procedures follow wed Inorganics (1 anics (250mL)	KERY ty meter been callbr ved? Yes	ated in accordan	ide with operating r	± 20my	d∓ Yes
eld observations: eg. Nearby / bservations during Samplin ; Odours, sheens, turbidity /	ertivities, weather	SAF	Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg Glass viais (40m Glass amber unp	mater and turblet procedures follow wed Inorganics (1 anics (250mL)	KERY ty meter been calls ved? Yes	ated in accordan	ide with operating r	± 20my	d∓ Yes
eld observations; eg. Nearby , bservations during Samplin g Odou's, sheens, turbidity ,	ertivities, weather	SAF	Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg Glass vials (40m Glass amber ung Plastic nutrients Plastic unpreser	ved Inorganica (I anics (250m)) I) foreserved (500m) 60mL green/whi ved Inorganics (5	ty meter been calibried by the second	ated in accordan	ide with operating r	± 20my	d† Yes
eld observations: eg. Nearby / bservations during Samplin ; Odours, sheens, turbidity /	ertivities, weather	SAF	Decontamination Samples Taken Metals Plastic * Plastic unpreser Preserved inorg Glass viats (40m Glass amber unpreser Plastic nutrients Plastic unpreser Plastic unpreser	ved Inorganics (I anics (250mL) Enserved (500mL) BilmL green/whi	ty meter been calibried? Yes	ated in accordan	ide with operating r	± 20my	d† Yes
eld observations: eg. Nearby , bservations during Samplin g Odours, sheens, turbidity ,	ertivities, weather	SAF	Decontamination Samples Taken Metals Plastic * Plastic unpreser Preserved inorg Glass viais (40m Glass amber ung Plastic nutrients Plastic nutrients Glass amber ung Plastic nutrients Plastic nutrients Plastic nutrients Plastic nutrients Plastic nutrients	ved Inorganica (I anics (250mL) J) procedures follow ved Inorganica (S anics (250mL) J) proceeder (500mL) d) proceeder (500mL) d) ved Inorganica (S 60mL light green	KERY ty meter been calibrived? Yes UI UI te COmUI 1 SomUI	ated in accordan	ide with operating r	± 20my	d∓ Yes

Field Technician #1



e contra c		Trility				Job No:		_		
Project:			ore installation a	nd sampling		Sampled b. ch4p4	4(6) Person	al informatic		
ocation		Agnes Water, C				Date: 200	1-202			
and the second s	-	WELL DETAILS			SAMPLING EQUIP		INC			
	N 1920	Well depth.	13.0	4 (m)		Peristaltic (low flow	a)	000#		
STP	2	Well diameter:	500		Water meter		<u></u>	YEN PRO .	/	
->(1	4	Casing sype	PVY		Turb/dity Meter			The		1000
	Amount ourged	Cumulative	the support of the local data in the local data is the local data in the local data	and the second se	Interphase probe.	the second se	m	IP.M		
Time	(L)	pursed (L)	Water Level	Temperature	DO	Sp. Conductivity	Satinity PSU	6H	CIRP	Furbidit
1024	2	0	4.83	24.2	0117	1188/	-	Units 125	86.3	NTU
1028	2	E.	1	24.2	2.11	11800	<u></u>	6.38		6 2025
and the second second		1	4.85	and the second se	2.04	11 828	-	6:37	82:5	-
1033	2	6	4.86	24.2	(*72	11783	~	6.38	79.2	-
1037	1	8	4.86	24.2	1.43	11750	1	6.37	80.3	-
1041	5	10	4.86	24.1	1.26.	11774	-	6.88	77.2	
1AUG	2	12	4.86	241	1.06	A COLORED TO A	-		72.5	1000
10119	3		and the second s	AT.	1.00	11855		638		_
1047	1	14	4.86	24.2	0.74	11726	-70	6.38	69.2	1000
1024		6	4.36	24.1	0.88	11870	TT	6.38	69.1	
1058	2	18	4-86	24.1	0.82	11857		6.37	67.7	-
1102	2	20	4.86	24.1	0.74	11885	-	6.38	68.5	-
1107	2	29	4.56	24.1	0.67	11017	~	6.38	68.7	12.00
1110	2	74	11 00/	OIL.I	0/0	1101		the second s	20 1	100
1. 7	5	51	4-86	FT 1	0.04	11307		6.38	6.9.6	3.7
109	6	20	4.86	24.1	0.58	1771		6.38	68.7	
1 them	1	28	4.86	24.1	A	1			100	1
	And a state of the	Course and the second	1. U.V.	671	5.21	11732	10.00	6.38	68.5	-
thin ranges)	a (Breadings ag, Nearby et the	N/A	Drawdown c30cm	SAMP	C C	442924	± 10%	6*38 ±0,1	± 10my	N/A
thin ranges)		N/A	Drewdown		C C	11000	1947 - 20		Part April	and a state of the
thin ranges)		N/A	Drawdown c10cm	SAMP	reter and turbidity	meter been calibra	± 10%	± 0,1	± 10my	N/A
thin ranges) rid observations rid observations	ag, Nearby activ	N/A ties, weather	Drawcown c10cm	SATTIP	reter and turbidity	meter been calibra	± 10%	± 0,1	± 10my	N/A
thin ranges) id observations of observations scervations duri Odours, sheets	ng Semplings- , turbidity, wate	N/A ties, weather	Brawdown c10cm	SATTIN As water quality in Decontamination p Samples Taken	reter and turbidity	meter been calibra	± 10%	± 0,1	± 10my	N/4
thin ranges) id observations of observations scervations duri Odours, sheets	ng Semplings- , turbidity, wate	N/A ties, weather	Brawdown c10cm	Ast water quality in Decontamination p Samples Taken Metals Plastic*	reter and turbidity	meter bien calibrat	± 10%	± 0,1	± 10my	N/A
thin ranges) id observations of observations scervations duri Odours, sheets	ng Semplings- , turbidity, wate	N/A ties, weather	Brawdown c10cm	SATTIN As water quality in Decontamination p Samples Taken	reter and turbidity rocedures followes	meter bien calibrat	± 10%	± 0,1	± 10my	N/A
thin ranges) id observations id observations servations duri Odours, sheets	ng Semplings- , turbidity, wate	N/A ties, weather	Brawdown c10cm	SAMPLES As water quality in Decontamination p Samples Taken Metals Plastic* Mastic unpreserve Preserved Inorgan Stass vials (40mL)	reter and turbidity rocedures followers id inorganics (1L) ics (250mL)	meter bien calibrat	± 10%	± 0,1	± 10my	N/A
thin ranges) id observations id observations servations duri Odours, sheets	ng Semplings- , turbidity, wate	N/A ties, weather	Drawdown c10cm	As water quality in Decontamination p Samples Taken Metals Plastic* Peserved Inorgan Stass vials (40mL) Plass amber unpre-	inter and turbidity rocedures followes id inorganics (1() its (250ml)	meter been calibrat g <sup>2</sup> Yes	± 10%	± 0,1	± 10my	N/A
thin ranges) id observations id observations servations duri Odours, sheens	ng Semplings- , turbidity, wate	N/A ties, weather	Drawdown c10cm	Ass water quality in Decontamination p Samples Taken Metals Plastic* Plastic unpreserve Plasts vials (40mi) Plasts amber unpre- liastic unpreserve Plastic unpreserve	ed inorganics (1L) isserved (500mL) Dirtugreen/white d inorganics (200mL)	méter bien calibrai d <sup>2</sup> Yés	± 10%	± 0,1	± 10my	N/A
thin ranges) id observations id observations servations duri Odours, sheeps	ng Semplings- , turbidity, wate	N/A ties, weather	Drawdown c10cm	Aas water quality in Decontamination p Samples Taken Metals Plastic* Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve	id inorganics (1L) isserved (500mL) Circl green/white id inorganics (S00 Circl green/white id inorganics (S00 Circl green/white	méter bien calibrai d <sup>2</sup> Yés	± 10%	± 0,1	± 10my	N/A
thin ranges) id observations id observations servations duri Odours, sheeps	ng Semplings- , turbidity, wate	N/A ties, weather	Drawdown c10cm	Aas water quality in Decontamination p Contamination p Contami	interest and turbidity rocedures followers id inorganics (11) its (250mt) control (500mt) control (500mt) control (100mt) reserved (100mt)	meter bien calibrat d <sup>2</sup> Yés	± 10%	± 0,1	± 10my	N/4
thin ranges) id observations id observations servations duri Odours, sheets	ng Semplings- , turbidity, wate	N/A ties, weather	Brawdown c10cm	As water quality in Decontamination p Samples Taken Metals Plastic* Plastic unpreserve Plastic nutrients 6 Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve	interest and turbidity rocedures followers id inorganics (11) its (250mL) served (500mL) DinLingshight green served (100mL) d (norganics (250	meter bien calibrat d <sup>3</sup> Yes	± 10%	± 0,1	± 10my	N/A
Ithin ranges) rid observations bservations duri 1 Odours, sheets N.O. CO N.O. 07 N.O. 07 N.O. VIS	ng Semplings- turbidity, wate LOUR IBLE TU	N/A ties, weather	Brawdown c10cm	Aas water quality in Decontamination p Contamination p Contami	interest and turbidity rocedures followers id inorganics (11) its (250mL) served (500mL) DinLingshight green served (100mL) d (norganics (250	meter bien calibrat d <sup>3</sup> Yes	± 10%	± 0,1	± 10my	N/4
ithin ranges) eld observations bservations duri L Odours, sheets	ng Semplings- turbidity, wate LOUR IBLE TU	N/A ties, weather	Drawdown c10cm	As water quality in Decontamination p Samples Taken Metals Plastic* Plastic unpreserve Plastic nutrients 6 Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve	interest and turbidity rocedures followers id inorganics (11) its (250mL) served (500mL) DinLingshight green served (100mL) d (norganics (250	meter bien calibrat d <sup>3</sup> Yes	± 10%	± 0,1	± 10my	N/4
Ithin ranges) eld observations bservations duri L Odours, sheets N.O. CO N.O. OT N.O. VLS DNITOBING WEL ameter of wells c ameter of hole d	ng Sempling: turbidity wate たのした IBUE Tro IBUE Tro L VOLUMES:- asing: Iniled:	N/A ties, weather	Drawdown c10cm	SAMPLES	interest and turbidity rocedures followers id inorganics (11) its (250mL) served (500mL) DinLingshight green served (100mL) d (norganics (250	meter bien calibrat d <sup>3</sup> Yes	± 10%	± 0,1	± 10my	N/4
Ithin ranges) rid observations observations duri 1. Odours, sheets N.O. CO N.O. OT N.O. VIS N.O. VIS ONITORING WEL ameter of wells c ameter of hole d Volume of casis	ing Semplings- turbidity wate LOUR IBLE TO IBLE TO L VOLUMES:- asing: frilled: ng only	N/A ties, weather	Drawdown c10cm	As water quality in Recontamination p Samples Taken Metals Plastic* Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic nutrients 6 Plastic unpreserve Plastic unpreserve P	inter and turbidity rocadures foliower id inorganics (1L) ics (250mL) isserved (500mL) imit green/white d inorganics (500 cmillight green isserved (100mL) d inorganics (250 MPLES FILTERED	meter bien calibra d <sup>2</sup> Yas imL} IN FIEIDJ	± 10%	± 0,1	± 10my	N/4
Infinitions duri ind observations asservations duri Doors, sheens NO CO NO OT NO VIS DONITORING WEL Inter of well c inter of well c inter of well c inter of well c inter of hold Volume of drill	ing Semplings- turbidity wate LOUR IBLE TO IBLE TO L VOLUMES:- asing: frilled: ng only	N/A lies, weather	Drawdown <10cm	SAMPLES	interer and turbidity rocedures followers id inorganics (11) its (250mL) its (250mL) its (250mL) its (250mL) its (250mL) its (250mL) its followers d inorganics (250 MPLES FILTERED 0.00 0.00	meter bien calibra d <sup>2</sup> Yes imL1 imL1 iN FIELD1 D sper metre D sper metre	± 10%	± 0,1	± 10my	N/A
thin ranges) rid observations during observations NO CO NO OT NO VIS NO VIS NO VIS Observations during Distributions of a NO VIS	ing Semplings- turbidity, wate LOUR IBLE TO IBLE TO IBLE TO IBLE TO IBLE TO Inited: ng only -hale	n/A ties, weather r.colour A2Bi D / T	Drawdown c10cm	SAMPLES As water quality in Decontamination p Samples Taken Metals Plastic* Mastic unpreserve Preserved inorgan Slass vials (40mL) Slass amber unpre- Plastic nutrients 5 Mastic unpreserve Plastic nutrients 5 Mastic unpreserve Mastic unpreserve Assic unpreserve Assic unpreserve Designation of the second static unpreserve Assic unpreser	inter and turbidity rocedures followers id inorganics (11) its (250mL) eserved (500mL) 0mL ight green eserved (100mL) d inorganics (250 MPLES FILTERED 0.00 0.00 0.00	meter bien calibra d <sup>2</sup> Yas imL} IN FIEIDJ	± 10%	± 0,1	± 10my	N/4

Field Technician #1



Client: Projecti Location:	Trility Groundwater b Agnes Water, (	ore installation a	nd sampling		Job No: Sampled by: Date: 20 -		sonal informatic	or and the second se	
97/1	WELL DETAILS Well depth: Well diameter Casing type:	1.202	<u>m</u>	Water meter Turbidity Meter	PMENT Peristaltic   ow flo		SEON JO YSIN PRO -	+ ✓	
Amount	fhitial water leve	Water Level	Temperature	Interphase probe	Sp. Conductivity	Salinity	IP# DH	ORP	Turbidity
LineIL	punted (L)	(m)		Nisat	u\$/sm	PSU	Units	mV	NTU
1158 2	enter terres	0-51	21.7	2.47	37819	-	5.82	22.7	
1207 2	- 4	0.51	21.8	2.47	378:3		5.72	130	-
1206 2	- 6	0.51	21.3	2.47	378.0	-	5.72	132	-
1210 2		0.51	21.8	2:45	378	-	5.73	133	
1214 3	2 10	0.51	21.8	2.48	377		5.75	133	-
		SAN	PLES	TAKE	26				
						.0,			
					C				
					.6				1911
				6	N° C				
							-		1/10
CONTRACT OF A DESCRIPTION OF A DESCRIPTI									
thin ranges)	N/A	Drewsown <10cm	210%	GER C	1288	z 10%	20.1	z 10my	N/A
thin ranges)	N/A	and the second se	210%			z 10%	10.1	2 10mv	N/A
thin ranges)	N/A	<10cm	Hes water quality		y meter boen calibra		±0.1		
chin ranges) rid observations) eg. Neart servations during Sampl	N/4 y activities, weather	<idem< td=""><td>Hes water quality</td><td>meter and turbidity</td><td>y meter boen calibra</td><td></td><td></td><td>anual and recorde</td><td></td></idem<>	Hes water quality	meter and turbidity	y meter boen calibra			anual and recorde	
chin ranges) rid observations) eg. Neari servations during Sampi Odcure, sheens, turbidit	N/4 y activities, weather	<idem< td=""><td>Has water quality Decontamination Samples Taken</td><td>meter and turbidity</td><td>y meter boen calibra</td><td>thed in accordan</td><td>ce with operating m</td><td>anual and recorde</td><td>d² Yes</td></idem<>	Has water quality Decontamination Samples Taken	meter and turbidity	y meter boen calibra	thed in accordan	ce with operating m	anual and recorde	d² Yes
chin ranges) rid observations) eg. Neari servations during Sampi Odcure, sheens, turbidit	N/4 y activities, weather	<10cm	Has water quality Decontamination Samples Taken Meta's Plastic*	meter and turbidity	y meter boen calibra	thed in accordan	ce with operating m	anual and recorde	d² Yes
chin ranges) eld observational eg. Nearl bservations during Samp Odcure, sheens, turbidit TURB NO COLC	ing:- v water colour l PCR	410cm	Has' water quality Decontamination / Samples Taken Meta's Plastic* Plastic unpreserved inorga	meter and turblath procedures follows red Inorganies (11 nics (250mL)	y meter boen calibra	thed in accordan	ce with operating m	anual and recorde	d° Yes
chin ranges) eld observational eg. Nearl bservations during Samp Odcure, sheens, turbidit TURB NO COLC	ing:- v water colour l PCR	410em	Has water quality Decontamination ; Samples Taken Meta's Plastic* Plastic unpreserve Preserved inorga Glass viais (40m)	meter and turblath procedures follows red Inorganies (11 nics (250mL)	r meter boen calibra #7 Yes	thed in accordan	ce with operating m	anual and recorde	d² Yes
iblin ranges) eld observations; eg. Neart bservations during Sampl c Odcure, sheens, turbidit	ing:- v water colour l PCR	<10cm	Has water quality Decontamination ; Samples Taken Meta's Plastic* Plastic unpreserve Preserved imorga Glass viais (42mi) Glass amber unp Plastic nutrients	red Inorganies (11 nice (500mL) /reserved (500mL) 50mL green/white	y meter boen calibra	thed in accordan	ce with operating m	anual and recorde	d² Yes
ithin ranges) eid observations( eg. Neart bservations during Samp c Odours, sheens, turbidit TURB NO COLC	ing:- v water colour l PCR	<10cm	Has water quality Decontamination ; Samples Taken Meta's Plastic* Plastic unpreserve Preserved inorga Glass amber unp Slass amber unp Fisatic unpreserve	reter and turblats procedures follows reter inorganics (1L nics (250mL) / reterved (500mL) / / // // // // // // // // // // // /	y meter boen calibra	thed in accordan	ce with operating m	anual and recorde	d° Yes
ichin ranges) eld observations ( eg. Nearl bservations during Samp : Odcure, sheens, turbidit TURB NO COLC	ing:- v water colour l PCR	410cm	Has water quality Decontamination / Samples Taken Meta's Plastic* Plastic unpreserve Preserved inorga Glass viais (40mi Glass amber unp Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve Plastic unpreserve	red Inorganics (11 nics (250mL) ) /#served (500mL) 50mL green/white 6dfmi, light green /reserved (200mL)	y meter boen calibra es? Yes	thed in accordan	ce with operating m	anual and recorde	d° Yes
ithin ranges) eid observations( eg. Neart bservations during Samp c Odours, sheens, turbidit TURB NO COLC	ing:- v water colour l PCR	<10cm	Has weter quality Decontamination Samples Taken Meta's Plastic* Plastic unpreserved inorga Glass viais (40mi) Glass amber unp Plastic unpreserved Plastic unpreserved Plastic unpreserved Plastic unpreserved Plastic unpreserved	meter and turbidity procedures followe end inorganics (11, nics (250mL) ) form, green/white horganics (500 60mL light green	y meter boen calibra es? Yes } } cmL) CmL)	thed in accordan	ce with operating m	anual and recorde	d° Yes
ithin ranges) eld observations (eg. Neard bservations during Sampl c Odcure, sheens, turbidit TURB NO COLO NO ODOU ONITORING WELL VOLUN ameter of well casing:	ing:- / water colour I D / R / R	<idem< td=""><td>Has water quality Decontamination ; Samples Taken Metais Plastic* Plastic unpreserve Preserved inorga Glass amber unp Plastic nutrients Fiastic nutrients Fiastic nutrients Fiastic nutrients Glass amber unp Plastic nutrients Glass amber unp Plastic nutrients ; Glass amber unp Plastic nutrients ; Glass amber unp</td><td>red Inorganics (11 nics (250mL) ) reserved (500mL) ) cesting green/white reserved (200mL) reserved (200mL) reserved (200mL) reserved (200mL) reserved (200mL) reserved (200mL) reserved (200mL)</td><td>y meter boen calibra es? Yes } } cmL) CmL)</td><td>thed in accordan</td><td>ce with operating m</td><td>anual and recorde</td><td>d² Yes</td></idem<>	Has water quality Decontamination ; Samples Taken Metais Plastic* Plastic unpreserve Preserved inorga Glass amber unp Plastic nutrients Fiastic nutrients Fiastic nutrients Fiastic nutrients Glass amber unp Plastic nutrients Glass amber unp Plastic nutrients ; Glass amber unp Plastic nutrients ; Glass amber unp	red Inorganics (11 nics (250mL) ) reserved (500mL) ) cesting green/white reserved (200mL) reserved (200mL) reserved (200mL) reserved (200mL) reserved (200mL) reserved (200mL) reserved (200mL)	y meter boen calibra es? Yes } } cmL) CmL)	thed in accordan	ce with operating m	anual and recorde	d² Yes
NO ODOU ONITORING WELL VOLUN ameter of well casing: ameter of hole drilled:	ing:- / water colour I D / R / R	<10cm	Has water quality Decontamination ( Samples Taken Metais Plastic* Plastic unpreserv Preserved inorga Glass amber ungi Plastic unpreserv Plastic unpreserv Plastic unpreserv Plastic unpreserv Plastic unpreserv Plastic unpreserv Plastic unpreserv Plastic unpreserv (* DESIGNATES Si	reterved (100mL) ed Inorganics (1L nics (250mL) ) reterved (500mL) sed Inorganics (50 60mL light green/white ed Inorganics (50 60mL light green/white ed Inorganics (50 60mL light green/white set Inorganics (10 60mL light green/white set Inorganics (10 60 mL light green/white set Inorgan	y meter boen calibra IS <sup>7</sup> Yes OmL) OmL) IN FIELD	thed in accordan	ce with operating m	anual and recorde	d² Yes
Ithin ranges) eid observationslieg. Near bservations during Sampl p. Odcure, sheens, turbidite TD-RB NO COLO NO COLO NO COLO NO COLO ONITORING WELL VOLUN ameter of well casing. ameter of hole drilled: ) Volume of drill-hole	ing:- / water colour I D V R IR IES:-	<idem< td=""><td>Has water quality Decontamination ( Samples Taken Meta's Plastic* Plastic unpreserved inorga Glass viais (40mi) Glass amber ungo Plastic unpreserve Plastic unpreserve Plastic unpreserve "DeSigNATES S mm mm m3 (kL)</td><td>ed Inorganics (11. nics (250mL) ) reserved (500mL) ) comparises (250mL) ) comparises (250mL) ) comparises (250mL) comparises (250mL) co</td><td>y meter boen calibra es? Yes } } cmL) CmL)</td><td>thed in accordan</td><td>ce with operating m</td><td>anual and recorde</td><td>d° Yes</td></idem<>	Has water quality Decontamination ( Samples Taken Meta's Plastic* Plastic unpreserved inorga Glass viais (40mi) Glass amber ungo Plastic unpreserve Plastic unpreserve Plastic unpreserve "DeSigNATES S mm mm m3 (kL)	ed Inorganics (11. nics (250mL) ) reserved (500mL) ) comparises (250mL) ) comparises (250mL) ) comparises (250mL) comparises (250mL) co	y meter boen calibra es? Yes } } cmL) CmL)	thed in accordan	ce with operating m	anual and recorde	d° Yes
Initia ranges) eid observationsi eg. Neart beervations during Sampl c doure, sheens, turbidit TLRB NO COLO NO COLO NO COLO NO COLO NO COLO	ny activities, weather	<10cm	Has' water quality Decontamination ; Samples Taken Meta's Plastic* Plastic unpreserv Preserved inorga Glass viais (40m) Blastic unpreserv Plastic unpreserv Plastic unpreserv (* DESIGNATES S mm mim m3 (kL) m3 (kL) m3 (kL)	red Inorganics (11 nics (250mL) / /#served (500mL) / /#served (500mL) / / / / / / / / / / / / / / / / / / /	y meter been calibra HS7 Yes CmL) CmL) CmL) SIN FIELD)	thed in accordan	ce with operating m	anual and recorde	d° Yes

Field Technician #1



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Level 1 / 381 MacArthur Avenue Hamilton QLD 4007 Australia

# April 2021 Quarterly Report Trility Pty Ltd

### Integrated Water Treatment Plant and Wastewater Treatment

Plant, Agnes Water

Appendix B: Results Summary Table and QA/QC

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Adelaide | Auckland | Brisbane | Canberra | Darwin | Melbourne | Newcastle | Perth | Sydney | Wollongong

					-																						
					Field	6						Inorgani	cs								Metals						
			글 편 디	රු කිදි Electrical Conductivity (EC)	玉 pH_Units	3 Oxidation Reduction Potential (ORP)	n° Temperature	a 7/ Ammonia as N	chloride <sup>ma</sup>	Steldahl Nitrogen Total	ම් Nitrate (as N)	an Nitrite (as N)	글 전 구	Ba D'A D'Aides of Nitrogen	a Total Phosphorus as P	a SO4 Sulphate as SO4	H®/r Aluminium	며 (Filtered)	円 Arsenic	편 고영	Boron MB/T	Cadmium	HA 기치 기치	ଅନ୍ମ ମୁମ୍		Cobait Γ/8π	五 万 万 人
		LOR		μογεπι	pri_onito			0.01	1	0.1	0.01	0.01	0.1	0.1	0.01	1	10	10	1	1	50	0.1	0.1	1	1	1	1
		Trigger Criteria	20% change from background	20% change from background	No change from background			20% change from background	20% change from background		20% change from background		20% change from background		20% change from	change from ckgroun d	55	55	13	13	No change from backgroun d	0.2	0.2	1	1	1	1
Bore_ID		nt Lab_ReportNumber	D0	EC	рН (		temp	Am	Cl	T_N_Kj	N_NO3	N_NO2	2 T_N	NOX	-	5_SO4	Al	Al_F	As	As_F	Во	Cd	Cd_F	Chr_III_\	/I_Chr_III_VI	LF Co	Co_F
97-01 97-01	Dec-16 21/12/2016 WwTP	EB1630075	1.45			-43	25.9	0.02		0.		5 <0.01	0.6			23	2860	3	1 <		<50	<0.1	<0.1		2 <1	-1	3 2
97-01 97-01	Jun-17 22/06/2017 WwTP Dec-17 13/12/2017 WwTP	EB1712820003 EB1726592	0.26			161.4 75	20.2 25	<0.01 0.13		<0.1 0.	<0.01 4 <0.01	<0.01 <0.01		<0.01 <0.01	<0.01 <0.01	8	160 < 1490	:10 < 50 <		:1 :1	<50 <50	<0.1 <0.1	<0.1 <0.1	<1 <1	<1 <1	<1 <1	<1 <1
97-01	Mar-18 21/03/2018 WwTP	EB1807282	1.42	510	6.42	360.1	24.2	0.04	117	0.	2 0.02	2 <0.01	0.2	0.02	<0.01	10	840	30 <	1 <	1	<50	<0.1	<0.1	<1	<1	<1	<1
97-01 97-01	Jun-18 6/06/2018 WwTP Sep-20 22/09/2020 WwTP	EB1813834 EB2025060	0.42		6.32 5.87	197.5 209.8	19.7 20.5	0.02 0.01	189 161	0. 0.1	2 <0.01 0.24	<0.01 <0.01		<0.01 0.24	<0.04	21 22	220 < 680	:10 < 10 <	1 < <1	:1 <1	<50 <50	<0.1 <0.1	<0.1 <0.1	<1 <1.0	<1 2	<1 <1.0	<1 <1
97-01	Apr-21 20/04/2021 WwTP	EB2110810	2.48	377	5.75	133	21.8	0.52	101	0.	8 0.02	2 <0.01	0.8	0.02	0.04	8	1090	1540 <	1 <	1	<50	<0.1	<0.1	<1	<1	<1	<1
DESAL 1 DESAL 1	Sep-16 27/09/2016 IWTP Dec-16 14/12/2016 IWTP	EB1623330 EB1629480	1.35 0.44		4.31 4.23	-135 -123.9	22.9 24.5	<0.01 0.14	24 34	0. 0.		3 <0.01 3 <0.01	1.1 0.8				1030 1030	450 < 640 <		:1 :1	<50 <50	<0.1 <0.1	<0.1 <0.1		1 <1 1 <1	<1 <1	<1 <1
DESAL 1 DESAL 1	Mar-17 8/03/2017 IWTP	EB1704526	0.44			254	24.3	0.14			4 <0.01	<0.01		<0.01	0.04 <3		2060	870 <		:1	<50	<0.1	<0.1		2 <1	<1	<1
DESAL 1	Jun-17 21/06/2017 IWTP	EB1712688001	0.38		4.59	176.2	24.4	0.15				L <0.01	1			16	940	400 <			<50	<0.1	<0.1			1 <1	<1
DESAL 1 DESAL 1	Sep-17 27/09/2017 IWTP Dec-17 14/12/2017 IWTP	EB1719944 ET1701842	1.38 1.15		6.24 5.03	60.6 -116.2	23.5 24.9	0.03				3 <0.01 <0.01	0.3	0.08 <0.01	0.03	2	280 660	40 < 390 <		:1 :1		0 <0.1 0 <0.1	<0.1 <0.1	<1 <1	<1 <1	<1 <1	<1 <1
DESAL 1	Mar-18 22/03/2018 IWTP	EB1807442	0.05			-50.2	25.7	0.11		1.		2 <0.01	1.1				800	500	1 <			0 < 0.1	<0.1	<1	<1	<1	<1
DESAL 1	Jun-18 4/06/2018 IWTP	EB1813546	0.11			-22.6	24.7	0.05		1.		4 <0.01	2.1				1070	820 <		1		0 < 0.1	<0.1	<1	<1	<1	<1
DESAL 1 DESAL 1	Oct-18 8/10/2018 IWTP Dec-18 18/12/2018 IWTP	EB1824231 EB1831182	0.15			79.9 231.1	23.7 25	0.14 0.11		0. 0.		7 <0.01 3 <0.01	1.6	0.17			670 840	410 < 560 <		:1 :1	<50 <50	<0.1 <0.1	<0.1 <0.1	<1	<1 2 <1	<1 <1	<1 <1
DESAL 1	Mar-19 25/03/2019 IWTP	EB1907649	0.08		4.05	360	26.4	0.16		0.	9 0.76	5 <0.01	1.7	0.76			1090	420 <		1.0	<50	<0.1	<0.1		2 <1.0	<1.0	<1.0
DESAL 1 DESAL 1	Jun-19 24/06/2019 IWTP Sep-19 16/09/2019 IWTP	EB1916325 EB1924392	0.34 0.13		4.05 3.92	233 306	24.5 32.4	0.14 0.15		1. 0.		5 <0.01 L <0.01	0.8	0.15 0.11		5	950 420	580 < 420 <		:1.0 :1.0	<50	<0.1 0 <0.1	<0.1 <0.1	<1.0	2 <1.0 <1.0	<1.0 <1.0	<1.0 <1.0
DESAL 1	Dec-19 16/12/2019 IWTP	EB1933892	0.88			248	25.2	0.12				2 <0.01	0.8			.0	560	470 <		1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
DESAL 1 DESAL 1	Apr-20 15/04/2020 IWTP	EB2010399	0.32			172.4	26.3	0.1	72 77			5 <0.01	2		< 0.05 < 5.		590	480 <		1.0	<50 <50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0 <1.0
DESAL 1 DESAL 1	Jun-20 22/06/2020 IWTP Sep-20 24/09/2020 IWTP	EB2016548 EB2025327	0.18			124.6	24.5 23.7	0.12 0.13			1 0.3 6 <0.05	3 <0.05 <0.05	1.4 1.6		0.01 <5		620 1020	610 < 980	2	0.001: <1	<50 <50	<0.1 <0.1	<0.1 <0.1	<1.0 <1	<1.0 1	<1.0 <1.0	<1.0
DESAL 1	Dec-20 9/12/2020 IWTP	EB2032757	0.76	394.8	4.16	151.8	24.7	0.12	97		1 <0.05	<0.05	1	<0.01	<0.05 <5		850	840 <		1	<50	<0.1	<0.1		2 <1	<1	<1
DESAL 1 DESAL 2	Apr-21 22/04/2021 IWTP Sep-16 27/09/2016 IWTP	EB2111143 EB1623330	0.13		4.1 2.27	-134.3	25.9	0.08	<b>116</b> 31	1.		<b>3</b> <0.05 5 <0.01	2.2	0.53	<0.05 <5 0.07 <1	_	1020 1160	1040 < 400 <		:1	<50	0 <0.1 <0.1	<0.1		4 <1	1 <1 <1	<1 <1
DESAL 2	Dec-16 14/12/2016 IWTP	EB1629480	0.61			-121.9	23.5	0.1		0.		4 <0.01	1	0.15			1700	510 <		:1	<50	<0.1	<0.1		3 <1	<1	<1
DESAL 2	Mar-17 8/03/2017 IWTP	EB1704526	0.12			286	24.5	0.1		3.		3 <0.01	3.6				980	340 <		1	<50	<0.1	<0.1		3 <1	<1	<1
DESAL 2 DESAL 2	Jun-17 21/06/2017 IWTP Sep-17 27/09/2017 IWTP	EB1712688002 EB1719944	0.83			9.8 38.9	23.6 23.2	0.1 0.1		1. 0.		2 <0.01 3 <0.05	1.1 0.9	0.02			950 890	490 < 350 <		:1 :1	<50 <50	<0.1 <0.1	<0.1 <0.1		2 <1 2 <1	<1 <1	<1 <1
DESAL 2	Dec-17 14/12/2017 IWTP	ET1701842	1.14	168	4.21	-18	23.7	0.24	40	1.	1 <0.01	<0.01	1.1	<0.01	0.04	3	1100	330 <	1 <	:1	<50	<0.1	<0.1		1 <1	<1	<1
DESAL 2	Mar-18 22/03/2018 IWTP	EB1807442	0.05			-28.1	24.5	0.11		1.		4 <0.01	1.7				740	450	1 <		<50	<0.1	<0.1		2 <1	<1	<1
DESAL 2 DESAL 2	Jun-18 4/06/2018 IWTP Oct-18 8/10/2018 IWTP	EB1813546 EB1824231	0.05 0.93			211.8 143.6	23.9 23.1	0.09 0.14		0. 1.		5 <0.01 L <0.01	1.5 3.5				580 820	500 < 650 <		:1 :1	<50 <50	<0.1 <0.1	<0.1 <0.1	<1	1 <1 <1	<1 <1	<1 <1
DESAL 2	Dec-18 18/12/2018 IWTP	EB1831182	1.26		4.07	381	23.8	0.11	33	0.	7 0.82	2 <0.01	1.5	0.82	0.01 <1		540	590 <		1	<50	<0.1	<0.1	<1	<1	<1	<1
DESAL 2 DESAL 2	Mar-19 25/03/2019 IWTP Jun-19 24/06/2019 IWTP	EB1907649 EB1916325	0.05			329.8 265.8	24.7 23.5	0.12 0.14		0. 0.		L <0.01 3 <0.01	1 0.9	0.21 0.03		2	500 520	430 < 400 <		:1.0 :1.0	<50 <50	<0.1 <0.1	<0.1 <0.1	<1.0	<1.0 1 <1.0	<1.0 <1.0	<1.0 <1.0
DESAL 2	Sep-19 16/09/2019 IWTP	EB1924392	0.23		3.6	334	23.5	0.14		0.		5 <0.01	1.2	0.55		1	350	370 <		:1.0		0 <0.1	<0.1	<1.0	<1.0	<1.0	<1.0
DESAL 2	Dec-19 16/12/2019 IWTP	EB1933892	0.98			292	23.9	0.08		1.		7 <0.01	1.3				510	450 <		1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
DESAL 2 DESAL 2	Apr-20 15/04/2020 IWTP Jun-20 22/06/2020 IWTP	EB2010399 EB2016548	0.31		3.92 4.3	180.6	24.8 23.8	0.1 0.15		1.	3 0.03 1 <0.05	3 <0.01 <0.05	1.3	0.03 <0.01	0.1	2	1350 620	560 < 590 <		:1.0 :0.001	<50 <50	<0.1 <0.1	<0.1 <0.1	<1.0	3 <1.0 <1.0	<1.0 <1.0	<1.0 <1.0
DESAL 2	Sep-20 24/09/2020 IWTP	EB2025327	0.13	220.2	4.61	29.9	22.9	0.17	53		9 <0.05	<0.05	0.9	<0.01	<0.05 <5		600	580	1	<1	<50	<0.1	<0.1		1 <1	<1.0	<1
DESAL 2 DESAL 2	Dec-20 9/12/2020 IWTP Apr-21 22/04/2021 IWTP	EB2032757 EB2111143	0.59 0.25		4.45 <b>4.09</b>	189.4 114	23.9 <b>24.5</b>	0.13 0.05		<0.5 0.		7 <0.05 9 <0.05	<0.5 1		<0.05 <5 0.14 <5		1550 <b>400</b>	530 < 360 <		:1 :1	<50 <50	<0.1 <0.1	<0.1 <0.1	<1	4 <1 <1	1 <1	1 <1 <1
DESAL 2	Sep-16 27/09/2016 IWTP	EB1623330	1.26			-56.1	24.3		24		4 < 0.01	<0.01		<0.1	0.14 <5		2920	540	3		3 <50	<0.1	<0.1		12		6 5
DESAL 3	Dec-16 14/12/2016 IWTP	EB1629480	1.24	183.3		-54.1		0.26			4 <0.01	< 0.01		< 0.01	0.19 <1		3090	460	4		2 <50	<0.1	<0.1	:	12		5 3
DESAL 3 DESAL 3	Mar-17 8/03/2017 IWTP Jun-17 21/06/2017 IWTP	EB1704526 EB1712688003	0.01			-154 124	27.3 25.9	0.29 0.38			3 <0.01 3 0.01	<0.01 L <0.01		<0.01 0.01	0.28 <1		2920 1180	540 420	2 2		2 <50 2 <50	<0.1 <0.1	<0.1 <0.1	-			3 2 2 2
DESAL 3	Sep-17 27/09/2017 IWTP	EB1719944	0	170	5.2	-111	25.2	0.33	47		3 <0.01	<0.01	1.3	<0.01	0.16 <1		1070	360	2		2 <50	<0.1	<0.1		5	1 2	2 2
DESAL 3 DESAL 3	Dec-17 14/12/2017 IWTP Mar-18 22/03/2018 IWTP	ET1701842 EB1807442	1.71 0.06			-125.4	26.2	0.41			1 <0.01 4 <0.01	<0.01 <0.01		<0.01 <0.01	0.1 <1	3	1160 1160	460	1 < 3			0 <0.1	<0.1 <0.1			1 3	3 2 2 2
DESAL 3 DESAL 3	Jun-18 4/06/2018 IWTP	EB1807442 EB1813546	0.05			-103.1 -119.7	27.6 26.3	0.36 0.3			4 <0.01 6 0.02			0.01	0.1		1160 1210	530 910	3		2 <50 2 <50	<0.1	<0.1 .1 <0.1				2 2 2
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		LOR	ja P Solved Oxygen (DO)	번 Blectrical Conductivity (EC) W	E pH_Units	A Oxidation Reduction Potential (OR		mg/L 0.01	<b>U</b> ,	100 1.0 Maw Nitrogen Total M Nitrate (as N)	Nitrite (as N)	mg(L 1.0 1.0	0.1 0.1	, Total Phosphorus as P ∭001	T B T T	1) 전체 12 Aluminium 10	01 기 名luminium (Filtered)	μg 1	다 형 Arsenic (Filtered)	юлод µg/L 50	cadmium μg/L 0.1	1.0 乙dmium (Filtered)	t 克 つ し し し し	다 F Chromium (III+VI) (Filtered)	Cobait T/81	t ਨਿੰ   
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		Trigger Criteria	20% change from background	20% change from background	from background			from	from background	20% chai from backgrou		from background		from background	from backgroun d	55	55	13	13	from backgroun d	0.2	0.2	1	1	1	1
Bore ID	Period Sample_Date Plan	t Lab_ReportNumber	DO	EC	рН (	ORP te	mp	Am	CI T	_N_Kj N_NO	3 N_NO2	2 T_N	NOX	T_P	\$_\$04	Al	AI F	As	As_F	Во	Cd	Cd_F	Chr III VI	Chr_III_VI_F	Co	Co_F
DESAL 3	Oct-18 8/10/2018 IWTP	EB1824231	0.79	200.1	4.86	-115.8	25	0.3	53	1 < 0.01	<0.01	1	<0.01	0.08	<1	970	600	2	1	<50	<0.1	<0.1	4	- 2	1	1
DESAL 3 DESAL 3	Dec-18 18/12/2018 IWTP	EB1831182	1.46 0.05		4.74 4.8	-130.6 -174.6	26.4 28	0.26 0.35	58 67	0.9 <0.05 1.1 <0.01	<0.01 <0.01		<0.05 <0.01	0.06		880 830	880 520	1	-		<0.1 <0.1	<0.1 <0.1	3		-	1 <1.0
DESAL 3 DESAL 3	Mar-19 25/03/2019 IWTP Jun-19 24/06/2019 IWTP	EB1907649 EB1916325	0.05	234.6	4.8	-174.6	28	0.35	51	1.1 < 0.01	<0.01		< 0.01	0.07		2420		2			<0.1	<0.1	10			<1.0
DESAL 3	Sep-19 16/09/2019 IWTP	EB1924392	0.15	222		-171.8	25	0.39	56	1.5 < 0.01	<0.01		<0.01	0.06		1030	800	1			<0.1	<0.1	4			<1.0
DESAL 3	Dec-19 16/12/2019 IWTP	EB1933892	1.51	208		-155	26.6	0.38	54	1.6 < 0.01	<0.01		<0.01	0.09		870	1040	2			<0.1	<0.1	3			<1.0
DESAL 3 DESAL 3	Apr-20 15/04/2020 IWTP Jun-20 22/06/2020 IWTP	EB2010399 EB2016548	0.44 0.34	219 202		-177.7	27.6 26.3	0.5 0.47	60 47	1.6 <0.01 1.2 <0.05	<0.01 <0.05		<0.01 <0.01	0.21 0.07		920 840		1 0.002	1 0.002		<0.1 <0.1	<0.1 <0.1	3			<1.0 <1.0
DESAL 3	Sep-20 24/09/2020 IWTP	EB2025327	0.34			117.5	20.3	0.47	54	1.2 <0.05	<0.05		<0.01	0.07		670	560	2	1	<50	<0.1	<0.1	3		<1.0	<1.0
DESAL 3	Dec-20 9/12/2020 IWTP	EB2032757	1.93	483.3		-31.1	26.3	0.75	148	0.8 < 0.01	<0.01		<0.01	<0.05	2	640	390	1			<0.1	<0.1		<1	1	-
DESAL 3	Apr-21 22/04/2021 IWTP	EB2111143	1.75	1772		-134	27.2	1.64	545	2.1 < 0.01	< 0.01		<0.01	0.05	55	300	300	0.001	0.001	100		<0.1	<1	1	1	1
STP 1 STP 1	Sep-16 28/09/2016 WwTP Dec-16 21/12/2016 WwTP	EB1623330 EB1630075	2.78			-24.3 -200.5	23.6 <0 24.3	0.01	1020 <0. 962	1 <0.01 0.1 <0.01	<0.01 <0.01		<0.1 <0.01	<0.01 0.02	91 98		<10 <10	2 1			<0.1 <0.1	<0.1 <0.1	<1 <1	<1 <1		<1 <1
STP 1	Mar-17 9/03/2017 WwTP	EB1704666	0.03			187.6	24.3	0.01	998 <0.		<0.01	<0.1	<0.01	0.05	94		<10	2		<50		2 <0.1	<1	<1		<1
STP 1	Jun-17 22/06/2017 WwTP	EB1712820001	1.1			9.3	23.4	0.01	955 <0.		<0.01		<0.01	0.1	100		<10	2			<0.1	<0.1	<1	<1		<1
STP 1 STP 1	Sep-17 28/09/2017 WwTP Dec-17 13/12/2017 WwTP	EB1720060 EB1726592	0.03 2.22		6.79 6.51	4.7 -17.6	23.6 24	0.02	1140 <0. 986	1 <0.01 0.1 <0.01	<0.01 <0.01		<0.01 <0.01	0.02	92 90		<10 <10	1			<0.1 <0.1	<0.1 <0.1	<1 <1	<1 <1		<1 <1
STP 1	Mar-18 21/03/2018 WwTP	EB1720332 EB1807282	0.15	4118	6.7	-17.0	24.3	0.01	975 <0.1		<0.01		<0.01	0.02	98		<10	1			<0.1	<0.1	<1	<1		<1
STP 1	Jun-18 6/06/2018 WwTP	EB1813834	0.14	4148		33.8	23.2	0.03	1040 < 0.	1 <0.01	<0.01		<0.01	0.02	105		<10	1			<0.1	<0.1	<1	<1		<1
STP 1	Oct-18 8/10/2018 WwTP	EB1824223	1.53	3475		-24.6	23.6	0.11	1050 < 0.1		01 < 0.01	<0.1	0.0		95		<10	1			< 0.1	<0.1	<1	<1		<1
STP 1 STP 1	Dec-18 20/12/2018 WwTP Mar-19 26/03/2019 WwTP	EB1831536 EB1907817	2.08	3812 3854	6.61 6.57	11.9 10.9	23.9 24.4	0.04	991 <0. 1060		<0.1 .04 <0.01	<0.1	<0.1	<0.1 4 0.02	93 99		<10 <10	1 <			<0.1 <0.1	<0.1 <0.1	<1 <1.0	<1 <1.0	<1 <1.0	<1 <1.0
STP 1	Jun-19 25/06/2019 WwTP	EB1916591	0.54	3919		7.6	23.2	0.01	997 <0.		<0.01	<0.1	<0.01	0.01	97		<10	1			<0.1	<0.1	<1.0			<1.0
STP 1	Sep-19 17/09/2019 WwTP	EB1924565	0.25	3848	6.68	10.7	23.5	0.05	1030 <0.		<0.1		<0.1	0.01	95		<10	1	1		<0.1	<0.1	<1.0			<1.0
STP 1 STP 1	Dec-19 17/12/2019 WwTP Apr-20 15/04/2020 WwTP	EB1934065 EB2010933	2.64	3648 3729	6.54 6.71	2.1 -16.7	24 24.1	0.05 0.25	1020 <0. 1020	1 <0.01 0.3 <0.01	<0.01 <0.01		<0.01 <0.01	0.01	95 95		<10 <10	1			<0.1 <0.1	<0.1 <0.1	<1.0 <1.0	<1.0 <1.0		<1.0 <1.0
STP 1	Jun-20 24/06/2020 WWTP	EB2010935 EB2016812	0.72		6.67	-10.7	24.1	0.23	1020	0.3 <0.01	<0.01	0.5			93		<10	1			<0.1	<0.1		<1.0		<1.0
STP 1	Sep-20 22/09/2020 WwTP	EB2025060	0.55	3844		7	23.6	<0.01	1050 ·	<0.1 <0.02	<0.01	<0.1	<0.01	0.02	94	<10	<10	1	1	<50	<0.1	<0.1	<1.0	2	<1.0	<1
STP1 STP 1	Dec-20 8/12/2020 WwTP Apr-21 20/04/2021 WwTP	EB2032617 EB2110810	1.09 0.28	3915 3780		-2.2 6.2	24 <b>24.1</b>	0.18	1060 1070	0.4 <0.01 0.2 <0.01	<0.01 <0.01		<0.01 <0.01	0.03 0.02	92 · <b>98</b> ·		<10 <10	1 < 1 <			<0.1 <0.1	<0.1 <0.1	<1 <1	<1 <1		<1 <1
STP 1 STP 2	Sep-16 28/09/2016 WwTP	EB2110810 FB1623330	0.28			-160.5	24.1		4160 <0.2		<0.01	<0.1	<0.01	0.02	373		<10	1 <	1		<0.1	<0.1	<1	<1	<1 2	
STP 2	Dec-16 21/12/2016 WwTP	EB1630075	0.04	11734	6.44	-121.3	25.9	0.03	4060 <0.		<0.01		<0.01	0.02	384		<10	1	1		<0.1	<0.1	<1	<1		<1
STP 2	Mar-17 9/03/2017 WwTP	EB1704666	0	12124		187.6	23.1	0.01	3860 < 0.		01 <0.01	<0.1	0.0		400		<10	2			<0.1	<0.1	<1	<1	1	-
STP 2 STP 2	Jun-17 22/06/2017 WwTP Sep-17 28/09/2017 WwTP	EB1712820002 EB1720060	2.53 0.06			25.8 92.1	22.9 23.2	0.06	4060 <0. 4230 <0.		<0.01 07 <0.01	<0.1 <0.1	<0.01	<0.01 7 0.03	385 366		<10 <10	2 1	2		<0.1 <0.1	<0.1 <0.1	<1 <1	<1 <1	1	1
STP 2	Dec-17 13/12/2017 WWTP	EB1726592	3.05	10739		46.4	23.2	0.02	3840 <0.		< 0.01	<0.1	<0.01	0.02	294		<10	2			<0.1	<0.1	<1	<1	2	
STP 2	Mar-18 21/03/2018 WwTP	EB1807282	0.13	13103	6.7	142.3	23.7	0.05	3900 <0.	1 <0.01	<0.01	<0.1	<0.01	0.03	390		<10	3	3		<0.1	<0.1	<1	<1	3	
STP 2 STP 2	Jun-18 6/06/2018 WwTP Oct-18 8/10/2018 WwTP	EB1813834 EB1824223	0.21 1.91	13178 10918		116.2 10.2	22.8 22.8	0.05 0.05	4070 <0. 4030 <0.		01 <0.01 <0.01	<0.5 <0.5	0.0 <0.01	1 0.08 <0.05	394 365		<10 <10	1	2		<0.1 <0.1	<0.1 <0.1	<1 <1.0	<1 <1.0	2	2
STP 2 STP 2	Dec-18 20/12/2018 WWTP	EB1824223 EB1831536	3.01	10918	6.44	10.2 119.4	22.8	0.05	4030 <0. 3800 <0.		<0.01 <0.1	<0.5 <0.1	<0.01	<0.05 <0.1	365		<10 <10	1	1		<0.1 <0.1	<0.1 <0.1	<1.0 <1.0	<1.0 <1.0	1	1
STP 2	Mar-19 26/03/2019 WwTP	EB1907817	0.41	11977	6.46	99.8	24.2	0.07	3960		01 <0.01	0.1		1 0.05	380		<10	1	1		<0.1	<0.1	<1.0	<1.0	1	1
STP 2	Jun-19 25/06/2019 WwTP	EB1916591	0.95	12245		102.6	23.2	0.06	3780 < 0.		< 0.01	<0.5	< 0.01	< 0.05	379		<10	1	1		<0.1	<0.1	<1.0	<1.0	1	1
STP 2 STP 2	Sep-19 17/09/2019 WwTP Dec-19 17/12/2019 WwTP	EB1924565 EB1934065	0.83			121 111	23.3 23.5	0.04	3940 <0. 4020 <0.		<0.1 <0.01	<0.1 <0.1	<0.1 <0.01	0.02	375 - 381		<10 <10	1	1		<0.1 <0.1	<0.1 <0.1	<1.0 <1.0	<1.0 <1.0	1	1
STP 2	Apr-20 15/04/2020 WwTP	EB2010933	1.13			85.5	23.5	0.18	3850	0.3 < 0.01	<0.01		<0.01	0.02	369		<10	1			<0.1	<0.1	<1.0	<1.0	1	2
STP 2	Jun-20 24/06/2020 WwTP	EB2016812	0.49	12069	5.07		26.3	0.03	3850	0.3 < 0.01	<0.01	0.4	0.4	4 0.07	369	<10	<10	2		<50	<0.1	<0.1	<1.0	<1.0	2	2
STP 2	Sep-20 22/09/2020 WwTP	EB2025060	0.42	11950	6.62	80.6		0.01		<0.5 <0.01		<0.5	<0.01	0.07	366	<10	<10	2	2	<50	<0.1	<0.1	<1.0	2	1	2
STP2 STP 2	Dec-20 8/12/2020 WwTP Apr-21 20/04/2021 WwTP	EB2032617 FB2110810	1.59 0.49	12200 11800		99.8 68.5	23.7 24.1 <0	0.31	4000 <b>4000</b> <0.1	0.6 < 0.01	<0.01 07 <0.01	<0.5	<0.01	0.12 7 0.06	375 390 -		<10 <10	2 < 2	1 1		<0.1 <0.1	<0.1 <0.1	<1 <1	<1 <1	2	-
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		LOF	μg/L R 1	μg/L 1	μg/L 50		g/L μg/L 1 1	μg/L 1	μg/L 1	μg/L 0.1	μg/L 0.1	μg/L 1	μg/L 1	μg/L 0.01	μg/L 0.01	μg/L 10	μg/L 10	μg/L 1	μg/L 1	μg/L 5	μg/L 5	1	1
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		Trigger Criterio	1.4	1.4	-	- 3	3.4 3.4	1900	1900	0.06	0.06	11	11	0.05	0.05	5	5		-	8	8	from	from
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Bore_ID	Period Sample_Date Plan		Cu	Cu_F	Fe		Pb Pb_F	Mn	Mn_F	Hg	Hg_F	Ni	Ni_F	Ag	Ag_F	Se	Se_F	Sn	Sn_F	Zn	Zn_F	E_coli	Ent
97-01 97-01	Dec-16 21/12/2016 WwTP Jun-17 22/06/2017 WwTP	EB1630075 EB1712820003	<1	.2 2 <1	2820 · 100 ·		5 <1 <1	566 91			<0.1 <0.1	<1	2 <1 <1	<0.01 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1 <1	<1 <1	<5	31 1 <5		0 970 2 <1
97-01	Dec-17 13/12/2017 WwTP	EB1726592	<1	<1	550 ·	<50 <1	<1	16	10	<0.1	<0.1	<1	<1	<0.01	<0.01	<10	<10	<1	<1			.4 !	5 26
97-01 97-01	Mar-18 21/03/2018 WwTP Jun-18 6/06/2018 WwTP	EB1807282 EB1813834	<1 <1	<1 <1	320 · 90 ·		<1 <1	6 108			<0.1 <0.1	<1 <1	<1 <1	<0.01 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1 <1	<1 <1	<5 <5	<5 <5		9 98
97-01 97-01	Sep-20 22/09/2020 WwTP	EB1813834 EB2025060	<1 <1.0	<1.0	360		1.0 <1.0	108	102	<0.1	<0.1	<1 <1.0	8	<0.01	<0.01	<10 <10	<10 <10	<1 <1.0	<1.0	<5 <5.0	<5 <5.0	<1 <1	1
97-01	Apr-21 20/04/2021 WwTP	EB2110810	<1	<1	380	<b>250</b> <1	<1	13			<0.1	<1	<1	<0.01	<0.01	<0.01	<0.01	<1	<1	<5		5 20	
DESAL 1 DESAL 1	Sep-16 27/09/2016 IWTP Dec-16 14/12/2016 IWTP	EB1623330 EB1629480		1 1 1 1	210 270	120 <1 160 <1	<1 <1	4			<0.1 <0.1	-	1 1 <1	1 <0.01 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1 <1	<1 <1	<5	<5 11 <5	<10 <2	<10 <2
DESAL 1	Mar-17 8/03/2017 IWTP	EB1704526		2 <1	740	330 <1	<1	4			<0.1	$\frown$	1	7 0.01		<10	<10	<1	<1	<5		3 <10	<10
DESAL 1	Jun-17 21/06/2017 IWTP	EB1712688001	<1	<1	510	370 <1	<1	3			<0.1	<1 <1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<2	<2
DESAL 1 DESAL 1	Sep-17 27/09/2017 IWTP Dec-17 14/12/2017 IWTP	EB1719944 ET1701842	<1 <1	<1 <1	260 970	150 <1 840 <1	<1 <1	2			<0.1 <0.1	<1 <1	<1 <1	<0.01 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1 <1	<1 <1	<5 <5	<5 <5	<1 <1	<1 <1
DESAL 1	Mar-18 22/03/2018 IWTP	EB1807442	<1	<1	810	740 <1	<1	8	7	<0.1	<0.1		1	1 < 0.01	<0.01	<10	<10	<1	<1		7 <5	<1	<1
DESAL 1 DESAL 1	Jun-18 4/06/2018 IWTP Oct-18 8/10/2018 IWTP	EB1813546 EB1824231	<1 <1	<1	360 220	320 <1 160 <1	<1	1 6			<0.1 <0.1	<1 <1	<1	4 <0.01 <001	<0.01 <0.01	<10 <10	<10 <10	<1 <1	<1 <1	<5 <5	<5	7 <1 <2	<1 <2
DESAL 1	Dec-18 18/12/2018 IWTP	EB1831182	<1	<1	240	210 <1	<1	5			<0.1	<1	14	1 <0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
DESAL 1	Mar-19 25/03/2019 IWTP	EB1907649		1 1 2 <1.0		160 <1.0 290 <1.0		6			<0.1 <0.1		1 <1.0	< 0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0 9 <5.0	<2.0	<2.0
DESAL 1 DESAL 1	Jun-19 24/06/2019 IWTP Sep-19 16/09/2019 IWTP	EB1916325 EB1924392	<1.0	<1.0	420 290	290 < 1.0		6 7			<0.1	<1.0	1 <1.0 <1.0	<0.01 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1.0 <1.0	<1.0 <1.0	<5.0	9 < 5.0 < 5.0	<10 <1	<10 <1
DESAL 1	Dec-19 16/12/2019 IWTP	EB1933892	<1.0	<1.0	240	200 <1.0		7			<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESAL 1 DESAL 1	Apr-20 15/04/2020 IWTP Jun-20 22/06/2020 IWTP	EB2010399 EB2016548	<1.0 <1.0	<1.0	180 170	140 <1.0 170 <1.0		8	-		<0.1 <0.1	<1.0 <1.0	<1.0 <1.0	<0.01 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1.0 <1.0	<1.0 <1.0	<5.0	6 <5.0	<1 7 <1	<1 <1
DESAL 1	Sep-20 24/09/2020 IWTP	EB2025327		1 <1	630		<1 <1	26	28	<0.1	<0.1	2	2	0.02			<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESAL 1 DESAL 1	Dec-20 9/12/2020 IWTP Apr-21 22/04/2021 IWTP	EB2032757 EB2111143	<1	<1 2 1	840 640	640 <1 630 <1	<1 <1	13 11		· · · · · ·	<0.1 <0.1		2 6 <1	1 <0.01 <10	<0.01 <10	<10 <0.01	<10 <0.01	<1 <1	<1 <1	<5	<b>22</b> <5	7 <1 <1	<1 <1
DESAL 2	Sep-16 27/09/2016 IWTP	EB1623330		2 1	620	350	2 <1	11			<0.1		3	3 < 0.01	<0.01	<10	<10	<1	<1	<5	<5	<10	<10
DESAL 2	Dec-16 14/12/2016 IWTP	EB1629480		2 79	870	320	1 <1	10	7	<0.1	<0.1		3	8 < 0.01	<0.01	<10	<10	<1	<1	1		.6 <10	<10
DESAL 2 DESAL 2	Mar-17 8/03/2017 IWTP Jun-17 21/06/2017 IWTP	EB1704526 EB1712688002	<1	2 <1 <1	540 830	330 600 <1	1 <1	2 13 10			<0.1 <0.1			19 0.01 2 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1 <1	<1 <1	<5 <5	<5	3 <100 <2	<100 <2
DESAL 2	Sep-17 27/09/2017 IWTP	EB1719944	<1	<1	700	340 <1	<1	7	6	<0.1	<0.1		2	1 < 0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
DESAL 2 DESAL 2	Dec-17 14/12/2017 IWTP Mar-18 22/03/2018 IWTP	ET1701842 EB1807442	<1	<1 2 <1	720 750	380 <1 560 <1	<1 <1	8			<0.1 <0.1		2 <1 1	<0.01 1 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1 <1	<1 <1	<5 <5		9 <1 9 <1	<1 <1
DESAL 2 DESAL 2	Jun-18 4/06/2018 IWTP	EB1807442 EB1813546	<1	2 <1 2	430	380 <1	<1	9			<0.1		1	2 <0.01	<0.01	<10	<10	<1	<1	<5		9 <1 9 <1	<1
DESAL 2	Oct-18 8/10/2018 IWTP	EB1824231		2 9	480	370 <1	<1	6			<0.1	<1		2 0.01		<10	<10	<1	<1	<5		.8 <2	<2
DESAL 2 DESAL 2	Dec-18 18/12/2018 IWTP Mar-19 25/03/2019 IWTP	EB1831182 EB1907649	<1 <1.0	<1	320 380	320 <1 340 <1.0	<1 <1.0	5			<0.1 <0.1	<1	<1 1	<0.01 2 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1 <1.0	<1 <1.0	<5 <5.0	<5	<1 .0 <2.0	<1 <2.0
DESAL 2	Jun-19 24/06/2019 IWTP	EB1916325	<1.0	2	430	360 <1.0	<1.0	6	7	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0		7 <2	<2
DESAL 2	Sep-19 16/09/2019 IWTP	EB1924392	<1.0	<1.0	350	330 <1.0		5			<0.1	<1.0	<1.0	< 0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESAL 2 DESAL 2	Dec-19 16/12/2019 IWTP Apr-20 15/04/2020 IWTP	EB1933892 EB2010399	<1.0	<1.0 2 <1.0	460 670	390 <1.0 570	<1.0 1 <1.0	30			<0.1 <0.1	<1.0	<1.0 2	<0.01 1 0.04	<0.01 <0.01	<10 <10	<10 <10	<1.0 <1.0	<1.0 <1.0	<5.0 <5.0	<5.0	<1 7 <1	<1 <1
DESAL 2	Jun-20 22/06/2020 IWTP	EB2016548	0.00	1 2	760	740 <1.0		12		<0.1	<0.1	<1.0		1 < 0.01	<0.01	<10	<10	<1.0	<1.0	<5.0		9 <1	<1
DESAL 2 DESAL 2	Sep-20 24/09/2020 IWTP Dec-20 9/12/2020 IWTP	EB2025327 EB2032757	<1	<1 2 <1	1010 990	1020 · 700	<1 <1 1 <1	13 25	13	<0.1 <0.1	<0.1 <0.1	1	<1 3	<0.01 2 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1.0 <1	<1.0 <1	<5.0 <5	<5.0 <5	<1 <1	<1 <1
DESAL 2	Apr-21 22/04/2021 IWTP	EB2111143	<1	<1	380	380 <1	<1	9	9	<0.1	<0.1	<1	<1	<10	<10	<0.01	<0.01	<1	<1	<5	<5	<1	<1
DESAL 3	Sep-16 27/09/2016 IWTP	EB1623330		9 <1	4030	3000	7 <1	149		0.7			14	9 < 0.01	<0.01	<10	<10	<1	<1			6 <100 2 <10	<100
DESAL 3 DESAL 3	Dec-16 14/12/2016 IWTP Mar-17 8/03/2017 IWTP	EB1629480 EB1704526		.0 1 9 <1	4930 3890	2960 2200	7 <1 7 <1	143 97			<0.1 <0.1		13 9	8 <0.01 8 0.03	<0.01 8 <0.01	<10 <10	<10 <10	<1 <1	<1 <1			.3 <10 .0 <10	<10 <10
DESAL 3	Jun-17 21/06/2017 IWTP	EB1712688003		2 <1	3260	2720	2 <1	69	57	0.2	<0.1		6	5 < 0.01	<0.01	<10	<10	<1	<1	<5	<5	<10	<10
DESAL 3 DESAL 3	Sep-17 27/09/2017 IWTP Dec-17 14/12/2017 IWTP	EB1719944 ET1701842		2 <1 2 <1	4040 2960	3360 2400	2 <1 2 <1	57 56		0.2	<0.1 <0.1		7 6	5 <0.01 4 <0.01	<0.01 <0.01	<10 <10	<10 <10	<1 <1	<1 <1	<5	<5 15 1	<10 3 <1	<10 <1
DESAL 3	Mar-18 22/03/2018 IWTP	EB1807442		3 <1	3220	2710	2 <1	46		0.1			6		<0.01	<10	<10	<1	<1			7 <1	<1
DESAL 3	Jun-18 4/06/2018 IWTP	EB1813546		2 1	3130	2900	2 <1	37	35	<0.1	<0.1		4	5 <0.01	<0.01	<10	<10	<1	<1		8	7 <10	<10



LOR       1       1       50       50       1       1       1       0.1       0.1       1       1       0.01       10       10       1	5 5 8 8 8 b 2n 2n F 6 12 < 5 < 6 6 6 <	<10 <10
$ \frac{1}{90} = \frac{1}{90} + \frac{1}{90}$	μ         μ         μ         Ν           g/L         μg/L         cl         cl </th <th>1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       &lt;2     &lt;2       &lt;10     &lt;10</th>	1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       <2     <2       <10     <10
$ \frac{1}{90} = \frac{1}{90} + \frac{1}{90}$	μ         μ         μ         Ν           g/L         μg/L         cl         cl </th <th>1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       &lt;2     &lt;2       &lt;10     &lt;10</th>	1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       <2     <2       <10     <10
$ \frac{1}{90} = \frac{1}{90} + \frac{1}{90}$	μ         μ         μ         Ν           g/L         μg/L         cl         cl </th <th>1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       &lt;2     &lt;2       &lt;10     &lt;10</th>	1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       <2     <2       <10     <10
$ \frac{1}{90} = \frac{1}{90} + \frac{1}{90}$	μ         μ         μ         Ν           g/L         μg/L         cl         cl </th <th>1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       &lt;2     &lt;2       &lt;10     &lt;10</th>	1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       <2     <2       <10     <10
$ \frac{1}{90} = \frac{1}{90} + \frac{1}{90}$	μ         μ         μ         Ν           g/L         μg/L         cl         cl </th <th>1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       &lt;2     &lt;2       &lt;10     &lt;10</th>	1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       <2     <2       <10     <10
$ \frac{1}{90} = \frac{1}{90} + \frac{1}{90}$	μ         μ         μ         Ν           g/L         μg/L         cl         cl </th <th>1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       &lt;2     &lt;2       &lt;10     &lt;10</th>	1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       <2     <2       <10     <10
Bore_ID       Period Sample_Date       Plant       Lob ReportNumber       Cu       Cu       Fe       Fe       Fe       Pe       Pb       Pb       May	5 5 8 8 8 b 2n 2n F 6 12 < 5 < 6 6 6 <	1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       <2     <2       <10     <10
LOR       1       1       50       50       1       1       1       0.1       1       1       0.01       0.01       0.01       10       1       1       1       1       1       1       1       1       0.1       1       1       0.01       0.01       10       1       1       1       1       1       1       0.01       0.01       10       1	5 5 8 8 8 b 2n 2n F 6 12 < 5 < 6 6 6 <	1     1       No change from backgroun d     No change from backgroun d       E_coli     Ent       <2     <2       <10     <10
Bore_ID       Period Sample_Date       Plant       Lab_ReportNumber       Cu       Cu / F       Fe       Fe       Fe       Pe       Pb       F       Mn       Mn       F       Hg       Hg. F       Ni       Ni       F       Ag	8 8 8 b 2n 2n_F 6 12 < <5 < 15 < 6 6 <	from backgroun d backgroun d E_coli Ent <2 <2 <10 <10
Bore_ID         Period Sample_Date         Plant         Lab_ReportNumber         Cu         Cu         Fe         Fe         Fe         Pb         Pb         Mn         Mn         F         Hg         Hg         Hg         Ag         Ag <th>8 8 8 b 2n 2n_F 6 12 &lt; &lt;5 &lt; 15 &lt; 6 6 &lt;</th> <th>from backgroun d backgroun d E_coli Ent &lt;2 &lt;2 &lt;10 &lt;10</th>	8 8 8 b 2n 2n_F 6 12 < <5 < 15 < 6 6 <	from backgroun d backgroun d E_coli Ent <2 <2 <10 <10
Bore_ID         Period Sample_Date         Plant         Lab_ReportNumber         Cu         Cu         Fe         Fe         Fe         Pb         Pb         Mn         Mn         F         Hg         Hg         Hg         Ag         Ag <th>Zn Zn_F 6 12 &lt; &lt;5 &lt; 15 &lt; 6 6 &lt;</th> <th>d         d           E_coli         Ent           &lt;2         &lt;2           &lt;10         &lt;10</th>	Zn Zn_F 6 12 < <5 < 15 < 6 6 <	d         d           E_coli         Ent           <2         <2           <10         <10
DESAL 3 Oct-18 8/10/2018 IWTP EB1824231 2 3 4080 3460 1 <1 33 29 0.1 <0.1 4 4 <0.01 <0.01 <10 <10 <1 <1	6 12 < <5 < 15 < 6 6 <	E_coli Ent <2 <2 <10 <10
DESAL 3 Oct-18 8/10/2018 IWTP EB1824231 2 3 4080 3460 1 <1 33 29 0.1 <0.1 4 4 <0.01 <0.01 <10 <10 <1 <1	6 12 < <5 < 15 < 6 6 <	<2 <2 <10 <10
DESAL3 Oct-18 8/10/2018 IWTP EB1824231 2 3 4080 3460 1 <1 33 29 0.1 <0.1 4 4 <0.01 <0.01 <10 <10 <1 <1	6 12 < <5 < 15 < 6 6 <	<2 <2 <10 <10
DESAL 3 Dec-18 18/12/2018 IWTP EB1831182 1 <1 3690 3780 <1 <1 42 44 <0.1 <0.1 3 4 <0.01 <0.01 <10 <10 <1 <1 <5	15 < 6 6 <	
	6 6 <	SZ.U SZ.U
DESAL3         Mar-19         25/03/2019         IWTP         EB1907649         1         1         5450         4500         <1.0         35         34 < 0.1         <0.1         4         4 < 0.01         <1.0         <1.0         <1.0         <5.0           DESAL3         Jun-19         24/06/2019         IWTP         EB1916325         6         <1.0		
DESAL 3 Sep-19 16/09/2019 WTP EB1924392 2 <1.0 4300 4280 <1.0 <1.0 33 36 <0.1 <0.1 4 3 <0.01 <0.01 <10 <1.0 <1.0 <1.0 <1.0		<2 <2
DESAL 3 Dec-19 16/12/2019 IWTP EB1933892 <1.0 1 4290 3860 <1.0 1 33 30 <0.1 <0.1 3 3 <0.01 <0.01 <10 <10 <1.0 <1.0 <1.0 <1.0		<1 <1
DESAL 3         Apr-20         15/04/2020 IWTP         EB2010399         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0	6 8< 5<	
	5.0 <5.0	<1 <1
DESAL 3 Dec-20 9/12/2020 IWTP EB2032757 <1 <1 11400 922 <1 <1 79 77 <0.1 <0.1 5 4 <0.01 <0.01 <10 <10 <1 <1	8 6 <	<1 <1
DESAL3         Apr-21         22/04/2021         IWTP         EB2111143         <1         <1         9850         10000 <1         <1         92         98          <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1	-	<1 <1
STP 1         Sep-16         28/09/2016         WwTP         EB1623330         <1         <1         1580         1440 <1         <1         1340         131 <0.1         <0.1         2         2 <0.01         <10         <10         <1         <1         <5           STP 1         Dec-16         21/12/2016         WwTP         EB1630075         <1	<5 <	<1 <1 <1 <1
STP1 Mar-17 9/3/2017 WWTP EB1704666 <1 <1 1830 1630 <1 <1 1420 1310 <0.1 <0.1 1 2 0.02 0.01 <10 <10 <1 <1	6 5 <	
STP 1 Jun-17 22/06/2017 WWTP EB1712820001 <1 <1 1570 1630 <1 <1 1240 1330 <0.1 <0.1 <1 <1 <0.01 <10 <10 <10 <1 <1 <5	<5 <	
STP 1         Sep-17         28/09/2017         WwTP         EB1720060         <1         1790         1680 <1         <1         1390         1340 <0.1         <0.1         <1         <100         <10         <10         <1         <1         <5           STP 1         Dec-17         13/12/2017         WwTP         EB1720592         <1	<5 < <5 <	<1 <1 <1 <1
STP 1         Dec-17         13/12/2017         WwTP         EB1726592         <1         <1         1400         1330         <0.1         <1         <1         <0.01         <10         <10         <1         <5           STP 1         Mar-18         21/03/2018         WwTP         EB1807282         <1		<1 <1
STP 1 Jun-18 6/06/2018 WWTP EB1813834 <1 <1 1630 1550 <1 <1 1280 1280 <0.1 <0.1 <1 <1 <0.01 <0.01 <1.0 <10 <1 <1 <1 <5		<1 <1
STP1         Oct-18         8/10/2018         WWTP         EB1824223         <1         2         1640         1380 <1         <1         1310         1290 <0.1         <0.1         <1         1 <0.01         <0.01         <10         <10         <1         <1         <5		<1 <1
STP 1         Dec-18         20/12/2018         WwTP         EB1831536         <1         <1         1780         1620 < 1         <1         1330 < 0.1         <0.1         1 <1         <0.01         <10         <10         <1         <5           STP 1         Mar-19         26/03/2019         WwTP         EB1907817         <1.0		<1 1 <1.0 <1.0
STP 1 Jun-19 25/6/2019 WwTP EB1916591 4.0 4.0 1680 1750 4.0 4.0 1220 1410 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.0 4.		<1 <1
STP 1 Sep-19 17/09/2019 WWTP EB1924565 <1.0 <1.0 1680 1670 <1.0 <1.0 1340 1310 <0.1 <0.1 <1.0 <1.0 <0.01 <0.01 <1.0 <1.0		<1 <1
STP 1         Dec-19         17/12/2019         WwTP         EB1934065         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0 <td></td> <td>&lt;1 &lt;1 &lt;1 &lt;1</td>		<1 <1 <1 <1
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		
STP 1 Sep-20 22/09/2020 WWTP EB2025060 <1.0 <1.0 1740 1770 <1.0 1.0 1240 1330 <0.1 <0.1 <1.0 3 <0.01 <0.01 <1.0 <1.0 <1.0 <1.0 <1.0 <1	5.0 <5.0	<1 <1
STP1         Dec-20         8/12/2020         WwTP         EB2032617         <1         1         1890         1540 <1         <1         1400         1220 <0.1         <0.1         <1         <10         <10         <1         <1         <5           STP1         Apr-21         20/04/2021         WwTP         EB2110810         <1	<5 < 5 <	<1 <1 <1 <1
STP1         Apr-21         20/04/2021         WWTP         Ebz110810         <1         1830         1880 <<1         1240         1200         <1         <1         <1         <1         <1         <1         <1         <1         1200         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1         <1 <td>÷ .</td> <td>&lt;1 &lt;1</td>	÷ .	<1 <1
STP 2 Dec.16 21/2/2016 WWT E BE803075 <1 <1 <50 <50 <1 <1 106 105 <10 <1 3 3 0.04 0.04 <10 <1 <1 <5		<1 <1
STP 2         Mar-17         9/03/2017 WwTP         EB1704666         <1         <1         60 <50         <1         104         114 <0.1         <0.1         3         6         0.07         0.06         <10         <1         <1         <5		<1 <1
STP 2       Jun-17       22/06/2017       WwTP       EB1712820002       <1       <1       <50       70 < 1       <1       100       119 < 0.1       <0.1       2       3       0.04       0.01 < 10       <1       <1       <5         STP 2       Sep-17       28/09/2017       WwTP       EB1720060       <1		<1 <1 <1 <1
51P2 5ep-17 28/09/2017 WWIP EB1720000 <1 1 50 530 51 51 970 10450.1 50.1 3 5 0.00 0.01 510 510 510 51 51 5572 Dec-17 13/2/2017 WWIP EB1720592 51 51 50 50 51 51 130 121 50 550 51 51 130 121 50 550 51 51 130 121 50 550 51 51 130 121 50 550 51 51 130 121 51 550 51 51 51 51 51 51 51 51 51 51 51 51 51		<1 <1
STP 2 Mar-18 21/03/2018 WWTP EB1807282 <1 1 <50 <50 <1 <1 154 149 <0.1 <0.1 7 6 0.03 0.02 <10 <1 <1 <5	<5 <	<1 <1
STP 2         Jun-18         6/06/2018         WWTP         EB1813834         <1         5 <50         <50         <1         113         106 <0.1         <0.1         3         4         0.02 <0.01         <10         <1         <11           STP 2         Oct-18         8/10/2018         WWTP         EB1813834         <1	15 10 <	
STP 2         Oct-18         8/10/2018         WWTP         EB1824223         <1.0         6<50         <50         <1.0         105         98<         <0.1         3         3         0.04         <0.01         <1.0         <1.0         <1.0         <5.0         <5.0         <1.0         <1.0         <1.0         <1.0         <5.0         <5.0         <1.0         <1.0         <1.0         <1.0         <1.0         <5.0         <5.0         <5.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <5.0         <5.0         <1.0         <1.0         <1.0         <1.0         <1.0         <5.0         <5.0         <5.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0         <5.0		
STP 2 Mar-19 26/3/2019 WWTP EB1907817 <1.0 <1.0 <50 <50 <1.0 <1.0 102 110 <0.1 <2.1 2 3 0.02 0.02 <10 <1.0 <1.0 <1.0 <5.0 <5.0 <1.0 <1.0 <1.0 <5.0 <5.0 <1.0 <1.0 <1.0 <5.0 <5.0 <1.0 <1.0 <5.0 <5.0 <1.0 <1.0 <5.0 <5.0 <1.0 <1.0 <5.0 <5.0 <5.0 <5.0 <5.0 <5.0 <5.0 <5		<1 <1
STP 2         Jun-19         25/06/2019         WwTP         EB1916591         <1.0         <1.0         <50         <50         <1.0         110         107         <0.1         3         2         0.02         0.02         <1.0         <1.0         <1.0         <50         <50         <1.0         110         107         <0.1         3         2         0.02         0.02         <1.0         <1.0         <1.0         <50         <50         <50         <1.0         110         107         <0.1         3         2         0.02         0.02         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0		<1 <1
STP 2         Sep-19         17/09/2019         WwTP         EB1924565         <1.0         <50         <50         <1.0         <1.0         <1.10         <1.10         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0         <1.0 <td></td> <td>&lt;1 &lt;1 &lt;1 &lt;1</td>		<1 <1 <1 <1
Dir 2 Dec 19 17/2/2019 WWIP Eb199405 CL0 CL0 CS0 CS0 CL0 CL0 L09 105 C01 C0. 2 2 0.03 0.02 Cl0 C10 C10 CL0 CL0 CS0 CS0 CS0 CL0 C10 C10 CL0 CS0 CS0 CS0 CS0 CS0 CS0 CS0 CS0 CS0 CS		
STP 2 Jun-20 24/06/2020 WwTP EB2016812 <1.0 <1.0 60 50 <1.0 <1.0 121 116 <0.1 <0.1 3 4 0.02 0.02 <10 <10 <1.0 <1.0		<1 <1
	5.0 5	<1 <1
STP2         Dec-20         8/12/2020         WwTP         EB2032617         <1         <1         <50         <50         <1         <134         <117         <0.1         4         3         0.02         0.01         <10         <1         <1         <55           STP 2         Apr-21         20/04/2021         WwTP         EB2110810         <1		<1 <1 <1 <1



### Agnes Water. Trility. Groundwater Sampling QA/QC. April 2021

			STP1	STP1 Duplicate		DESAL 1	DESAL 1 Duplicate	
Analyte	Unit	LOR	20/04/2021	20/04/2021	RPD(%)	22/04/2021	22/04/2021	RPD(%)
Ammonia as N	mg/L	0.01	0.17	0.03	140	0.08	0.12	40
Chloride	mg/L	1	1070	1070	0	116	116	0
Total Kjeldahl Nitrogen as N	mg/L	0.1	0.2	<0.1		1.7	1.8	6
Nitrate as N	mg/L	0.01	< 0.01	< 0.01		0.53	0.59	11
Nitrite as N	mg/L	0.01	< 0.01	< 0.01		< 0.05	<0.05	
Total Nitrogen as N	mg/L	0.1	0.2	<0.1		2.2	2.4	9
Nitrite + Nitrate as N	mg/L	0.1	< 0.01	< 0.01		0.53	0.59	11
Total Phosphorus as P	mg/L	0.01	0.02	0.02	0	< 0.05	<0.05	
Sulfate as SO4	mg/L	1	98	96	2	<5	<5	
Aluminium	μg/L	10	<10	<10		1020	1040	2
Aluminium (Filtered)	μg/L	10	<10	<10		1040	1060	2
Arsenic	μg/L	1	1	1	0	<1 C	<1	
Arsenic (Filtered)	μg/L	1	<1	<1		<1	<1	
Boron	μg/L	50	<50	<50		60	60	
Cadmium	μg/L	0.1	<0.1	<0.1		<0.1	<0.1	
Cadmium (Filtered)	μg/L	0.1	<0.1	<0.1		<0.1	<0.1	
Chromium	μg/L	1	<1	<1		1 0	1	0
Chromium (Filtered)	μg/L	1	<1	<1		1 ~	1	
Cobalt	μg/L	1	<1	<1		<1	<1	
Cobalt (Filtered)	μg/L	1	<1	<1	$\mathcal{D}$	<1	<1	
Copper	μg/L	1	<1	<1		2	1	
Copper (Filtered)	μg/L	1	<1	<1		1	1	
Iron	μg/L	50	1830	1710	7	640	710	10
Iron (Filtered)	μg/L	50	1580	1560	1	630	640	2
Lead	μg/L	1	<1	<1		<1	<1	
Lead (Filtered)	μg/L	1	<1	<1		<1	<1	
Manganese	μg/L	1	1240	1250	1	11	11	0
Manganese (Filtered)	μg/L	1	1200	1180	2	11	12	9
Mercury	μg/L	0.1	<0.1	<0.1		<0.1	<0.1	
Mercury (Filtered)	μg/L	0.1	<0.1	<0.1		<0.1	<0.1	
Nickel	μg/L	1	<1	<1		6	<1	
Nickel (Filtered)	μg/L	1	<1	<1		<1	<1	
Silver	μg/L	0.01	< 0.01	< 0.01		<10	<10	
Silver (Filtered)	μg/L	0.01	< 0.01	< 0.01		<10	<10	
Selenium	μg/L	10	< 0.01	< 0.01		< 0.01	<0.01	
Selenium (Filtered)	μg/L	10	< 0.01	<0.01		< 0.01	<0.01	
Tin	μg/L	1	<1	<1		<1	<1	
Tin (Filtered)	μg/L	1	<1	<1		<1	<1	
Zinc	μg/L	5	<5	<5		22	<5	
Zinc (Filtered)	μg/L	5	5	5		<5	<5	
Faecal-Coliforms	cfu/100 ml	1	<1	<1		<1	<1	
Enterococci	cfu/100 ml	1	<1	<1		<1	<1	





Surelo

Level 1 / 381 MacArthur Avenue Hamilton QLD 4007 Australia

# April 2021 Quarterly Report Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment

Plant, Agnes Water

Appendix C: Laboratory Results. COC and QA/QC Documentation

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### **CERTIFICATE OF ANALYSIS**

Work Order	: EB2110810	Page	: 1 of 4
Client	TRILITY Pty Ltd	Laboratory	Environmental Division Brisbane
Contact	p4( 6) Personal informa	Contact	: Customer Services EB
Address	LOT 40 SPRINGS ROAD	Address	: 2 Byth Street Stafford QLD Australia 4053
	AGNES WATER QLD 4677		
Telephone	: 0749757975	Telephone	2 +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 21-Apr-2021 08:30
Order number	: 4500067182	Date Analysis Commenced	: 21-Apr-2021
C-O-C number	:	Issue Date	30-Apr-2021 09:20
Sampler	: I( 6) Personal infor		Iac MRA NATA
Site	:	- C <sup>N</sup>	
Quote number	: BN/222/16	· S	Accreditation No. 825
No. of samples received	: 4	$\sim$ $\sim$	Accredited for compliance with
No. of samples analysed	: 4		ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

6) Personal info

Senior Inorganic Chemist Microbiologist Senior Inorganic Chemist Assistant Laboratory Manager

Brisbane Inorganics, Stafford, QLD Brisbane Microbiological, Stafford, QLD Brisbane Inorganics, Stafford, QLD Brisbane Administration, Stafford, QLD





#### **General Comments**

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

Key: CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

^ = This result is computed from individual analyte detections at or above the level of reporting

ø = ALS is not NATA accredited for these tests.

~ = Indicates an estimated value.

• MF = membrane filtration

• CFU = colony forming unit

Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range
of 10 - 100cfu.

- EK061G (Total Kjeldahl Nitrogen as N): Some samples were diluted due to matrix interference. LOR adjusted accordingly.
- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for samples STP1 (EB2110810-001) & 97-01 (EB2110810-003). However, the difference is within experimental variation of the methods.
- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for sample 97-01 (EB2110810-003). This has been confirmed by re-digestion and re-analysis.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.



### Analytical Results

ED045G: Chloride by Discrete Analyser Chloride 1 EG020F: Dissolved Metals by ICP-MS Aluminium Arsenic Cadmium Chromium Chromium Copper Cobalt Nickel Lead Zinc Manganese Selenium Tin Iron	DA 14808-79-8 16887-00-6 7429-90-5 7440-38-2	1	u mg/L	20-Apr-2021 09:48 EB2110810-001 Result 98	20-Apr-2021 11:25 EB2110810-002 Result	20-Apr-2021 12:15 EB2110810-003 Result	20-Apr-2021 09:52 EB2110810-004	
Sulfate as SO4 - Turbidimetric       1         ED045G: Chloride by Discrete Analyser       1         Chloride       1         EG020F: Dissolved Metals by ICP-MS       1         Aluminium       Arsenic         Cadmium       1         Chromium       1         Copper       1         Cobalt       1         Nickel       1         Lead       2         Zinc       1         Manganese       1         Selenium       1         Tin       1	14808-79-8 16887-00-6 7429-90-5			Result		EB2110810-003	EB2110810-004	
Sulfate as SO4 - Turbidimetric       1         ED045G: Chloride by Discrete Analyser       1         Chloride       1         EG020F: Dissolved Metals by ICP-MS       1         Aluminium       1         Arsenic       1         Cadmium       1         Chromium       1         Copper       1         Cobalt       1         Nickel       1         Lead       2         Zinc       1         Manganese       1         Selenium       1         Tin       1         Iron       1	14808-79-8 16887-00-6 7429-90-5			Result				
Sulfate as SO4 - Turbidimetric       1         ED045G: Chloride by Discrete Analyser       1         Chloride       1         EG020F: Dissolved Metals by ICP-MS       1         Aluminium       1         Arsenic       1         Cadmium       1         Chromium       1         Copper       1         Cobalt       1         Nickel       1         Lead       2         Zinc       1         Manganese       1         Selenium       1         Tin       1         Iron       1	14808-79-8 16887-00-6 7429-90-5						Result	
Sulfate as SO4 - Turbidimetric       1         ED045G: Chloride by Discrete Analyser       1         Chloride       1         EG020F: Dissolved Metals by ICP-MS       1         Aluminium       1         Arsenic       1         Cadmium       1         Chromium       1         Copper       1         Cobalt       1         Nickel       1         Lead       2         Zinc       1         Manganese       1         Selenium       1         Tin       1         Iron       1	14808-79-8 16887-00-6 7429-90-5			98				
Chloride 1  GO20F: Dissolved Metals by ICP-MS  Aluminium  Arsenic Cadmium  Chromium  Copper  Cobalt Nickel Lead Zinc  Manganese Selenium Tin Iron	7429-90-5	1			390	8	96	
Chloride 1 EG020F: Dissolved Metals by ICP-MS Aluminium Arsenic Cadmium Chromium Copper Cobalt Nickel Lead Zinc Manganese Selenium Tin Iron	7429-90-5	1						
Aluminium         Arsenic         Cadmium         Chromium         Copper         Cobalt         Nickel         Lead         Zinc         Manganese         Selenium         Tin         Iron			mg/L	1070	4000	101	1070	
Aluminium         Arsenic         Cadmium         Chromium         Copper         Cobalt         Nickel         Lead         Zinc         Manganese         Selenium         Tin         Iron					2			
Cadmium Chromium Copper Cobalt Nickel Lead Zinc Manganese Selenium Tin	7440-38-2	0.01	mg/L	<0.01	<0.01	1.54	<0.01	
Chromium Copper Cobalt Nickel Lead Zinc Manganese Selenium Tin		0.001	mg/L	<0.001	0.001	<0.001	<0.001	
Copper Cobalt Nickel Lead Zinc Manganese Selenium Tin Iron	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	
Cobalt Nickel Lead Zinc Manganese Selenium Tin Iron	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	
Cobalt Nickel Lead Zinc Manganese Selenium Tin Iron	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	
Lead Zinc Manganese Selenium Tin Iron	7440-48-4	0.001	mg/L	<0.001	0.002	<0.001	<0.001	
Zinc Manganese Selenium Tin Iron	7440-02-0	0.001	mg/L	<0.001	0.004	<0.001	<0.001	
Manganese Selenium Tin Iron	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	
Selenium Tin Iron	7440-66-6	0.005	mg/L	0.005	<0.005	0.005	<0.005	
Tin Iron	7439-96-5	0.001	mg/L	1.20	0.119	0.008	1.18	
Iron	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	
	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	
	7439-89-6	0.05	mg/L	1.58	<0.05	0.25	1.56	
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	1.09	<0.01	
Arsenic	7440-38-2	0.001	mg/L	0.001	0.002	<0.001	0.001	
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	
Cobalt	7440-48-4	0.001	mg/L	<0.001	0.002	<0.001	<0.001	
Nickel	7440-02-0	0.001	mg/L	<0.001	0.004	<0.001	<0.001	
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	
Manganese	7439-96-5	0.001	mg/L	1.24	0.126	0.013	1.25	
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	<0.05	
Iron	7439-89-6	0.05	mg/L	1.83	<0.05	0.38	1.71	
EG035F: Dissolved Mercury by FIMS								
	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	 Page 63 of 200



### Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	97-01	STP1 Duplicate	
			и	20-Apr-2021 09:48	20-Apr-2021 11:25	20-Apr-2021 12:15	20-Apr-2021 09:52	
				EB2110810-001	EB2110810-002	EB2110810-003	EB2110810-004	
				Result	Result	Result	Result	
EG035T: Total Recoverable Mercury	/ by FIMS							
Mercury		0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	
EG094F: Dissolved Metals in Fresh	Water by ORC-ICPMS							
Silver	7440-22-4	0.01	µg/L	<0.01	0.01	<0.01	<0.01	
EG094T: Total metals in Fresh water	by ORC-ICPMS				2			
Silver	7440-22-4	0.01	µg/L	<0.01	0.01	<0.01	<0.01	
EK055G: Ammonia as N by Discrete	Analyser				, C'			
Ammonia as N	7664-41-7	0.01	mg/L	0.17	<0.01	0.52	0.03	
EK057G: Nitrite as N by Discrete An	alvser							
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	
EK058G: Nitrate as N by Discrete A	nalyser			G				
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	0.07	0.02	<0.01	
EK059G: Nitrite plus Nitrate as N (N	Ox) by Discrete Analy	/ser			X			
Nitrite + Nitrate as N		0.01	mg/L	<0.01	0.07	0.02	<0.01	
EK061G: Total Kjeldahl Nitrogen By	Discrete Analyser							
Total Kjeldahl Nitrogen as N		0.1	mg/L	0.2	<0.5	0.8	<0.1	
EK062G: Total Nitrogen as N (TKN +	NOx) by Discrete Ana	lvser						
^ Total Nitrogen as N		0.1	mg/L	0.2	<0.5	0.8	<0.1	
EK067G: Total Phosphorus as P by	Discrete Analyser							
Total Phosphorus as P		0.01	mg/L	0.02	0.06	0.04	0.02	
EN67: Field Tests			19					
Ø Electrical Conductivity (Non		1	µS/cm	3780	11800	377	3780	
Compensated)			$\mathbf{P}$					
ø Dissolved Oxygen		0.1	mg/L	0.28	0.49	2.48	0.28	
Ø pH		0.01	pH Unit	6.56	6.38	5.75	6.56	
Ø Temperature		0.1	°C	24.1	24.1	21.8	24.1	
Ø Reactive Phosphorus as P	14265-44-2	0.01	mg/L	6.2	68.5	133.0	6.2	
MW006: Faecal Coliforms & E.coli by	y MF							
Faecal Coliforms		1	CFU/100mL	<1	<1	20	<1	
MW023: Enterococci by Membrane F	iltration							
Enterococci		1	CFU/100mL	<1	<1	11	<1	



### QUALITY CONTROL REPORT

Work Order	: EB2110810	Page	: 1 of 7
Client	: TRILITY Pty Ltd	Laboratory	: Environmental Division Brisbane
Contact Address	: 4(6) Personal inform	Contact Address	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 0749757975	Telephone	+61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 21-Apr-2021
Order number	: 4500067182	Date Analysis Commenced	: 21-Apr-2021
C-O-C number	:	Issue Date	: 30-Apr-2021
Sampler	(4) Personal inform		Iac-MRA NATA
Site	:	. 6	
Quote number	: BN/222/16		Accreditation No. 825
No. of samples received	: 4		Accredited for compliance with
No. of samples analysed	: 4		ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

(6) Personal info

Senior Inorganic Chemist Microbiologist Senior Inorganic Chemist Assistant Laboratory Manager

Brisbane Inorganics, Stafford, QLD Brisbane Microbiological, Stafford, QLD Brisbane Inorganics, Stafford, QLD Brisbane Administration, Stafford, QLD



#### **General Comments**

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: WATER					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%		
D041G: Sulfate (Tu	rbidimetric) as SO4 2- I	by DA (QC Lot: 3637176)									
EB2110810-002	STP2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	390	395	1.20	0% - 20%		
EB2110582-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	301	305	1.21	0% - 20%		
D045G: Chloride by	y Discrete Analyser (Q	C Lot: 3637178)									
B2110810-002	STP2	ED045G: Chloride	16887-00-6	1	mg/L	4000	4020	0.431	0% - 20%		
B2110582-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	10	10	0.00	0% - 50%		
G020F: Dissolved I	Metals by ICP-MS (QC	Lot: 3635186)									
B2110760-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit		
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit		
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit		
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.005	0.005	0.00	No Limit		
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit		
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit		
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.014	0.015	0.00	0% - 50%		
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.00	No Limit		
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit		
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.008	0.008	0.00	No Limit		
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit		
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit		
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit		
B2110813-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit		
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.006	0.006	0.00	No Limit		
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit		
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit		
22-265		EG020A-F: Copper	<sup>7440-50-8</sup> File C	0.001	mg/L	0.001	<0.001	0.00 Pag	No Limit		

Page	: 3 of 7
Work Order	: EB2110810
Client	: TRILITY Pty Ltd
Project	: GROUNDWATER MONITORING



p-Matrix: WATER						Laboratory	Duplicate (DUP) Report	ort		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
EG020F: Dissolved I	Metals by ICP-MS (QC	CLot: 3635186) - continued								
EB2110813-001	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.001	<0.001	0.00	No Limit	
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit	
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit	
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit	
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit	
G020T: Total Metal	Is by ICP-MS (QC Lot	3635420)								
EB2110808-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0079	0.0080	2.16	0% - 20%	
	-	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.001	0.001	0.00	No Limit	
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.011	0.011	0.00	0% - 50%	
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.002	0.002	0.00	No Limit	
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.008	0.008	0.00	No Limit	
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.002	0.002	0.00	No Limit	
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.856	0.884	3.20	0% - 20%	
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.031	0.032	3.79	0% - 20%	
		EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.391	0.410	4.70	0% - 20%	
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.02	0.02	0.00	No Limit	
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit	
		EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	0.00	No Limit	
		EG020A-T: Iron	7439-89-6	0.05	mg/L	96.6	99.8	3.22	0% - 20%	
EB2110813-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit	
	,	EG020A-T: Arsenic	7440-38-2	0.001	mg/L	0.007	0.006	0.00	No Limit	
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	< 0.001	<0.001	0.00	No Limit	
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	< 0.001	<0.001	0.00	No Limit	
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.001	<0.001	0.00	No Limit	
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.011	0.011	0.00	0% - 50%	
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.001	0.001	0.00	No Limit	
		EG020A-T: Tin	7440-31-5	0.001	mg/L	0.002	<0.001	83.9	No Limit	
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.005	<0.005	0.00	No Limit	
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.21	0.18	15.0	0% - 20%	
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit	
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.08	0.09	0.00	No Limit	
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.24	0.21	13.5	No Limit	
G035E: Dissolved	Mercury by FIMS (QC									
EB2110810-003	97-01	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit	
	01-01		1+39-91-0	0.0001	IIIY/L	~0.0001	<b>∼</b> 0.0001	0.00	INU LIITIIL	



Sub-Matrix: WATER									
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%
EG035T: Total Reco	overable Mercury b	y FIMS (QC Lot: 3635422)							
EB2110665-003	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2110810-003	97-01	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG094F: Dissolved	Metals in Fresh Wa	ater by ORC-ICPMS (QC Lot: 3635202)				0			
EB2110810-001	STP1	EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EG094T: Total metal	ls in Fresh water b	y ORC-ICPMS (QC Lot: 3635424)			. 25				
EB2110810-001	STP1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EK055G: Ammonia	as N by Discrete A	nalyser (QC Lot: 3644703)		0					
EB2110683-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB2108404-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.03	0.03	0.00	No Limit
EK057G: Nitrite as I	N by Discrete Anal	yser (QC Lot: 3637175)		.U					
EB2110810-002	STP2	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB2110582-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
K057G: Nitrite as I	N by Discrete Anal	yser (QC Lot: 3637179)							
EB2110810-003	97-01	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB2110998-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK059G: Nitrite plu	s Nitrate as N (NO)	x) by Discrete Analyser (QC Lot: 3644705)							
EB2110690-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.01	mg/L	0.15	0.15	0.00	0% - 50%
EB2110813-002	Anonymous	EK059G: Nitrite + Nitrate as N	· · · · ·	0.01	mg/L	<0.01	<0.01	0.00	No Limit
K061G: Total Kjeld	lahl Nitrogen By Di	screte Analyser (QC Lot: 3638364)							
EB2110409-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	16.5	16.1	2.60	0% - 20%
EB2110876-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	0.9	0.8	16.9	No Limit
K067G: Total Phos	phorus as P by Dis	screte Analyser (QC Lot: 3638363)							
EB2110409-001	Anonymous	EK067G: Total Phosphorus as P		0.01	mg/L	3.90	3.81	2.34	0% - 20%
EB2110876-001	Anonymous	EK067G: Total Phosphorus as P		0.01	mg/L	2.17	2.17	0.00	0% - 20%
		<i>Briton</i>							



### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: WATER				Method Blank (MB)		Laboratory Control Spike (LC	Laboratory Control Spike (LCS) Report		
				Report	Spike	Spike Recovery (%)	Acceptat	le Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	A (QCLot: 3637176)				5				
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	102	85.0	118	
				<1	100 mg/L	98.2	85.0	118	
ED045G: Chloride by Discrete Analyser (QCLot:	: 3637178)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	90.0	115	
				<1	1000 mg/L	105	90.0	115	
EG020F: Dissolved Metals by ICP-MS (QCLot: 3	635186)			5					
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	99.0	79.0	118	
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	88.0	116	
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.9	88.0	108	
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.9	87.0	113	
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	104	86.0	112	
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.1	88.0	114	
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	90.1	89.0	110	
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.6	89.0	120	
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.2	89.0	113	
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	101	83.0	112	
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	101	86.0	112	
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	102	87.0	113	
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	82.0	114	
EG020T: Total Metals by ICP-MS (QCLot: 363542	20)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	95.6	80.0	114	
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	97.4	88.0	112	
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	93.7	88.0	111	
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.2	89.0	115	
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	115	
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	116	
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.7	89.0	112	
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	100.0	88.0	114	
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.8	88.0	116	
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	97.1	79.0	111	
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	101	86.0	116	
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	110	84.0	114	
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	102	82.0	128	
EG020A-T: Ir <b>22-265</b>	7439-89-6	0.05	<sup>mg/L</sup> File C	<0.05	0.5 mg/L	101	Pade 69	of 200 <sup>118</sup>	



Sub-Matrix: WATER				Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High	
EG035F: Dissolved Mercury by FIMS (QCLot: 3635185)					$\mathbf{A}$				
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	97.4	84.0	118	
EG035T: Total Recoverable Mercury by FIMS (QCLot:	3635422)								
G035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	97.6	84.0	118	
G094F: Dissolved Metals in Fresh Water by ORC-ICPM	IS (QCLot: 3635202	)			3				
G094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	101	70.0	130	
G094T: Total metals in Fresh water by ORC-ICPMS(C	CLot: 3635424)			6					
G094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	103	70.0	130	
K055G: Ammonia as N by Discrete Analyser (QCLot:	3644703)								
K055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	101	83.5	114	
EK057G: Nitrite as N by Discrete Analyser (QCLot: 363	37175)			Nº O					
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	110	
EK057G: Nitrite as N by Discrete Analyser (QCLot: 363	37179)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	101	90.0	110	
EK059G:Nitrite plus Nitrate as N (NOx) by Discrete Ar	alyser (QCLot: 364	4705)							
K059G: Nitrite + Nitrate as N		0.01	mg/L	<0.01	0.5 mg/L	93.4	85.7	111	
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser	(QCLot: 3638364)		VN	)					
K061G: Total Kjeldahl Nitrogen as N		0.1	.mg/L	<0.1	10 mg/L	98.2	70.1	108	
K067G: Total Phosphorus as P by Discrete Analyser	(QCLot: 3638363)								
K067G: Total Phosphorus as P		0.01	mg/L	<0.01	4.42 mg/L	95.5	79.2	105	

### Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Lin	nits (%)
aboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (T	urbidimetric) as SO4 2- by DA (QCLot: 3637176)						
EB2110582-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	200 mg/L	129	70.0	130
D045G: Chloride	by Discrete Analyser (QCLot: 3637178)						
EB2110582-002	Anonymous	ED045G: Chloride	16887-00-6	4000 mg/L	112	70.0	130
G020F: Dissolved	I Metals by ICP-MS (QCLot: 3635186)						
EB2110760-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	105	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	100	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	86.3	70.0	130
22-265		EG020A-F: Cobalt File C	7440-48-4	1 mg/L	97.6	70.0 Page 70 of 2	200 <sup>130</sup>



aboratory sample ID EG020F: Dissolved	Sample ID						
	Sample ID			Spike	SpikeRecovery(%)	Acceptable	Limits (%)
G020F: Dissolved	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
	Metals by ICP-MS (QCLot: 3635186) - continued						
EB2110760-002	Anonymous	EG020A-F: Copper	7440-50-8	1 mg/L	95.3	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	94.7	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	89.6	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	98.6	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	109	70.0	130
G020T: Total Meta	als by ICP-MS (QCLot: 3635420)						
EB2110810-001	STP1	EG020A-T: Arsenic	7440-38-2	1 mg/L	108	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	101	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	92.6	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	103	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	104	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	98.8	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	96.9	70.0	130
	EG020A-T: Nickel	7440-02-0	1 mg/L	101	70.0	130	
		EG020A-T: Zinc	7440-66-6	1 mg/L	107	70.0	130
G035F: Dissolved	I Mercury by FIMS (QCLot: 3635185)						
EB2110760-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	88.3	70.0	130
G035T: Total Rec	coverable Mercury by FIMS (QCLot: 3635422)						
EB2110665-004	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	99.6	70.0	130
K055G: Ammonia	as N by Discrete Analyser (QCLot: 3644703)	-0 0-					1
	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	101	70.0	130
	N by Discrete Analyser (QCLot: 3637175)	PERCOOC. Ammonia as IV		01111g/2			
			44707.05.0	4	00.5	70.0	100
	Anonymous	EK057G: Nitrite as N	14797-65-0	4 mg/L	88.5	70.0	130
	N by Discrete Analyser (QCLot: 3637179)						
EB2110998-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	105	70.0	130
K059G: Nitrite pl	us Nitrate as N (NOx) by Discrete Analyser (QCLot: 3	644705)					
EB2110813-002	Anonymous	EK059G: Nitrite + Nitrate as N		0.4 mg/L	97.0	70.0	130
K061G: Total <u>Kjel</u>	dahl Nitrogen By Discrete Analyser (QCLot: 3638364)						
EB2110409-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		5 mg/L	# Not	70.0	130
				- ·J· –	Determined		
K067G Total Pho	sphorus as P by Discrete Analyser (QCLot: 3638363)						1
EB2110409-003	Anonymous	EK067C: Total December in as D		1 mg/L	# Not	70.0	130
	, alonymous	EK067G: Total Phosphorus as P		i iiig/L	# Not Determined	70.0	150



# QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2110810	Page : 1 of 7	
Client	: TRILITY Pty Ltd	Laboratory : Environmental Division Brisbane	
Contact	94( 6) Personal inform	Telephone : +61-7-3243 7222	
Project	: GROUNDWATER MONITORING	Date Samples Received : 21-Apr-2021	
Site	·	Issue Date : 30-Apr-2021	
Sampler	4( 6) Personal infor	No. of samples received 4	
Order number	4500067182	No. of samples analysed : 4	

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

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Brief method summaries and references are also provided to assist in traceability.

### **Summary of Outliers**

### **Outliers : Quality Control Samples**

#### This report highlights outliers flagged in the Quality Control (QC) Report.

- <u>NO</u> Method Blank value outliers occur.
- <u>NO</u> Duplicate outliers occur.
- <u>NO</u> Laboratory Control outliers occur.
- Matrix Spike outliers exist please see following pages for full details.
- For all regular sample matrices, <u>NO</u> surrogate recovery outliers occur.

### **Outliers : Analysis Holding Time Compliance**

• <u>NO</u> Analysis Holding Time Outliers exist.

### **Outliers : Frequency of Quality Control Samples**

• <u>NO</u> Quality Control Sample Frequency Outliers exist.



#### **Outliers : Quality Control Samples**

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

#### Matrix: WATER

Compound Group Name	Laboratory Sample ID	Client Sample ID	Analyte	CAS Number Data	Limits	Comment
Matrix Spike (MS) Recoveries						
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser	EB2110409003	Anonymous	Total Kjeldahl Nitrogen	Not		MS recovery not determined,
			as N	Determined		background level greater than or
						equal to 4x spike level.
EK067G: Total Phosphorus as P by Discrete Analyser	EB2110409003	Anonymous	Total Phosphorus as P	Not		MS recovery not determined,
				Determined		background level greater than or
				S		equal to 4x spike level.

## Analysis Holding Time Compliance

If samples are identified below as having been analysed or extracted outside of recommended holding times, this should be taken into consideration when interpreting results.

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times (referencing USEPA SW 846, APHA, AS and NEPM) based on the sample container provided. Dates reported represent first date of extraction or analysis and preclude subsequent dilutions and reruns. A listing of breaches (if any) is provided herein.

Holding time for leachate methods (e.g. TCLP) vary according to the analytes reported. Assessment compares the leach date with the shortest analyte holding time for the equivalent soil method. These are: organics 14 days, mercury 28 days & other metals 180 days. A recorded breach does not guarantee a breach for all non-volatile parameters.

Holding times for VOC in soils vary according to analytes of interest. Vinyl Chloride and Styrene holding time is 7 days; others 14 days. A recorded breach does not guarantee a breach for all VOC analytes and should be verified in case the reported breach is a false positive or Vinyl Chloride and Styrene are not key analytes of interest/concern.

Matrix: WATER					Evaluation	n: × = Holding time	breach ; ✓ = With	n holding time
Method		Sample Date	E	traction / Preparation			Analysis	
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Clear Plastic Bottle - Natural (ED041G) STP1, 97-01,	STP2, STP1 Duplicate	20-Apr-2021				22-Apr-2021	18-May-2021	~
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G) STP1, 97-01,	STP2, STP1 Duplicate	20-Apr-2021				22-Apr-2021	18-May-2021	~
EG020F: Dissolved Metals by ICP-MS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020	A-F)							
STP1, 97-01,	STP2, STP1 Duplicate	20-Apr-2021				23-Apr-2021	17-Oct-2021	~
EG020T: Total Metals by ICP-MS							1	
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG0	20A-T)							
STP1,	STP2,	20-Apr-2021	23-Apr-2021	17-Oct-2021	1	23-Apr-2021	17-Oct-2021	✓
97-01,	STP1 Duplicate							
EG035F: Dissolved Mercury by FIMS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035	F)							
STP1,	STP2,	20-Apr-2021				23-Apr-2021	18-May-2021	✓
97-01,	STP1 Duplicate						D	
22-265	F	ile C					Page 73 of 2	00

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Matrix: WATER						Evaluation	: × = Holding time	breach ; ✓ = Withi	n holding time
Method			Sample Date	Ex	traction / Preparation			Analysis	
Container / Client Sample ID(s)				Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS					0				
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG0	35T)								
STP1,	STP2,		20-Apr-2021		0		27-Apr-2021	18-May-2021	✓
97-01,	STP1 Duplicate								
EG094F: Dissolved Metals in Fresh Water by ORC-ICF	PMS			.01					
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094	-AgF)								
STP1,	STP2,		20-Apr-2021				23-Apr-2021	17-Oct-2021	✓
97-01,	STP1 Duplicate			S					
EG094T: Total metals in Fresh water by ORC-ICPMS				0					
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG0			C						
STP1,	STP2,		20-Apr-2021	23-Apr-2021	17-Oct-2021	~	23-Apr-2021	17-Oct-2021	✓
97-01,	STP1 Duplicate								
EK055G: Ammonia as N by Discrete Analyser				$\mathbf{O}$					
Clear Plastic Bottle - Sulfuric Acid (EK055G)				<u> </u>					
STP1,	STP2,	6	20-Apr-2021				27-Apr-2021	18-May-2021	✓
97-01,	STP1 Duplicate		<u> </u>						
EK057G: Nitrite as N by Discrete Analyser			XV						
Clear Plastic Bottle - Natural (EK057G)			C						
STP1,	STP2,		20-Apr-2021				22-Apr-2021	22-Apr-2021	✓
97-01,	STP1 Duplicate								
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete A	Analyser								
Clear Plastic Bottle - Sulfuric Acid (EK059G)									
STP1,	STP2,		20-Apr-2021				27-Apr-2021	18-May-2021	✓
97-01,	STP1 Duplicate								
EK061G: Total Kjeldahl Nitrogen By Discrete Analyse									
Clear Plastic Bottle - Sulfuric Acid (EK061G)					40.04			40.00	
STP1,	STP2,		20-Apr-2021	24-Apr-2021	18-May-2021	~	24-Apr-2021	18-May-2021	✓
97-01,	STP1 Duplicate								
EK067G: Total Phosphorus as P by Discrete Analyser									
Clear Plastic Bottle - Sulfuric Acid (EK067G)									
STP1,	STP2,		20-Apr-2021	24-Apr-2021	18-May-2021	~	24-Apr-2021	18-May-2021	✓
97-01,	STP1 Duplicate								
MW006: Faecal Coliforms & E.coli by MF									
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)									
STP1,	STP2,		20-Apr-2021				21-Apr-2021	21-Apr-2021	✓
97-01,	STP1 Duplicate								
MW023: Enterococci by Membrane Filtration									
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)									
STP1,	STP2,		20-Apr-2021				21-Apr-2021	21-Apr-2021	✓
97-01,	STP1 Duplicate								

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# **Quality Control Parameter Frequency Compliance**

The following report summarises the frequency of laboratory QC samples analysed within the analytical lot(s) in which the submitted sample(s) was(were) processed. Actual rate should be greater than or equal to the expected rate. A listing of breaches is provided in the Summary of Outliers.

Matrix: WATER				Evaluation	n: 🗴 = Quality Co	ontrol frequency r	not within specification ; ✓ = Quality Contr	ol frequency within specificati
Quality Control Sample Type		С	ount		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation		
Laboratory Duplicates (DUP)						0.		
Ammonia as N by Discrete analyser	EK055G	2	19	10.53	10.00	$\checkmark$	NEPM 2013 B3 & ALS QC Standard	
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	1	NEPM 2013 B3 & ALS QC Standard	
Dissolved Mercury by FIMS	EG035F	2	20	10.00	10.00	1	NEPM 2013 B3 & ALS QC Standard	
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard	
Low-Level Dissolved Silver in Fresh Water by	EG094-AgF	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard	
ORC-ICPMS					D'			
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard	
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard	
Nitrite as N by Discrete Analyser	EK057G	4	31	12.90	10.00	✓	NEPM 2013 B3 & ALS QC Standard	
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Mercury by FIMS	EG035T	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Metals by ICP-MS - Suite A	EG020A-T	2	18	11.11	10.00	~	NEPM 2013 B3 & ALS QC Standard	
Total Phosphorus as P By Discrete Analyser	EK067G	2	19	10.53	10.00	~	NEPM 2013 B3 & ALS QC Standard	
Laboratory Control Samples (LCS)								
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Chloride by Discrete Analyser	ED045G	2	20	10.00	10.00	✓	NEPM 2013 B3 & ALS QC Standard	
Dissolved Mercury by FIMS	EG035F		20	5.00	5.00	<u> </u>	NEPM 2013 B3 & ALS QC Standard	
Dissolved Metals by ICP-MS - Suite A	EG020A-F	0 1	20	5.00	5.00	<u> </u>	NEPM 2013 B3 & ALS QC Standard	
Low-Level Dissolved Silver in Fresh Water by	EG094-AqF	1	4	25.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
ORC-ICPMS						-		
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	~	NEPM 2013 B3 & ALS QC Standard	
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Nitrite as N by Discrete Analyser	EK057G	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	20	10.00	10.00	~	NEPM 2013 B3 & ALS QC Standard	
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Metals by ICP-MS - Suite A	EG020A-T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Total Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	√	NEPM 2013 B3 & ALS QC Standard	
Method Blanks (MB)								
Ammonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard	
Chloride by Discrete Analyser	ED045G	1	20	5.00	5.00	✓ ✓	NEPM 2013 B3 & ALS QC Standard	
Dissolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✓ ✓	NEPM 2013 B3 & ALS QC Standard	
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	✓ ✓	NEPM 2013 B3 & ALS QC Standard	
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS22-265	EG094-AgF	1	4 File	25.00 e C	5.00	~	NEPM 2013 B3 & ALS QC Standard	Page 75 of 200

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		Cc	ount		Rate (%)		Quality Control Specification
nalytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation	
lethod Blanks (MB) - Continued						2	
ow-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	4	25.00	5.00	1	NEPM 2013 B3 & ALS QC Standard
itrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00		NEPM 2013 B3 & ALS QC Standard
itrite as N by Discrete Analyser	EK057G	2	31	6.45	5.00		NEPM 2013 B3 & ALS QC Standard
ulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	2.1	NEPM 2013 B3 & ALS QC Standard
otal Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	~	NEPM 2013 B3 & ALS QC Standard
otal Mercury by FIMS	EG035T	1	20	5.00	5.00	~	NEPM 2013 B3 & ALS QC Standard
otal Metals by ICP-MS - Suite A	EG020A-T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
otal Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	✓	NEPM 2013 B3 & ALS QC Standard
latrix Spikes (MS)				(			
mmonia as N by Discrete analyser	EK055G	1	19	5.26	5.00	~	NEPM 2013 B3 & ALS QC Standard
hloride by Discrete Analyser	ED045G	1	20	5.00	5.00	~	NEPM 2013 B3 & ALS QC Standard
issolved Mercury by FIMS	EG035F	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
issolved Metals by ICP-MS - Suite A	EG020A-F	1	20	5.00	5.00	~	NEPM 2013 B3 & ALS QC Standard
itrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	20	5.00	5.00	~	NEPM 2013 B3 & ALS QC Standard
itrite as N by Discrete Analyser	EK057G	2	31	6.45	5.00	✓	NEPM 2013 B3 & ALS QC Standard
ulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	20	5.00	5.00	~	NEPM 2013 B3 & ALS QC Standard
otal Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
otal Mercury by FIMS	EG035T	1	20	5.00	5.00	✓	NEPM 2013 B3 & ALS QC Standard
otal Metals by ICP-MS - Suite A	EG020A-T	1	18	5.56	5.00	✓	NEPM 2013 B3 & ALS QC Standard
otal Phosphorus as P By Discrete Analyser	EK067G	1	19	5.26	5.00	1	NEPM 2013 B3 & ALS QC Standard



# **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the US EPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by client request. The following report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis. Sources from which ALS methods have been developed are provided within the Method Descriptions.

Analytical Methods	Method	Matrix	Method Descriptions
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	WATER	In house: Referenced to APHA 4500-SO4. Dissolved sulfate is determined in a 0.45um filtered sample. Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium with barium chloride. Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading with a standard curve. This method is compliant with NEPM Schedule B(3)
Chloride by Discrete Analyser	ED045G	WATER	In house: Referenced to APHA 4500 CI - G. The thiocyanate ion is liberated from mercuric thiocyanate through sequestration of mercury by the chloride ion to form non-ionised mercuric chloride.in the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate which is measured at 480 nm APHA seal method 2 017-1-L
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. Samples are 0.45µm filtered prior to analysis. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020, ALS QWI-EN/EG020. The ICPMS technique utilizes a highly efficient argon plasma to ionize selected elements. Ions are then passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector.
Dissolved Mercury by FIMS	EG035F	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) Samples are 0.45µm filtered prior to analysis. FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the filtered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Total Mercury by FIMS	EG035T	WATER	In house: Referenced to AS 3550, APHA 3112 Hg - B (Flow-injection (SnCl2)(Cold Vapour generation) AAS) FIM-AAS is an automated flameless atomic absorption technique. A bromate/bromide reagent is used to oxidise any organic mercury compounds in the unfiltered sample. The ionic mercury is reduced online to atomic mercury vapour by SnCl2 which is then purged into a heated quartz cell. Quantification is by comparing absorbance against a calibration curve. This method is compliant with NEPM Schedule B(3).
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM Schedule B(3).
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AqT	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	EK055G	WATER	In house: Referenced to APHA 4500-NH3 G Ammonia is determined by direct colorimetry by Discrete Analyser.
			This method is compliant with NEPM Schedule B(3)
Nitrite as N by Discrete Analyser	EK057G	WATER	In house: Referenced to APHA 4500-NO2- B. Nitrite is determined by direct colourimetry by Discrete Analyser.
			This method is compliant with NEPM Schedule B(3)
Nitrate as N by Discrete Analyser	EK058G	WATER	In house: Referenced to APHA 4500-NO3- F. Nitrate is reduced to nitrite by way of a chemical reduction followed
			by quantification by Discrete Analyser. Nitrite is determined seperately by direct colourimetry and result for Nitrate
			calculated as the difference between the two results. This method is compliant with NEPM Schedule B(3)
Nitrite and Nitrate as N (NOx) by Discrete	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by
Analyser			Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM
			Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high
Analyser			temperature Kjeldahl digestion to convert nitrogenous compounds to ammonia. Ammonia is determined
			colorimetrically by discrete analyser. This method is compliant with NEPM Schedule B(3)
Total Nitrogen as N (TKN + Nox) By	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3 This method is compliant with NEPM Schedule B(3)
Discrete Analyser			
Total Phosphorus as P By Discrete	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid
Analyser			digestion of a sample aliquot to break phosphorus down to orthophosphate. The orthophosphate reacts with
			ammonium molybdate and antimony potassium tartrate to form a complex which is then reduced and its
			concentration measured at 880nm using discrete analyser. This method is compliant with NEPM Schedule B(3)
Field Tests (performed by external	* EN67-B02	WATER	Field determinations as per methods described in APHA or supplied by client. The analysis is performed in the
sampler)			field by non-ALS samplers. ALS NATA accreditation does not apply for this service.
Thermotolerant Coliforms & E.coli by	MW006	WATER	AS 4276.7
Membrane Filtration			
Enumeration of Enterococci by	MW023	WATER	AS4276.9
Membrane Filtration			
Preparation Methods	Method ♦	Matrix	Method Descriptions
TKN/TP Digestion	EK061/EK067	WATER	In house: Referenced to APHA 4500 Norg - D; APHA 4500 P - H. This method is compliant with NEPM Schedule
			B(3)
Digestion for Total Recoverable Metals	EN25	WATER	In house: Referenced to USEPA SW846-3005. Method 3005 is a Nitric/Hydrochloric acid digestion procedure
			used to prepare surface and ground water samples for analysis by ICPAES or ICPMS. This method is compliant
			with NEPM Schedule B(3)
Digestion for Total Recoverable Metals -	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to
ORC			prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM
			Schedule B(3)

ALS)	CHAIN OF CUSTODY ALS Laboratory: please tick →	Ph 05 6359 239RISBANE 2 Byth Gre Ph 57 0240 7020 F san LK3 ADSTONE 48 Called	9890 Er adolt et Stafford Oc plas, brisbasie mondah Driw	Galugiobal.com Ph. 05 8649 6630 E. samples meloou	inal som sangvate +%, i unesgersgiobi nee MSIC(285)	st.com	يون چر	UNEWCASTIC Ph. 02 4669 94 DWRA 4/13 Ge 02 44 33 2061 6 CRYH 10 Hod V 08 9709 7655 E	ary Place Noria E <i>now</i> ra@aitick Vay Makiga 1924	enca de@aragi Nova e NGAV 05 skal.com +6096	iobal com 541	Ph 02 8784 8565 LITOWNSVILLE 14 Ph. 51 4796 0600 E	Er samples og 16 Desirta Cr 1944 – Fri 20 Senriy Stre	Z4/4 densy @utupotesticoni adensy @utupotesticoni num textus 0.2013 AB18 numoroscitus 1.2016 and at Walkergong su SVM 1550 Patriotesti at 1.2016
CLIENT: TRILITY OFFICE: AGNES W/ PROJECT: GROUNDW/		PROJECT NO.:	TURNAR (Stendard 1	OUND REQUIREMENTS : Standar AT may be longer for some tests Non Star race Organics) Non Star	d TAT (List			):	ENCENUMB		F C	FOR LABORATORY U Sustody Seal Intact?	ISE ONLY	(Circle) Yes No N/
ORDER NUMBER:	PURCHASE ORDER N		ļ	Y OF ORIGIN:			COC:		34	5 6		eccipt? tandom Sample Tempera	ture on Rec	eipt: °C
PROJECT MANAGER:	( 6) Personal info	CONTACT P	H: DL:+6	1 7 49757975   M: 6) Personal info			OF:	1 2	3 4	56	7 0	lither comment		
SAMPLER: 6) Persor	nal info	SAMPLER M	IOBILE:	Personal i			REC	EIVED BY	Persona	il in	RELIN	QUISHED BY:	1	RECEIVED BY:
COC Emailed to ALS?	YES NO)	EDD FORMA	T (or defa	u#): h4p4( 6	i) Persoi	nal informa	tiq	Ľ	2441	25				
Email Reports to :Pers	onal <sup>t</sup> rility.com.au; awatergroup@	trility.com.au		D/	1.1.00	20	DATE	e/time:	0831		DATE	TME:		DATE/TIME:
Email Invoice to (will de	fault to PM if no other addresses are	listed): accountspayable(	Strility.com	n.au 20.04/2021	143	<u>90                                    </u>		$\overline{\mathbf{C}}$	000		l			
COMMENTS/SPECIAL H	IANDLING/STORAGE OR DISPOSA	L: Toll Connote no. is MYTH	779406											
ALS USE ONLY		E DETAILS olid(S) Water(W)		CONTAINER INFORMATION								be listed to attract suite pr 1 (field filtered bottle requir		vironmental Division
LABID	SAMPLE ID	DATE / TIME	MATRIX		TOTAL	TABLE 1	Temp Field	DO Fleid	EC Fleid µs/cm	pH Fleid	ORP Field			risbane Work Order Reference EB2110810
1	· STP1	2010412021 0948	W		5	х	24.1	0.28	3778	6.56	6.2	2	Te	elephone : + 61-7-3243 7222
2	STP2	20/04/2021 1125	w		5	х	24.1	0.49	11752	6.38	68.	5		
3	97-01	20/04/2021 1215	w	00	5	x	21.8	2.48	377	5.75	133	0		
4	<b>57-2</b>		w											Ran dry after purging and did not recover.
5	97-3		w	-		Lui anno 1	میں اور این ایک	an a	and the state of the second states of the					Ran dry after purging and did not recover.
6	97-4	N 1	w						$\bigcirc$	AB.	1.1.1			Ran dry after purging and did not recover.
7	97-5		w							** * -********************************				Ran dry after purging and did not recover.
8	007		w											Ran dry after purging and did not recover.
3	008		w											Ran dry after purging and did not recover.
204	STP1 Duplicate	20/04/2021 0952	W		5	x	24.1	0.28	3778	6.56	6.2	2		
											<u> </u>			
			J	TOTAL	20	· · ·								<del></del>
				Sodium Hydroxide/Cd Preserved; S = Sodium Hydro freight Unpreserved Vial SG = Sulfuric Preserved, Ar te Solis; B = Unpreserved Bag; Li = Lugois Iodine IPG									= Formaldel	nyde Preserved Glass; Page 79 of 200

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# **CERTIFICATE OF ANALYSIS**

Work Order	EB2111108	Page	: 1 of 4
Client	TRILITY Pty Ltd	Laboratory	Environmental Division Brisbane
Contact	p4( 6) Personal inform	Contact	: Customer Services EB
Address	LOT 40 SPRINGS ROAD	Address	: 2 Byth Street Stafford QLD Australia 4053
	AGNES WATER QLD 4677		
Telephone	: 0749757975	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 23-Apr-2021 08:30
Order number	: 4500067182	Date Analysis Commenced	: 23-Apr-2021
C-O-C number	:	Issue Date	: 04-May-2021 12:00
Sampler	: Ip4( 6) Personal informa		Iac-MRA NATA
Site		$\sim$	
Quote number	: BN/222/16	S	Accreditation No. 825
No. of samples received	: 4	0	Accredited for compliance with
No. of samples analysed	: 4		ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

(6) Personal info

Senior Inorganic Chemist Senior Inorganic Chemist Senior Inorganic Chemist Microbiologist

Brisbane Inorganics, Stafford, QLD Brisbane Administration, Stafford, QLD Brisbane Inorganics, Stafford, QLD Brisbane Microbiological, Stafford, QLD



#### **General Comments**

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Where a result is required to meet compliance limits the associated uncertainty must be considered. Refer to the ALS Contact for details.

- Key: CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society. LOR = Limit of reporting
  - ^ = This result is computed from individual analyte detections at or above the level of reporting
  - ø = ALS is not NATA accredited for these tests.
  - $\sim$  = Indicates an estimated value.
- EK067G (Total Phosphorus as P): Some samples were diluted due to matrix interference. LOR adjusted accordingly.
- ED041G (Sulfate (Turbidimetric) as SO4 2-) / EK057G (Nitrite as N): Some samples were diluted due to matrix interference. LOR adjusted accordingly.
- MF = membrane filtration
- CFU = colony forming unit
- Microbiological Comment: In accordance with ALS work instruction QWI-MIC/04, membrane filtration result is reported an approximate (~) when the count of colonies on the filtered membrane is outside the range
  of 10 100cfu.
- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for some samples. However, the difference is within experimental variation of the methods.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.



# Analytical Results

	DESAL 1	DESAL 2	DESAL 8	DESAL 1 Duplicate	
	u 22-Apr-2021 09:28	22-Apr-2021 10:35	22-Apr-2021 12:30	22-Apr-2021 09:32	
	EB2111108-( ( 1	EB2111108-((2	EB2111108-((8	EB2111108-((0	
	Result	Result	Result	Result	
urbidimetric7as SO0 2- by DA					
	ng/L <5	<5	44	<5	
by Discrete Analyser					
	ng/L <b>113</b>	08	404	113	
Getals by ICP-GS		2			
	mg/L <b>1.( 0</b>	( .83	( .8(	1.(3	
7440-38-2 0.001	mg/L <0.001	<0.001	(.((1	<0.001	
7440-43-9 0.0001	ng/L <0.0001	<0.0001	<0.0001	<0.0001	
	mg/L (.((1	<0.001	(.((1	(.((1	
	ng/L (.((1	<0.001	<0.001	(.((1	
7440-48-4 0.001	ng/L <0.001	<0.001	(.((1	<0.001	
7440-02-0 0.001	mg/L <0.001	<0.001	( .( ( 0	<0.001	
7439-92-1 0.001	mg/L <0.001	<0.001	<0.001	<0.001	
7440-66-6 0.005	mg/L <0.005	<0.005	<0.005	<0.005	
7439-96-5 0.001	mg/L (.(11	(.((5	( .( 5M	( .( 12	
7782-49-2 0.01	mg/L <0.01	<0.01	<0.01	<0.01	
7440-31-5 0.001	mg/L <0.001	<0.001	<0.001	<0.001	
7439-89-6 0.05	ng/L (.38	(.8M	1( .(	( .30	
als by ICP-GS					
	mg/L 1.( 2	( .0(	( .8(	1.( 0	
7440-38-2 0.001	ng/L <0.001	<0.001	(.((1	<0.001	
7440-43-9 0.0001	ng/L <0.0001	<0.0001	<0.0001	<0.0001	
7440-47-3 0.001	ng/L (.((1	<0.001	<0.001	(.((1	
7440-50-8 0.001	mg/L (.((2	<0.001	<0.001	(.((1	
7440-48-4 0.001	mg/L <0.001	<0.001	(.((1	<0.001	
7440-02-0 0.001	mg/L (.((3	<0.001	0)).)	<0.001	
7439-92-1 0.001	mg/L <0.001	<0.001	<0.001	<0.001	
7440-66-6 0.005	mg/L (.( 22	<0.005	<0.005	<0.005	
7439-96-5 0.001	mg/L (.(11	(.((5	( .( 52	( .( 11	
7782-49-2 0.01	mg/L <0.01	<0.01	<0.01	<0.01	
7440-31-5 0.001	mg/L <0.001	<0.001	<0.001	<0.001	
7440-42-8 0.05	mg/L (.(3	<0.05	(.1(	( .( 3	
7439-89-6 0.05	mg/L (.30	( .8M	5.M4	( .Z1	
Gercury by FIGS					
7439-97-6 0.0001		<0.0001	<0.0001	<0.0001	 Page 82 of 200
Gercury by FIGS		0001 mg/L <0.0001		0001 mg/L <0.0001 <0.0001 <0.0001	0001 mg/L <0.0001 <0.0001 <0.0001 <0.0001



# Analytical Results

Sub-Matrix: WATER 9Matrix: WATER7			DESAL 1	DESAL 2	DESAL 8	DESAL 1 Duplicate	
		и	22-Apr-2021 09:28	22-Apr-2021 10:35	22-Apr-2021 12:30	22-Apr-2021 09:32	
			EB2111108-((1	EB2111108-( ( 2	EB2111108-((8	EB2111108-((0	
			Result	Result	Result	Result	
E) (84T: Total Recoverable Gercur	y by FIGS						
Gercury	7439-97-6 0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	
E) (50F: Dissolved Getals in Fresh	Water by ORC-ICPGS						
Silver	7440-22-4 0.01	µg/L	<0.01	<0.01	<0.01	<0.01	
E) (50T: Total metals in Fresh wate	r by ORC-ICPGS						
Silver	7440-22-4 0.01	µg/L	<0.01	<0.01	<0.01	<0.01	
EK(44) : Ammonia as N by Discrete	e Analyser			C.			
Ammonia as N	7664-41-7 0.01	mg/L	( M ). )	(.(4	1.30	( .12	
EK( 4Z) : Nitrite as N by Discrete A	nalyser						
Nitrite as N	14797-65-0 0.01	mg/L	<0.05	<0.05	<0.01	<0.05	
EK(4M): Nitrate as N by Discrete A	nalyser						
Nitrate as N	14797-55-8 0.01	mg/L	( .48	(.85	<0.01	( .45	
EK(45): Nitrite plus Nitrate as N 9	NOx7 by Discrete Analyser						
Nitrite + Nitrate as N	0.01	mg/L	( .48	( .85	<0.01	( .45	
EK( 31) : Total Kjeldahl Nitrogen By	/ Discrete Analyser						
Total Kjeldahl Nitrogen as N	0.1	mg/L	1.Z	(.3	2.1	1.M	
EK(32): Total Nitrogen as N 9ТКN +	+ NOx7by Discrete Analyser						
^ Total Nitrogen as N	0.1	mg/L	2.2	1.(	2.1	2.0	
EK( 3Z) : Total Phosphorus as P by	Discrete Analyser						
Total Phosphorus as P	0.01	mg/L	<0.05	( .10	( .( 4	<0.05	
EN3Z: Field Tests		12					
Ø pH	0.01	pH Unit	0.1(	0.( 5	0.44	0.1(	
ø Redox Potential	0.1	mV	-2(	110	-180	-2(	
Ø Temperature	0.1	°C	24.5	20.4	2Z.2	24.5	
Ø Electrical Conductivity	COND_TEMP 1	μS/cm	048	155	1ZZ2	048	
9Temperature Compensated7			( <b>1</b> 0				
Ø Field Dissolved Oxygen	0.1	mg/L	(.18	( .24	1.Z4	( .18	
GW((3: Faecal Coliforms & E.coli b							
Faecal Coliforms	1	CFU/100mL	<1	<1	<1	<1	
GW( 28: Enterococci by Gembrane							
Enterococci	1	CFU/100mL	<1	<1	<1	<1	



# QUALITY CONTROL REPORT

Work Order	: <b>EB2111108</b>	Page	: 1 of 7
Client Contact	: <b>TRILITY Pty Ltd</b> 4( 6) Personal inforn	Laboratory Contact	: Environmental Division Brisbane : Customer Services EB
Address	LOT 40 SPRINGS ROAD	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	AGNES WATER QLD 4677 : 0749757975	Telephone	2:+61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 23-Apr-2021
Order number	: 4500067182	Date Analysis Commenced	: 23-Apr-2021
C-O-C number	:	Issue Date	: 04-May-2021
Sampler	p4( 6) Personal inform		HAC MBA NATA
Site	:	. 6	
Quote number	: BN/222/16		Accreditation No. 825
No. of samples received	: 4		Accredited for compliance with
No. of samples analysed	: 4		ISO/IEC 17025 - Testing

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted, unless the sampling was conducted by ALS. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Method Blank (MB) and Laboratory Control Spike (LCS) Report; Recovery and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits

This document has been electronically signed by the authorized signatories below. Electronic signing is carried out in compliance with procedures specified in 21 CFR Part 11.

6) Personal info

Senior Inorganic Chemist Senior Inorganic Chemist Senior Inorganic Chemist Microbiologist

Brisbane Inorganics, Stafford, QLD Brisbane Administration, Stafford, QLD Brisbane Inorganics, Stafford, QLD Brisbane Microbiological, Stafford, QLD



#### **General Comments**

The analytical procedures used by ALS have been developed from established internationally recognised procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are fully validated and are often at the client request.

Where moisture determination has been performed, results are reported on a dry weight basis.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis. Where the LOR of a reported result differs from standard LOR, this may be due to high

Key : Anonymous = Refers to samples which are not specifically part of this work order but formed part of the QC process lot

CAS Number = CAS registry number from database maintained by Chemical Abstracts Services. The Chemical Abstracts Service is a division of the American Chemical Society.

LOR = Limit of reporting

RPD = Relative Percentage Difference

# = Indicates failed QC

#### Laboratory Duplicate (DUP) Report

The quality control term Laboratory Duplicate refers to a randomly selected intralaboratory split. Laboratory duplicates provide information regarding method precision and sample heterogeneity. The permitted ranges for the Relative Percent Deviation (RPD) of Laboratory Duplicates are specified in ALS Method QWI-EN/38 and are dependent on the magnitude of results in comparison to the level of reporting: Result < 10 times LOR: No Limit; Result between 10 and 20 times LOR: 0% - 50%; Result > 20 times LOR: 0% - 20%.

Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report						
aboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)	
D401G: Sulfate (Tu	rbidimetric) as SO0 2- by DA	(QC Lot: 8304604)								
B2111179-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1250	1270	1.20	0% - 20%	
B2111179-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	100	99	1.47	0% - 20%	
D406G: C7loride b	y Discrete A5alyser (QC Lot	: 8304601)	20							
B2111179-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1280	1280	0.130	0% - 20%	
G424h: Dissolned I	Fetals by ICP-FS (QC Lot: 8	3046v2)								
B2111187-002	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit	
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.002	0.002	0.00	No Limit	
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.207	0.210	1.43	0% - 20%	
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit	
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.04	0.04	0.00	No Limit	
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit	
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.23	0.23	0.00	No Limit	
32111145-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit	
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit	
22-265		EG020A-F: Lead	7439-92-1 File C	0.001	mg/L	<0.001	<0.001	0.00 Bee	e 85 of 200	

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Work Order	: EB2111143
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Sub-Matrix: WATER				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG424h: Dissolned I	Fetals by ICP-FS (QC	CLot: 83046v2) - co5ti5ued							
EB2111145-001	Anonymous	EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.064	0.064	0.00	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.006	0.006	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EG424T: Total F etal	s by ICP-F S (QC Lot:	83043M4)		(	2				
EB2111085-010	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0005	< 0.0005	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	< 0.005	< 0.005	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	< 0.005	< 0.005	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.017	0.018	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	< 0.005	< 0.005	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	< 0.005	< 0.005	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	1.04	1.07	3.02	0% - 20%
	EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.013	0.014	0.00	No Limit	
	EG020A-T: Tin	7440-31-5	0.001	mg/L	< 0.005	< 0.005	0.00	No Limit	
	EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.026	0.050	61.4	No Limit	
	EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.57	0.65	12.4	0% - 50%	
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	4.33	4.44	2.43	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	30.3	30.6	0.946	0% - 20%
EB2111143-001	DESAL 1	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	< 0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	< 0.001	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.001	0.001	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	< 0.001	<0.001	0.00	No Limit
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	< 0.001	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.011	0.010	0.00	0% - 50%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.006	0.002	90.9	No Limit
		EG020A-T: Tin	7440-31-5	0.001	mg/L	< 0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.022	0.008	94.5	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	1.02	1.01	0.00	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	0.06	0.06	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.64	0.65	0.00	0% - 50%
EG486h: Dissolned I	Fercury by hIF S (QC								
EB2111165-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	< 0.0001	<0.0001	0.00	No Limit
EB2111145-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	< 0.0001	<0.0001	0.00	No Limit
22.265		IF S (QC Lot: 830433M)	File C						e 86 of 200

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Client	: TRILITY Pty Ltd
Project	: GROUNDWATER MONITORING



Sub-Matrix: WATER						Laboratory I	Duplicate (DUP) Report		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	LOR	Unit	Original Result	Duplicate Result	RPD (%)	Acceptable RPD (%)
EG486T: Total Reco	onerable F ercury by	hIFS (QC Lot: 830433M) - co5ti5ued							
EB2111031-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2111143-003	DESAL 3	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
G490h: Dissolned	F etals i5 hres7 Wat	er by ORC-ICPF S (QC Lot: 83046v3)							
EB2111143-001	DESAL 1	EG094-AgF: Silver	7440-22-4	0.01	μg/L	<0.01	<0.01	0.00	No Limit
G490T: Total metal	ls i5 hres7 water by	ORC-ICPFS (QC Lot: 83043MB)			. (2)				
EB2111143-001	DESAL 1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
K466G: Ammo5ia	as N by Discrete A5	alyser (QC Lot: 8361814)							
EB2111143-001	DESAL 1	EK055G: Ammonia as N	7664-41-7	0.01	P mg/L	0.08	0.08	0.00	No Limit
K46MG: Nitrite as I	N by Discrete A5aly	ser (QC Lot: 8304689)		2					
EB2111179-008	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.21	0.22	0.00	0% - 20%
EB2111179-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
K469G: Nitrite plu	s Nitrate as N (NOx)	by Discrete A5alyser (QC Lot: 8361849)							
B2111022-001	Anonymous	EK059G: Nitrite + Nitrate as N		0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB2111143-001	DESAL 1	EK059G: Nitrite + Nitrate as N	.6 7	0.01	mg/L	0.53	0.59	9.92	0% - 20%
K431G: Total Kjeld	la7l Nitroge5 By Dis	crete A5alyser (QC Lot: 830MB0v)		1					
EB2110470-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	19.9	19.6	1.39	0% - 20%
EB2111143-003	DESAL 3	EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	2.1	2.0	0.00	0% - 20%
K43MG: Total P7os	p7orus as P by Disc	crete A5alyser (QC Lot: 830MB0M)							
EB2110470-001	Anonymous	EK067G: Total Phosphorus as P		0.01	mg/L	2.76	2.74	0.673	0% - 20%
EB2111143-003	DESAL 3	EK067G: Total Phosphorus as P		0.01	mg/L	0.05	0.04	0.00	No Limit
		Publisheo							



#### Method Blank (MB) and Laboratory Control Sample (LCS) Report

The quality control term Method / Laboratory Blank refers to an analyte free matrix to which all reagents are added in the same volumes or proportions as used in standard sample preparation. The purpose of this QC parameter is to monitor potential laboratory contamination. The quality control term Laboratory Control Sample (LCS) refers to a certified reference material, or a known interference free matrix spiked with target analytes. The purpose of this QC parameter is to monitor method precision and accuracy independent of sample matrix. Dynamic Recovery Limits are based on statistical evaluation of processed LCS.

Sub-Matrix: WATER			Method Blank (MB)		Laboratory Control Spike (LCS) Report			
				Report	Spike	Spike Recovery (%)	Acceptat	le Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED401G: Sulfate (Turbidimetric) as SO0 2- by DA	(QCLot: 8304604)				6			
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.4	85.0	118
				<1	100 mg/L	96.1	85.0	118
ED406G: C7loride by Discrete A5alyser (QCLot:	8304601)							
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.2	90.0	115
				<1	1000 mg/L	105	90.0	115
EG424h: Dissolned F etals by ICP-F S (QCLot: 8	3046v2)			5				
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	94.6	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.7	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	94.9	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	92.8	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	96.1	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	90.4	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	92.1	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.8	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.3	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	102	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	99.6	86.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	94.7	87.0	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	94.6	82.0	114
EG424T: Total F etals by ICP-F S (QCLot: 83043	W4)							
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	88.9	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	93.0	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	89.4	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	94.1	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	90.5	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.3	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	94.9	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	91.2	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.6	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	106	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	96.8	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	87.8	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	128
EG020A-T: Ir <b>22-265</b>	7439-89-6	0.05	<sup>mg/L</sup> File C	<0.05	0.5 mg/L	97.2	Pade 88	of 200 <sup>118</sup>



Sub-Matrix: WATER			Method Blank (MB)	Laboratory Control Spike (LCS) Report				
				Report	Spike	Spike Recovery (%)	Acceptable	e Limits (%)
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
EG486h: Dissolned F ercury by hIF S (QCLot: 83046v8)					$\mathbf{A}$			
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	98.3	84.0	118
EG486T: Total Reconerable F ercury by hIF S (QCLot: 8304	33M)							
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	95.2	84.0	118
EG490h: Dissolned F etals i5 hres7 Water by ORC-ICPF S(	QCLot: 83046	/3)			3			
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	89.5	70.0	130
EG490T: Total metals i5 hres7 water by ORC-ICPF S (QCLo	ot: 83043MB)			S				
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	89.8	70.0	130
EK466G: Ammo5ia as N by Discrete A5alyser (QCLot: 8361	814)							
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	97.0	83.5	114
EK46MG: Nitrite as N by Discrete A5alyser (QCLot: 830468	9)			Nº O				
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	97.0	90.0	110
EK469G: Nitrite plus Nitrate as N (NOx) by Discrete A5alys	er (QCLot: 83	61849)						
EK059G: Nitrite + Nitrate as N		0.01	mg/L	<0.01	0.5 mg/L	96.2	85.7	111
EK431G: Total Kjelda7l Nitroge5 By Discrete A5alyser (QC	Lot: 830MB0v)							
EK061G: Total Kjeldahl Nitrogen as N		0.1	mg/L	<0.1	10 mg/L	89.8	70.1	108
EK43MG: Total P7osp7orus as P by Discrete A5alyser (QCL	_ot: 830MB0M)			)				
EK067G: Total Phosphorus as P		0.01	.mg/L	<0.01	4.42 mg/L	93.6	79.2	105

## Matrix Spike (MS) Report

The quality control term Matrix Spike (MS) refers to an intralaboratory split sample spiked with a representative set of target analytes. The purpose of this QC parameter is to monitor potential matrix effects on analyte recoveries. Static Recovery Limits as per laboratory Data Quality Objectives (DQOs). Ideal recovery ranges stated may be waived in the event of sample matrix interference.

Sub-Matrix: WATER	ub-Matrix: WATER				Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Acceptable	Limits (%)		
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High		
ED401G: Sulfate (	Turbidimetric) as SO0 2- by DA								
EB2111179-004	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	200 mg/L	70.2	70.0	130		
ED406G: C7loride	by Discrete A5alyser (QCLot: 8	304601)							
EB2111179-004	Anonymous	ED045G: Chloride	16887-00-6	4000 mg/L	95.1	70.0	130		
EG424h: Dissolne	d F etals by ICP-F S (QCLot: 830	)46v2)							
EB2111143-002	DESAL 2	EG020A-F: Arsenic	7440-38-2	1 mg/L	103	70.0	130		
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	101	70.0	130		
		EG020A-F: Chromium	7440-47-3	1 mg/L	92.6	70.0	130		
		EG020A-F: Cobalt	7440-48-4	1 mg/L	97.9	70.0	130		
		EG020A-F: Copper	7440-50-8	1 mg/L	93.8	70.0	130		
22-265		EG020A-F: Lead	7439-92-1	1 mg/L	100	70.0	f 200 <sup>130</sup>		
22-205		EG020A-F: Manganese	7439-96-5	1 mg/L	96.3	Page 89 o	130		



Sub-Matrix: WATER					Matrix Spike (MS) Report				
				Spike	SpikeRecovery(%)	Acceptable	Limits (%)		
aboratory sample ID.	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High		
EG424h: Dissolne	d F etals by ICP-F S (QCLot: 83046v2) - co5ti5ued								
EB2111143-002	DESAL 2	EG020A-F: Nickel	7440-02-0	1 mg/L	96.3	70.0	130		
		EG020A-F: Zinc	7440-66-6	1 mg/L	102	70.0	130		
EG424T: Total F et	tals by ICP-F S (QCLot: 83043M4)								
EB2111085-011	Anonymous	EG020A-T: Arsenic	7440-38-2	5 mg/L	105	70.0	130		
		EG020A-T: Cadmium	7440-43-9	1.25 mg/L	93.5	70.0	130		
		EG020A-T: Chromium	7440-47-3	5 mg/L	88.2	70.0	130		
		EG020A-T: Cobalt	7440-48-4	5 mg/L	89.6	70.0	130		
		EG020A-T: Copper	7440-50-8	5 mg/L	90.3	70.0	130		
		EG020A-T: Lead	7439-92-1	5 mg/L	95.0	70.0	130		
		EG020A-T: Manganese	7439-96-5	5 mg/L	88.0	70.0	130		
		EG020A-T: Nickel	7440-02-0	5 mg/L	92.6	70.0	130		
		EG020A-T: Zinc	7440-66-6	5 mg/L	92.1	70.0	130		
EG486h: Dissolne	d F ercury by hIF S (QCLot: 83046v8)								
EB2111143-002	DESAL 2	EG035F: Mercury	7439-97-6	0.01 mg/L	101	70.0	130		
G486T: Total Re	conerable F ercury by hIF S (QCLot: 830433M)								
EB2111058-007	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	95.6	70.0	130		
EK466G: Ammo5ia	a as N by Discrete A5alyser (QCLot: 8361814)								
EB2111143-002	DESAL 2	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	90.6	70.0	130		
EK46MG: Nitrite as	s N by Discrete A5alyser (QCLot: 8304689)								
EB2111179-004	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	114	70.0	130		
EK469G: Nitrite p	lus Nitrate as N (NOx) by Discrete A5alyser (QCLot: 83	361849)							
EB2111143-002	DESAL 2	EK059G: Nitrite + Nitrate as N		0.4 mg/L	88.5	70.0	130		
EK431G: Total Kje	elda7l Nitroge5 By Discrete A5alyser (QCLot: 830MB0v)								
EB2110470-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N		5 mg/L	84.1	70.0	130		
EK43MG: Total P7	osp7orus as P by Discrete A5alyser (QCLot: 830M80M)								
EB2110470-002	Anonymous	EK067G: Total Phosphorus as P		1 mg/L	97.7	70.0	130		



# QA/QC Compliance Assessment to assist with Quality Review

Work Order	: EB2111108	Page	: 1 of 7
Client	: TRILITY Pty Ltd	Laboratory	: Environmental Division Brisbane
Contact	4(6) Personal inform	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 23-Apr-2021
Site	:	Issue Date	: 04-May-2021
Sampler	4p4( 6) Personal informa	No5of samples received	4
Order number	: 4800067102	No5of samples analysed	: 4

This report is automatically generated by the ALS LIMS through interpretation of the ALS Quality Control Report and several Quality Assurance parameters measured by ALS. This automated reporting highlights any non-conformances, facilitates faster and more accurate data validation and is designed to assist internal expert and external Auditor review. Many components of this report contribute to the overall DQO assessment and reporting for guideline compliance.

11 1 ACt +

Brief method summaries and references are also provided to assist in traceability5

# **Summary of Outliers**

#### **Outliers : Quality Control Samples**

This report highlights outliers flagged in the ( uality Control )( Ck Report5

- <u>NO</u> Method Blank value outliers occur.
- <u>NO</u> Duplicate outliers occur.
- NO Laboratory Control outliers occur.
- <u>NO</u> Matrix Spike outliers occur.
- For all regular sample matrices, <u>NO</u> surrogate recovery outliers occur.

#### **Outliers : Analysis Holding Time Compliance**

• NO Analysis Holding Time Outliers exist.

#### **Outliers : Frequency of Quality Control Samples**

• <u>NO</u> Quality Control Sample Frequency Outliers exist.



# Analysis Holding Time Compliance

If samples are identified beloV as having been analysed or eqtracted outside of recommended holding times/ this should be taxen into consideration Vhen interpreting results5

This report summari, es eqtraction H preparation and analysis times and compares each Vith ALS recommended holding times )referencing USEPA SW Q46/ AP9 A/ AS and NEPMk based on the sample container provided5 Dates reported represent first date of eqtraction or analysis and preclude subse; uent dilutions and reruns5A listing of breaches )if anykis provided herein5

9 olding time for leachate methods )etg5 TCLPk vary according to the analytes reported5 Assessment compares the leach date Vith the shortest analyte holding time for the e; uivalent soil method5 These are: organics 14 days/ mercury 2Qdays w other metals 100 days5 A recorded breach does not guarantee a breach for all non-volatile parameters5

9 olding times for <u>VOC in soils</u> vary according to analytes of interest5 . inyl Chloride and Styrene holding time is 7 daysK others 14 days5 A recorded breach does not guarantee a breach for all . OC analytes and should be verified in case the reported breach is a false positive <u>or</u>. inyl Chloride and Styrene are not xey analytes of interestHoncern5

Matriq: WATER					Evaluation	n: × & 9 olding time	e breach K√ & Withi	n holding tin
Method	Sample Date	E	traction / Preparation			Analysis		
Container / Client Sample ID(s)			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED( 01) : Sulfate KTurbidimetricj as SO0 2- by DA		20						
Clear Plastic Bottle - Natural IED(01) j DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate	22-Apr-2( 21	9			20-Apr-2( 21	20-May-2021	~
ED( 04) : Chloride by Discrete Analyser			9					
Clear Plastic Bottle - Natural IED(04) j DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate	22-Apr-2( 21				20-Apr-2( 21	20-May-2021	~
E) ( 2( F: Dissolved Metals by ICP-MS		0						
Clear HDPE IG-T ORCj - Filtered5Lab-acidified IE) (2(A-F DESAL 1/ DESAL 3/	i DESAL 2/ DESAL 1 Duplicate	22-Apr-2( 21				2U-Apr-2( 21	1z-Oct-2021	~
E) (2(T: Total Metals by ICP-MS	$\dot{\mathbf{O}}$							
Clear HDPE IG-T ORCj - Gnfiltered5Lab-acidified IE) (2( DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate	22-Apr-2( 21	2; -Apr-2( 21	1z-Oct-2021	~	2; -Apr-2( 21	1z-Oct-2021	~
E) (84F: Dissolved Mercury by FIMS								
Clear HDPE IG-T ORCj - Filtered5Lab-acidified IE) (84Fj DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate	22-Apr-2( 21				8( -Apr-2( 21	20-May-2021	~
E) (84T: Total Recoverable Mercury by FIMS								
Clear HDPE IG-T ORCj - Gnfiltered5Lab-acidified IE) (841 DESAL 1/ DESAL 3/	i DESAL 2/ DESAL 1 Duplicate	22-Apr-2( 21				2U-Apr-2( 21	20-May-2021	~
E) ( U0F: Dissolved Metals in Fresh Water by ORC-ICPM								
Clear HDPE IG-T ORCj - Filtered5Lab-acidified IE) (U0-Ag DESAL 1/ DESAL 3/	Fj DESAL 2/ DESAL 1 Duplicate	22-Apr-2( 21				2U-Apr-2( 21	1z-Oct-2021	~
E) ( U0T: Total metals in Fresh water by ORC-ICPMS								
Clear HDPE KG-T ORCj - Gnfiltered5Lab-acidified KE) (U0- DESAL 1/ DESAL 3/ 22-265	AgTj DESAL 2/ DESAL 1 Duplicate File	22-Apr-2( 21 C	2; -Apr-2( 21	1z-Oct-2021	1	2; -Apr-2( 21	1z-Oct-2021 Page 92 of 20	<b>v</b>

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Worx Order	: EB2111143
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Project	: GROUNDWATER MONITORING



Matriq: WATER						Evaluation	n: 🗴 & 9 olding time	e breach K✓ & Withi	in holding tim
Method			Sample Date	Ex	traction / Preparation		Analysis		
Container / Client Sample ID(s)				Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
E3 ( 44) :Ammonia as N by Discrete Analyser					0				
Clear Plastic Bottle - Sulfuric Acid Æ3 ( 44) j DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate		22-Apr-2( 21		02		8( -Apr-2( 21	20-May-2021	~
E3 ( 47) : Nitrite as N by Discrete Analyser				.01					
Clear Plastic Bottle - Natural IE3 (47) j DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate		22-Apr-2( 21	S			20-Apr-2( 21	24-Apr-2021	~
E3 (4U) : Nitrite plus Nitrate as N KNOxj by Discrete An	alyser			<u>)</u>					
Clear Plastic Bottle - Sulfuric Acid IE3 (4U) j DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate		22-Apr-2(21				8( -Apr-2( 21	20-May-2021	~
E3 ( 91):Total 3 & Idahl Nitrogen By Discrete Analyser				0					
Clear Plastic Bottle - Sulfuric Acid Æ3 (91) j DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate	S	22-Apr-2( 21	2U-Apr-2( 21	20-May-2021	1	2U-Apr-2( 21	20-May-2021	~
E3 ( 97) : Total Phosphorus as P by Discrete Analyser			VV						
Clear Plastic Bottle - Sulfuric Acid Æ3 (97) j DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate		22-Apr-2( 21	2U-Apr-2( 21	20-May-2021	~	2U-Apr-2( 21	20-May-2021	~
MW( ( 9: Faecal Coliforms & E.coli by MF									
Sterile Plastic Bottle - Sodium Thiosulfate KMW( ( 9j DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate	0 P	22-Apr-2( 21				28-Apr-2( 21	23-Apr-2021	~
MW(28: Enterococci by Membrane Filtration									
Sterile Plastic Bottle - Sodium Thiosulfate KMW(28j DESAL 1/ DESAL 3/	DESAL 2/ DESAL 1 Duplicate	·	22-Apr-2( 21				28-Apr-2( 21	23-Apr-2021	~
	DUL				1			1	



# **Quality Control Parameter Frequency Compliance**

The folloVing report summarises the fre; uency of laboratory (C samples analysed Vithin the analytical lot)skin Vhich the submitted sample)skVas)Verek processed5Actual rate should be greater than or e; ual to the eqpected rate5A listing of breaches is provided in the Summary of Outliers5

Matriq: WATER				Evaluation	n: 🗴 & ( uality Co	ntrol fre; uency	not Vithin specification K√ & ( uality Contr	ol fre; uency Vithin specification
( uality Control Sample Type		C	ount		Rate (%)		Quality Control Specification	
Analytical Methods	Method	QC	Reaular	Actual	Expected	Evaluation		
Laboratory Duplicates )DUPk						Q. 1		
Ammonia as N by Discrete analyser	E=088G	1	8	2( .( (	1(.((	$\checkmark$	NEPM 2013 B3 w ALS ( C Standard	
Chloride by Discrete Analyser	ED048G	1	10	1(.((	1(.((	✓	NEPM 2013 B3 w ALS ( C Standard	
Dissolved Mercury by FIMS	EG038F	2	20	1( .( (	1(.((	✓	NEPM 2013 B3 w ALS ( C Standard	
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	20	1(.((	1(.((	~	NEPM 2013 B3 w ALS ( C Standard	
LoV-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG0z4-AgF	1	4	24.((	1(.((	~	NEPM 2013 B3 w ALS ( C Standard	
LoV-Level Total Silver in Fresh Water by ORC-ICPMS	EG0z4-AgT	1	4	24.((	1(.((	~	NEPM 2013 B3 w ALS ( C Standard	
Nitrite and Nitrate as N )NOqk by Discrete Analyser	E=08zG	2	20	1(.((	1(.((	✓	NEPM 2013 B3 w ALS ( C Standard	
Nitrite as N by Discrete Analyser	E=087G	2	1Q	11.11	1(.((	~	NEPM 2013 B3 w ALS ( C Standard	
Sulfate )Turbidimetrick as SO4 2- by Discrete Analyser	ED041G	2	10	2(.((	1(.((	~	NEPM 2013 B3 w ALS ( C Standard	
Total =jeldahl Nitrogen as N By Discrete Analyser	E=061G	2	18	18.88	1(.((	✓	NEPM 2013 B3 w ALS ( C Standard	
Total Mercury by FIMS	EG038T	2	12	19.97	1(.((		NEPM 2013 B3 w ALS ( C Standard	
Total Metals by ICP-MS - Suite A	EG020A-T	2	14	10.2U	1(.((	✓	NEPM 2013 B3 w ALS ( C Standard	
Total Phosphorus as P By Discrete Analyser	E=067G	2	17	11.79	1(.((	✓	NEPM 2013 B3 w ALS ( C Standard	
Laboratory Control Samples )LCSk								
Ammonia as N by Discrete analyser	E=088G	1	8	2( .( (	4.( (	1	NEPM 2013 B3 w ALS ( C Standard	
Chloride by Discrete Analyser	ED048G	2	10	2(.((	1(.((		NEPM 2013 B3 w ALS ( C Standard	
Dissolved Mercury by FIMS	EG038F		20	4.( (	4.( (	<ul> <li>✓</li> </ul>	NEPM 2013 B3 w ALS ( C Standard	
Dissolved Metals by ICP-MS - Suite A	EG020A-F	0 1	20	4.( (	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard	
LoV-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG0z4-AgF	1	4	24.((	4.((	~	NEPM 2013 B3 w ALS ( C Standard	
LoV-Level Total Silver in Fresh Water by ORC-ICPMS	EG0z4-AqT	1	4	24.( (	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard	
Nitrite and Nitrate as N )NOgkby Discrete Analyser	E=08zG	1	20	4.( (	4.( (		NEPM 2013 B3 w ALS ( C Standard	
Nitrite as N by Discrete Analyser	E=087G	1	1Q	4.49	4.( (		NEPM 2013 B3 w ALS ( C Standard	
Sulfate )Turbidimetrick as SO4 2- by Discrete Analyser	ED041G	2	10	2( .( (	1(.((		NEPM 2013 B3 w ALS ( C Standard	
Total =jeldahl Nitrogen as N By Discrete Analyser	E=061G	1	18	9.97	4.( (		NEPM 2013 B3 w ALS ( C Standard	
Total Mercury by FIMS	EG038T	1	12	; .88	4.( (		NEPM 2013 B3 w ALS ( C Standard	
Total Metals by ICP-MS - Suite A	EG020A-T	1	14	7.10	4.( (		NEPM 2013 B3 w ALS ( C Standard	
Total Phosphorus as P By Discrete Analyser	E=067G	1	17	4.; ;	4.( (		NEPM 2013 B3 w ALS ( C Standard	
Method Blanxs )MBk								
Ammonia as N by Discrete analyser	E=088G	1	8	2( .( (	4.( (	1	NEPM 2013 B3 w ALS ( C Standard	
Chloride by Discrete Analyser	ED048G	1	10	1(.((	4.( (		NEPM 2013 B3 w ALS ( C Standard	
Dissolved Mercury by FIMS	EG038F	1	20	4.( (	4.( (		NEPM 2013 B3 w ALS ( C Standard	
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	4.( (	4.( (		NEPM 2013 B3 w ALS ( C Standard	
LoV-Level Dissolved Silver in Fresh Water by ORC-ICPMS22-265	EG0z4-AgF	1	4	24.(( e C	4.( (	✓ ✓	NEPM 2013 B3 w ALS ( C Standard	Page 94 of 200

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Project	: GROUNDWATER MONITORING



Matriq: WATER				Evaluatio		ontrol fre; uency n	not Vithin specification K  < & ( uality Control fre; uency Vithin specification
( uality Control Sample Type			ount		Rate (%)	Evolvetion	Quality Control Specification
Analytical Methods	Method	00	Reaular	Actual	Expected	Evaluation	
Method Blanxs )MBk- Continued							
LoV-Level Total Silver in Fresh Water by ORC-ICPMS	EG0z4-AgT	1	4	24.( (	4.( (	-	NEPM 2013 B3 w ALS ( C Standard
Nitrite and Nitrate as N )NOqk by Discrete Analyser	E=08zG	1	20	4.( (	4.( (		NEPM 2013 B3 w ALS ( C Standard
Nitrite as N by Discrete Analyser	E=087G	1	1Q	4.49	4.( (		NEPM 2013 B3 w ALS ( C Standard
Sulfate )Turbidimetrick as SO4 2- by Discrete Analyser	ED041G	1	10	1(.((	4.( (	$O_1 \checkmark$	NEPM 2013 B3 w ALS ( C Standard
Total =jeldahl Nitrogen as N By Discrete Analyser	E=061G	1	18	9.97	4.( (	$\checkmark$	NEPM 2013 B3 w ALS ( C Standard
Total Mercury by FIMS	EG038T	1	12	; .88	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	14	7.10	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard
Total Phosphorus as P By Discrete Analyser	E=067G	1	17	4.; ;	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard
Matrig Spixes )MSk				(	-		
Ammonia as N by Discrete analyser	E=088G	1	8	2(.((	4.( (	<ul> <li>✓</li> </ul>	NEPM 2013 B3 w ALS ( C Standard
Chloride by Discrete Analyser	ED048G	1	10	1(.((	4.( (	1	NEPM 2013 B3 w ALS ( C Standard
Dissolved Mercury by FIMS	EG038F	1	20	4.((	4.( (	1	NEPM 2013 B3 w ALS ( C Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	20	4.( (	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard
Nitrite and Nitrate as N )NOqk by Discrete Analyser	E=08zG	1	20	4.( (	4.( (	1	NEPM 2013 B3 w ALS ( C Standard
Nitrite as N by Discrete Analyser	E=087G	1	1Q	4.49	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard
Sulfate )Turbidimetrick as SO4 2- by Discrete Analyser	ED041G	1	10	1(.((	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard
Total =jeldahl Nitrogen as N By Discrete Analyser	E=061G	1	18	9.97	4.( (	1	NEPM 2013 B3 w ALS ( C Standard
Total Mercury by FIMS	EG038T	1	12	; .88	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	14	7.10	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard
Total Phosphorus as P By Discrete Analyser	E=067G	10	17	4.; ;	4.( (	✓	NEPM 2013 B3 w ALS ( C Standard
	Publish	30	¢.,				



# **Brief Method Summaries**

The analytical procedures used by the Environmental Division have been developed from established internationally recogni, ed procedures such as those published by the US EPA/ AP9 A/ AS and NEPM5In house developed procedures are employed in the absence of documented standards or by client re; uest5The folloVing report provides brief descriptions of the analytical procedures employed for results reported in the Certificate of Analysis5Sources from Vhich ALS methods have been developed are provided Vithin the Method Descriptions5

Sulfate )Turbidimetrick as SO4 2- by			
Discrete Analyser	ED041G	WATER	In house: Referenced to AP9 A 4800-SO45 Dissolved sulfate is determined in a 0548um filtered sample5 Sulfate ions are converted to a barium sulfate suspension in an acetic acid medium Vith barium chloride5Light absorbance of the BaSO4 suspension is measured by a photometer and the SO4-2 concentration is determined by comparison of the reading Vith a standard curve5This method is compliant Vith NEPM Schedule B)3k
Chloride by Discrete Analyser	ED048G	WATER	In house: Referenced to AP9A 4800 CI - G5The thiocyanate ion is liberated from mercuric thiocyanate through se; uestration of mercury by the chloride ion to form non-ionised mercuric chloride5n the presence of ferric ions the librated thiocynate forms highly-coloured ferric thiocynate Vhich is measured at 400 nm AP9A seal method 2 017-1-L
Dissolved Metals by ICP-MS - Suite A	EG020A-F	WATER	In house: Referenced to AP9 A 3128KUSEPA SWQ46 - 6020/ ALS (WI-ENHEG0205 Samples are 0548µm filtered prior to analysis5 The ICPMS techni; ue utili, es a highly efficient argon plasma to ioni, e selected elements5lons are then passed into a high vacuum mass spectrometer/ Vhich separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector5
Total Metals by ICP-MS - Suite A	EG020A-T	WATER	In house: Referenced to AP9 A 3128KUSEPA SWQ46 - 6020/ ALS (WI-ENHEG0205 The ICPMS techni; ue utili, es a highly efficient argon plasma to ioni, e selected elements5lons are then passed into a high vacuum mass spectrometer/ Vhich separates the analytes based on their distinct mass to charge ratios prior to their measurement by a discrete dynode ion detector5
Dissolved Mercury by FIMS	EG038F	WATER	In house: Referenced to AS 3880/ AP9 A 3112 9 g - B )FloV-injection )SnCl2k)Cold . apour generationkAASk Samples are 0548µm filtered prior to analysis5 FIM-AAS is an automated flameless atomic absorption techni; ue5 A bromatelbromide reagent is used to oqidise any organic mercury compounds in the filtered sample5 The ionic mercury is reduced online to atomic mercury vapour by SnCl2 Vhich is then purged into a heated ; uart, cell5 ( uantification is by comparing absorbance against a calibration curve5 This method is compliant Vith NEPM Schedule B)3k5
Total Mercury by FIMS	EG038T	WATER	In house: Referenced to AS 3880/ AP9 A 3112 9 g - B )FloV-injection )SnCl2k)Cold . apour generationk AASk FIM-AAS is an automated flameless atomic absorption techni; ue5A bromatel <sup>th</sup> romide reagent is used to oqidise any organic mercury compounds in the unfiltered sample5 The ionic mercury is reduced online to atomic mercury vapour by SnCl2 Vhich is then purged into a heated ; uart, cell5 ( uantification is by comparing absorbance against a calibration curve5This method is compliant Vith NEPM Schedule B)3k5
LoV-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG0z4-AgF	WATER	In house: Referenced to AP9 A 3128KUSEPA SWQ46 - 6020 Samples are 0548µm filtered prior to analysis5 The ORC-ICPMS techni; ue removes interfering species through a series of chemical reactions prior to ion detection5 lons are passed into a high vacuum mass spectrometer/ Vhich separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector5This method is compliant Vith NEPM Schedule B)3K5
LoV-Level Total Silver in Fresh Water by ORC-ICPMS	EG0z4-AqT	WATER	In house: Referenced to AP9 A 3128KUSEPA SWQ46 - 60205 The ORC-ICPMS techni; ue removes interfering species through a series of chemical reactions prior to ion detection5lons are passed into a high vacuum mass spectrometer/ Vhich separates the analytes based on their distinct mass to charge ratios prior to measurement



Analytical Methods	Method	Matrix	Method Descriptions
Ammonia as N by Discrete analyser	E=088G	WATER	In house: Referenced to AP9 A 4800-N9 3 G Ammonia is determined by direct colorimetry by Discrete Analyser5
			This method is compliant Vith NEPM Schedule B)3k
Nitrite as N by Discrete Analyser	E=087G	WATER	In house: Referenced to AP9 A 4800-NO2- B5 Nitrite is determined by direct colourimetry by Discrete Analyser5
			This method is compliant Vith NEPM Schedule B)3k
Nitrate as N by Discrete Analyser	E=08QG	WATER	In house: Referenced to AP9 A 4800-NO3- F5Nitrate is reduced to nitrite by Vay of a chemical reduction folloVed
			by ; uantification by Discrete Analyser5 Nitrite is determined seperately by direct colourimetry and result for Nitrate
			calculated as the difference betVeen the tVo results5This method is compliant Vith NEPM Schedule B)3k
Nitrite and Nitrate as N )NOqk by Discrete	E=08zG	WATER	In house: Referenced to AP9 A 4800-NO3- F5 Combined oqidised Nitrogen )NO2+NO3k is determined by
Analyser			Chemical Reduction and direct colourimetry by Discrete Analyser5This method is compliant Vith NEPM
			Schedule B)3k
Total =jeldahl Nitrogen as N By Discrete	E=061G	WATER	In house: Referenced to AP9A 4800-Norg D )In housek5An ali; uot of sample is digested using a high
Analyser			temperature =jeldahl digestion to convert nitrogenous compounds to ammonia5 Ammonia is determined
			colorimetrically by discrete analyser5This method is compliant Vith NEPM Schedule B)3k
Total Nitrogen as N )T=N + NoqkBy	E=062G	WATER	In house: Referenced to AP9 A 4800-Norg H4800-NO3-5This method is compliant Vith NEPM Schedule B)3k
Discrete Analyser			
Total Phosphorus as P By Discrete	E=067G	WATER	In house: Referenced to AP9A 4800-P 9 / Jirxa et al/ Zhang et al5 This procedure involves sulphuric acid
Analyser			digestion of a sample ali; uot to breax phosphorus doVn to orthophosphate5 The orthophosphate reacts Vith
			ammonium molybdate and antimony potassium tartrate to form a compleq Vhich is then reduced and its
			concentration measured at QQDnm using discrete analyser5This method is compliant Vith NEPM Schedule B)3k
Field Tests )performed by eqternal	* EN67-B02	WATER	Field determinations as per methods described in AP9A or supplied by client5 The analysis is performed in the
samplerk			field by non-ALS samplers5 ALS NATA accreditation does not apply for this service5
Thermotolerant Coliforms w E5coli by	MW006	WATER	AS 427657
Membrane Filtration			
Enumeration of Enterococci by	MW023	WATER	AS427652
Membrane Filtration			
Preparation Methods	Method	Matrix	Method Descriptions
T=NHP Digestion	E=061HE=067	WATER	In house: Referenced to AP9 A 4800 Norg - DKAP9 A 4800 P - 95This method is compliant Vith NEPM Schedule
			B)3k
Digestion for Total Recoverable Metals	EN28	WATER	In house: Referenced to USEPA SWQ46-30085 Method 3008 is a Nitricley ydrochloric acid digestion procedure
			used to prepare surface and ground Vater samples for analysis by ICPAES or ICPMS5 This method is compliant
			Vith NEPM Schedule B)3k
Digestion for Total Recoverable Metals -	EN28-ORC	WATER	In house: Referenced to USEPA SWQ46-30085 This is an Ultrapure Nitric acid digestion procedure used to
ORC			prepare surface and ground Vater samples for analysis by ORC- ICPMS5 This method is compliant Vith NEPM
			Schedule B)3k

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A	CHAIN OF CUSTOD ALS Laboratory: please tick →	TIBR(SB) Ph: CT 32		, brisbane@atsglobal.conFR: 03 8519 56	2 2-4 #vestall Road . 00 E: samples.melb	Spragrale V4. icume@atsplob	plicont	UBENCACTLES Rose Cam Providianteror NOM 22 Ph. 2014998433 El samples revecastle@elsglobal.com LICONINA113 Cesty Piace North Poster NOM 2541 Ph. 02.4423-0063 El novra@elsglobal.com				igʻobal.com NSH( 2641	<ul> <li>Pril 02 8784 8565 El samples cyclosy@alstyr.coal.com</li> <li>Lif GWHSWELE 14-15 Desires Count Bable OLD 4818</li> <li>Phil 07 4796 0800 El tradicionent of a manimum price on a man</li> </ul>		
		LiGLADS1 Ph: 87 497	ONE 48 Callemond 8 7944 E: ALSEnvi	lah Drive Clinton QLD 468010D388 1.2 ro.gladstone@alsgiobal.com20072.67	Nogee NCW 2800 LPERTH 13 Hot Way Malage WA 5050 Againg ball com Phy 08 3209 7655 Er samples perh@alsglobal.com					dial.com					
CLIENT: TRILITY		······		ROUND REQUIREMENTS :	🛛 Standa	and TAT (List	due date):					FOR L	ABORATORY USE O	NLY (Circle)	
OFFICE: AGNES W				TAT may be longer for some tests Trace Organics)	Non St	andard or u	gent TAT (List	due date	):				y Seal Intact?	Yes No	o N/A
PROJECT: GROUNDW		PROJECT NO.:		OTE NO.: BN/222/16			·		COC SEQU	ENCE NUME	BER (Circle	Free ice receipt?	e / frozen ice bricks presei ?	itupon Yes No	o N/A
ORDER NUMBER:	PURCHASE ORDER			RY OF ORIGIN:					12	3 4	56		n Sample Temperature or	Receipt: °C	
PROJECT MANAGER: SAMPLER: 6) Persor	β) Personal in			61 7 49757975   M: 6) Perso	nal inf			OF:	1 2	3 4	5 6	7 Other c			
COC Emailed to ALS?			RMAT (or def	) Personal int		6) Doroo	ool informo		EIVED BY:			RELINQUIS	HED BY:	RECEIVED BY:	
	na@trility.com.au Personal iptr	····			D	o) Perso	nal informa		e/TIME:	23/4/2	LA	DATE/TIME:		DATE/TIME:	
	ault to PM if no other addresses an		able@trillity.co		22/04/2021	140	$\mathcal{D}$		0	0830				Brite time.	
COMMENTS/SPECIAL H	IANDLING/STORAGE OR DISPOS	AL:					//					I		······································	an
ALS USE ONLY		*LE DETAILS Solid(S) Water(W)		CONTAINER IN	FORMATION								ed to altract suite price) Nared bottle required),	Additional Inform	ation
LÁBID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVA (refer to codes bek		TOTAL BOTTLES	TABLE 1	Temp Field	DO Field	EC Field µs/cm	pH Field	ORP Field		Comments on fikely contaminant diktions, or samples requiring sp analysis etc. Please add field results to COA	pecific QC
1	DESAL 1	22/04/2021 0924	3 w			5	x	25.9	0.13	453	4.10	r-20			,
. 2	DESAL 2	22/04/2021 103:	5 w		$\land$	5	x	24.5	0.25	199	4.09	114		· · · ·	
3	DESAL 3	22/04/2021 23	> ~			5	x	27.2	1.75	1772	4.55	-134			
4	DESAL 1 Duplicate	22104/2021 093	2 *	*		5	x	25.9	0.13	453	4.10	-20	Brisband Work C B	order Reference 2111143	
	· · · · · · · · · · · · · · · · · · ·												Telephone :	+ 61-7-3243 7222	
													1		j –
Status Coursian Contra Co	- Desenance Transfer Distance (***				TOTAL	20									
V = VOA Vial HCI Preserved; 2 = Zinc Acetate P99e967	= Unpreserved Plastic; N = Nitric Presen VB = VOA Vial Sodium Bisulphate Prese ottle; E = EDTA Preserved Boltles; ST =	ved Hasel, OnC = Matc Pres wed; VS = VOA Vial Sulfuric Pr Sterile Bottle; ASS = Plastic B	eserved, AV = Ai log for Acid Sulpha	<ul> <li>- Source Hydroxide/Cd Preserved;</li> <li>rfreight Unpreserved Vial SG = Sufficiency</li> <li>Soils; B = Unpreserved Bag; U =</li> </ul>	s = Soaum Hydr uric Preserved A Lugols locin	roxine Preser unber Glass; @s@ved Bottl	red Plastic; AG = H = HCI preserve es; STT = Sterile	Amper Gl ed Plestic; Sodium T	ess Unpresen HS = HCI pre hiosulfate Pre	red; AP - Airfi eserved Spec served Bottle	reight Unpresi iation bottle: { s.	aved Plastic SP = Sulfuric Pre	served Plastic; F = Form	Idehyde Preserved Glass; Page 98 of 200	

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# **Annual Monitoring Report**

Title	Annual Monitoring Report 2021		
Environmental Authority	EPPR00959913	Locations	South Trees WWTP, Agnes Water WWTP, Gladstone WWTP, Tannum Sands WWTP, and Alf Larson WWTP
Monitoring Period	1 <sup>st</sup> January 2021 – 31 <sup>st</sup> December 2021	Prepared By	Niru Vemuri

## Purpose:

The purpose of this report is to fulfill the requirements outlined in condition G5-ST, G21-AW, G6-GL, G8-TS and G8-ALF of the Environmental Authority EPPR00959913;

## **Definitions/Acronyms:**

Term/Acronym	Meaning							
DES	Department of Environment and Science							
EA	Environmental Authority							
GRC	Gladstone Regional Council							
STP	Sewage Treatment Plant (synonymous with Wastewater Treatment Plant)							
PUDIS	ned officially							

1110

Part 1 – Nutrient mass load calculations & discharge volume data – see below pages

Published of RTI Act 2009

· · · · · · · · · · · · · · · · · · ·							
Location	Date of Non Compliance Observed	Parameter	Limit	Result	Comments		
STD3	12/05/2021	Dissolved oxygen	Minimum 2mg/L	0.9	C-CPLRC-100094040 During maintenance on the Rotork valve controller, the South Trees weir fell, emptying a volume of the oxidation ditch to the discharge infrastructure (and the environment). A sample was quickly collected by an operator who was on site at the time of the incident - this sample had a decreased dissolved oxygen, as the aerators would have been turned off during the maintenance (and otherwise no decanting/discharging to the environment was planned while the maintenance was occurring).		
RP1 Agnes Water WWTP	7/04/2021	E. coli	1000 MPN/100mL	23000 (licence median value for 5 samples was 4,700)	C-CPLRC-100089517 "The E.coli reading of 23,000 triggering the initial incident notification has been attributed to a potential sampling and/or lab analysis error – as lagoon re- sampling undertaken on the 16th of April returned an E.coli reading of <1MPN/100ml. Council acknowledge delays caused by the 7-9 day turn-around time (TAT) for E.coli analysis (i.e. transport to external NATA laboratory, plus incubation times etc.). Expediting of the analysis with the laboratory would still reap a 5-day delay between sampling date and return of results."		
	14/10/2021			48 mg/L	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the non-		
	8/12/2021		2	2	> 2	7.6 mg/L	compliances, is planned to be turned offline while major corrective actions are outworked.
Alf Larson STP Effluent	15/12/2021	Total Phosphorus	7 mg/L	34 mg/L	C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended period, due to a combination of the following factors; - influent flows to site exceeding plant's treatment capacity, - 'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers), - unreported/under-reported failure/defects of site equipment by contractors, - sampling & reporting errors by operator - Improper change management (change of contractor)		
	22/12/2021			28 mg/L			

Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments
	20/08/2021			51.5 mg/L	
	1/09/2021			74.4 mg/L	
Alf Larson STP Effluent	15/09/2021	Total Nitrogen 30 mg/L	30 mg/L	124.5 mg/L	, 00
	7/10/2021			160 mg/L	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the non-
	14/10/2021			510 mg/L	compliances, is planned to be turned offline while major corrective actions are outworked. C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended
	21/10/2021			85 mg/L	<ul> <li>period, due to a combination of the following factors;</li> <li>influent flows to site exceeding plant's treatment capacity,</li> <li>'shock loading' from dumping of prohibited chemicals</li> </ul>
	28/10/2021			36 mg/L	<ul> <li>into the adjacent caravan dump point (by customers),</li> <li>unreported/under-reported failure/defects of site equipment by contractors,</li> <li>sampling &amp; reporting errors by operator</li> <li>Improper change management (change of contractor)</li> </ul>
	4/11/2021			410 mg/L	New Contractor from September 2021.
	11/11/2021			44 mg/L	
	25/11/2021			38 mg/L	
	2/12/2021			38 mg/L	

	Detc of No.				
Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments
	8/12/2021	_ Total Nitrogen	30 mg/L	42 mg/L	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the non- compliances, is planned to be turned offline while major corrective actions are outworked.
	15/12/2021			54 mg/L	C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended period, due to a combination of the following factors; - influent flows to site exceeding plant's treatment capacity, - 'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers), - unreported/under-reported failure/defects of site equipment by contractors, - sampling & reporting errors by operator - Improper change management (change of contractor)
Alf	22/12/2021			47 mg/L	
Larson	29/09/2021	_		2500	
STP Effluent	7/10/2021			μs/cm 3000 μs/cm	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the nor
	14/10/2021	Electrical Conductivity	2500µs/cm	3800 μs/cm	major corrective actions are outworked. C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended period, due to a combination of the following factors; - influent flows to site exceeding plant's treatment capacity, - 'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers), - unreported/under-reported failure/defects of site equipment by contractors, - sampling & reporting errors by operator - Improper change management (change of contractor) Exceedances were not discovered by GRC until July
	29/09/2021	рн	6.5-8.0	8.1	2022. The site is wholly contractor operated and maintained - and at present, since discovering the non-compliances, is planned to be turned offline while
	7/10/2021			8.4	major corrective actions are outworked.
Alf Larson STP Effluent	14/10/2021			8.4	C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended period, due to a combination of the following factors; - influent flows to site exceeding plant's treatment capacity, - 'shock loading' from dumping of prohibited chemicals
	15/12/2021			6	<ul> <li>into the adjacent caravan dump point (by customer - unreported/under-reported failure/defects of sine equipment by contractors,</li> <li>- sampling &amp; reporting errors by operator</li> <li>- Improper change management (change of contractor)</li> </ul>
Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments

Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments											
Larson STP Effluent	07/10/2021	E.coli	<10 CFU/100 ml	<10 MPN/100 ml	CFU/100ml											
Alf	29/09/2021	E.coli	<10 CFU/100 ml	<10 MPN/100 ml	Tests were conducted in MPN/100 ml instead of											
	15/09/2021			ND												
Alf Larson STP Effluent	08/09/2021	E.coli	<10 CFU/100 ml	ongli	shed on Pt	390 B-1	led of Pr	on ch	ND							
	01/09/2021															
	26/08/2021					ND	<ul> <li>- unreported/under-reported failure/defects of si equipment by contractors,</li> <li>- sampling &amp; reporting errors by operator</li> <li>- Improper change management (change of contractor)</li> </ul>									
	20/08/2021			ND	<ul> <li>2022. The site is wholly contractor operated and maintained - and at present, since discovering the non-compliances, is planned to be turned offline while major corrective actions are outworked.</li> <li>C-CPLRC-100288994 (case still open)</li> <li>Numerous effluent quality breaches for an extended period, due to a combination of the following factors;</li> <li>influent flows to site exceeding plant's treatment capacity,</li> <li>'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers),</li> </ul>											
	12/08/2021			ND												
	05/08/2021			ND	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and											
	26/07/2021			ND												
	21/07/2021			ND												
	21/07/2021			ND												

	14/10/2021			<10 MPN/100 ml	
	21/10/2021	-		<10 MPN/100 ml	Tests were conducted in MPN/100 ml instead of CFU/100ml
	28/10/2021			<10 MPN/100 ml	
	4/11/2021			<10 MPN/100 ml	
	11/11/2021			<10 MPN/100 ml	<u> </u>
	18/11/2021			ND	No Data Available
Alf Larson STP	25/11/2021	E. coli	10 CFU/100 ml	<10 CFU/100ml	LOR is equal to the EA maximum Limit
Effluent	2/12/2021			ND	No Data Available
	08/12/2021			<10 CFU/100ml	LOR is equal to the EA maximum Limit
	15/12/2021			ND	No Data Available
	22/12/2021	ished	8	<10 CFU/100 ml	LOR is equal to the EA maximum Limit
	29/12/2021			<10 CFU/100 ml	LOR is equal to the EA maximum Limit

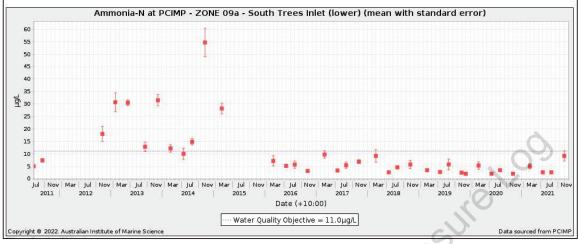
Port Curtis Integrated Monitoring Program (PCIMP) data for the South Trees Inlet (lower) monitoring zone (zone 9a).

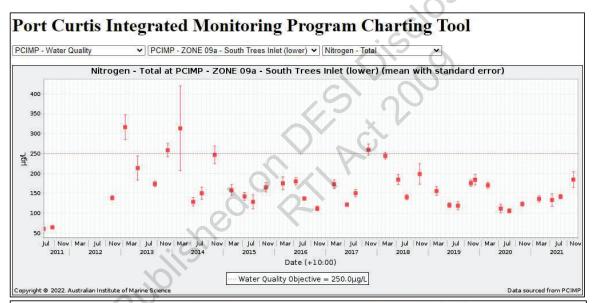
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# Port Curtis Integrated Monitoring Program Charting Tool

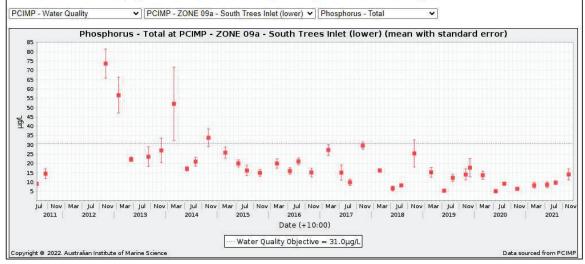
PCIMP - Water Quality V PCIMP - ZONE 09a - South Trees Inlet (lower) V Ammonia-N

The analytical laboratory used by PCIMP has identified a problem with low level ammonia analysis in seawater since May 2013. Therefore all ammonia data from May 2013 to July 2015 is erroneous.





# Port Curtis Integrated Monitoring Program Charting Tool



# Part 2 – Already contained and uploaded to WaTERS

## Part 3 – Monitoring data commentary

- 1. The Operational monitoring of Alf Larson's Park confirmed the challenges with the current existing infrastructure. GRC is currently investigating the solutions to maintain the Alf Larson's Park effluent well below the compliance limits.
- 2. Due to the frequent wet weather conditions, effluent flow exceedances were observed frequently.

## Part 4 – Mitigation measures

- 1. Rotork Valve replacement due to repair identified as part of Maintenance in May 2021- South Trees WWTP
- 2. Gladstone WWTP Service Water Upgrade project to commence in early 2023.
- 3. Envirosys environmental monitoring system currently being implemented to capture the out of compliance or near breach results and send notifications to relevant business units for action.
- 4. Verification/Calibration of Flow meters Project in the initial stages for tenders to be invited in the New Year 2023.
- 5. Gladstone Regional Council are currently undertaking stormwater intrusion/illegal stormwater-sewage connection investigations for the Gladstone catchment, including 'smoke testing' of problem areas of the network. This is a 5-year program. To identify defects in the network (including points that may act as entry points for extraneous water), Council undertakes an annual CCTV inspection program, the results of which inform sewer and stormwater repair and relining works. From July 2021 to the 3rd March 2022, Council have relined over 25.75km\* of sewer and stormwater\*\* mains, equating to \$5,096,344\* (Ex. GST) capital works expenditure. Wet Weather Incident Final Notification Report Gladstone Regional Council Environment and Conservation TE-ENV01 General stormwater ingress incident 10 day report template Approved ME&C 18.03.2022 Page 4 \*Relining works for the 2021-2022FY are still underway; this value is inclusive of pipes scheduled for this financial year, and is subject to variation (e.g. some locations may be more appropriate to patch rather than reline, costs may vary should the project scope require variation– night works, traffic management, increase of relining distance, etc.). \*\*relining projects often address both sewer and stormwater assets concurrently, hence the combined statistic. It is noted that sewer forms most of the mains targeted.
- 6. Actions to address Gladstone WWTP wet weather resilience: Council is currently in the design phase for the Gladstone WWTP Influent Distribution Chamber Upgrade, the outcome of which will improve the plant's ability to balance and distribute influent, and better monitor inflows.

Site Based Management Plans (SBMP) have been developed for each STP. These plans incorporate an Environmental Risk Register that provides mitigation measures to reduce a wide range of environmental risks that could be encountered at each site.

Operators also perform a weekly site inspection Checklist at each plant to identify environmental issues or performance concerns. In addition, new employees attend GRC Orientation that contains a designated Environmental Management section that incorporates but is not limited to the following; General Environmental Duty, duty to notify, and how to recognise, prevent and/or manage Environmental incidents.

# Part 5 – Recycled water data GLADSTONE WWTP:

Gladstone	WWTP Recycled Water
Month	Volume (ML)
Jan-21	237.662
Feb-21	180.357
Mar-21	274.755
Apr-21	236.142
May-21	175.29
Jun-21	202.20
Jul-21	230.55
Aug-21	235.677
Sep-21	236.075
Oct-21	176.00
Nov-21	258.33
Dec-21	246.19
	DFS1200s
Gladstone	WWTP River Discharge

Gladstone WWTP River Discharge				
Month	Volume (ML)			
Jan-21	0			
Feb-21	0			
Mar-21	34.16			
Apr-21	21.48			
May-21	0			
Jun-21	20.74			
Jul-21	180.8			
Aug-21	0			
Sep-21	31.91			
Oct-21	0			
Nov-21	77.336			
Dec-21	113.993			

#### Gladstone WWTP Flow Exceeding 10 ML/Day

Month	Exceedance (ML)	Comments
9-Jul	29.14	Following Internal reviews, all the
10-Jul	14.29	exceedances were
22-Jul	21.37	reported to DES (04/07/2021)
23-Jul	35.05	N-100108621
24-Jul	11.47	6
8-Sep	10.26	

#### Tannum WWTP:

Month	Tannum WWTP Recycled Water (ML)
Jan-21	27.169
Feb-21	28.502
Mar-21	40.319
Apr-21	28.111
May-21	27.584
Jun-21	32.777
Jul-21	38.772
Aug-21	29.439
Sep-21	31.654
Oct-21	25.249
Nov-21	37.011
Dec-21	50.046

## AGNES WWTP:

Month	Agnes Water WWTP Volume Treated (ML)
Jan-21	21.212
Feb-21	10.573
Mar-21	6.474
Apr-21	17.966
May-21	22.24
Jun-21	12.352
Jul-21	18.301
Aug-21	16.97
Sep-21	15.183
Oct-21	9.375
Nov-21	9.923
Dec-21	17.857

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#### South Trees WWTP:

Month	South Trees W	NTP Discharge Volu	me (ML)						
Jan-21		20.31							
Feb-21		17.943							
Mar-21	24.728								
Apr-21	19.004								
May-21	17.731								
Jun-21	21.01								
Jul-21	20.575								
Aug-21	19.746								
Sep-21		16.522							
Oct-21		18.491							
Nov-21		30.91	. 09						
Dec-21		20.768							
Month	South Trees WWTP Excess Volume Discharged >1200KL/Day) KL	Date	Comments						
Jan-21	1609	(01/01)	Following Internal						
	1383	(26/01)	reviews, all the						
Feb-21	1392	(07/02)	exceedances were reported to DES						
Mar-21	1593	(16/03)	(04/07/2021)						
	1743	(21/03)	C-CPLRC-100108622						
	2026	(23/03)							
	1622	(24/03)							
Apr-21	1446	(02/04)							
	1747	(05/04)							
	1327	(09/04)							
May-21	1469	(13/05)	While Performing the Maintenance on Rotork Valve, Lowering of Weir Wall led to the exceedance of Daily Limit. Notified to DES on 13/05/2021						
Month	South Trees WWTP Excess Volume Discharged >1200KL/Day) KL	Date	Comments						
May	1367	(26/05)	Following Internal						
Jun-21	1356	(06/06)	reviews, all the						
	1382	(27/06)	exceedances were						
Jul-21	1858	(04/07)	reported to DES (04/07/2021)						
	1258	(22/07)	C-CPLRC-100108622						
Aug-21	1519	(31/08)							
	1010								

	1268	(11/11)	Exceedance of maximum
Nov-21			release limit Notified to
			DES (12/11/21)
	2949	(12/11)	Exceedance of maximum
			release limit-Notified to
			DES (13/11/21)
	1851	(22/11)	Exceedance of maximum
			release limit (23/11/21)
	4268	(25/11)	Exceedance of maximum
			release limit-Notified to
			DES (26/11/21)
	3100	(26/11)	Exceedance of maximum
			release limit-Notified to
			DES (27/11/21)
	1202	(28/11)	Exceedance of maximum
			Daily limit- Notified to
			DES (29/11/21)
Dec-21	1312	(05/12)	Exceedance of maximum
		S	Daily limit- Notified to
			DES (06/12/21)- reported
			as 1391KL- Actual was
			1312KL
LF LARSON's PARK :	Jui -	2003	
Month	Δlf La	rsons Park Treated Vol	ume (KL)
INIO IIIII			

#### ALF LARSON'S PARK :

Month	Alf Larsons Park Treated Volume (KL)
Jan-21	15.47
Feb-21	15.75
Mar-21	14.98
Apr-21	15.61
May-21	15.68
Jun-21	15.61
Jul-21	ND
Aug-21	ND
Sep-21	16.54
Oct-21	49
Nov-21	48
Dec-21	43

## **Annual Monitoring Report**

Title	Annual Monitoring Report 2021		
Environmental Authority	EPPR00959913	Locations	South Trees WWTP, Agnes Water WWTP, Gladstone WWTP, Tannum Sands WWTP, and Alf Larson WWTP
Monitoring Period	1 <sup>st</sup> January 2022 – 30 <sup>th</sup> June 2022	Prepared By	Niru Vemuri

#### Purpose:

The purpose of this report is to fulfill the requirements outlined in condition G5-ST, G21-AW, G6-GL, G8-TS and G8-ALF of the Environmental Authority EPPR00959913;

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PUDIS	ned official and a second seco				

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Part 1 – Nutrient mass load calculations & discharge volume data – see below pages

Published of RTI Act 2009

Location	Date of Non Compliance Observed	Parameter	Limit	Result	Comments
STD3	12/05/2021	Dissolved oxygen	Minimum 2mg/L	0.9	C-CPLRC-100094040 During maintenance on the Rotork valve controller, the South Trees weir fell, emptying a volume of the oxidation ditch to the discharge infrastructure (and the environment). A sample was quickly collected by an operator who was on site at the time of the incident - this sample had a decreased dissolved oxygen, as the aerators would have been turned off during the maintenance (and otherwise no decanting/discharging to the environment was planned while the maintenance was occurring).
RP1 Agnes Water WWTP	7/04/2021	E. coli	1000 MPN/100mL	23000 (licence median value for 5 samples was 4,700)	C-CPLRC-100089517 "The E.coli reading of 23,000 triggering the initial incident notification has been attributed to a potential sampling and/or lab analysis error – as lagoon re- sampling undertaken on the 16th of April returned an E.coli reading of <1MPN/100ml. Council acknowledge delays caused by the 7-9 day turn-around time (TAT) for E.coli analysis (i.e. transport to external NATA laboratory, plus incubation times etc.). Expediting of the analysis with the laboratory would still reap a 5-day delay between sampling date and return of results."
	14/10/2021			48 48 mg/L	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the non-
	8/12/2021		e de	7.6 mg/L	compliances, is planned to be turned offline while major corrective actions are outworked.
Alf Larson STP Effluent	15/12/2021	Total Phosphorus	7 mg/L	34 mg/L	C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended period, due to a combination of the following factors; - influent flows to site exceeding plant's treatment capacity, - 'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers), - unreported/under-reported failure/defects of site equipment by contractors, - sampling & reporting errors by operator - Improper change management (change of contractor)
	22/12/2021			28 mg/L	

Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments	
	20/08/2021	21 51.5 mg/L 74.4 mg/L		51.5 mg/L		
	1/09/2021					
	15/09/2021				. 00	
	7/10/2021			160 mg/L	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the non-	
	14/10/2021			510 mg/L	compliances, is planned to be turned offline while major corrective actions are outworked. C-CPLRC-100288994 (case still open)	
Alf Larson STP Effluent	21/10/2021	Total Nitrogen 30 mg/L	30 mg/L	30 mg/L	85 mg/L	Numerous effluent quality breaches for an extended period, due to a combination of the following factors; - influent flows to site exceeding plant's treatment capacity, - 'shock loading' from dumping of prohibited chemicals
	28/10/2021				36 mg/L	<ul> <li>into the adjacent caravan dump point (by customers),</li> <li>- unreported/under-reported failure/defects of site equipment by contractors,</li> <li>- sampling &amp; reporting errors by operator</li> <li>- Improper change management (change of contractor)</li> </ul>
	4/11/2021		410 mg/L			
	11/11/2021			44 mg/L		
	25/11/2021			38 mg/L		
	2/12/2021			38 mg/L		

Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments
	8/12/2021			42 mg/L	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the non- compliances, is planned to be turned offline while major corrective actions are outworked.
	15/12/2021	Total	30 mg/L	54 mg/L	C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended
Alf	22/12/2021	Nitrogen	50 mg/L	47 mg/L	<ul> <li>period, due to a combination of the following factors;</li> <li>influent flows to site exceeding plant's treatment capacity,</li> <li>'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers),</li> <li>unreported/under-reported failure/defects of site equipment by contractors,</li> <li>sampling &amp; reporting errors by operator</li> <li>Improper change management (change of contractor)</li> </ul>
Larson STP	29/09/2021			2500	Exceedances were not discovered by GRC until July
Effluent	7/10/2021			μs/cm 3000 μs/cm	2022. The site is wholly contractor operated and maintained - and at present, since discovering the non- compliances, is planned to be turned offline while
	14/10/2021	Electrical Conductivity	2500µs/cm	3800 µs/cm	C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended period, due to a combination of the following factors; - influent flows to site exceeding plant's treatment capacity, - 'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers), - unreported/under-reported failure/defects of site equipment by contractors, - sampling & reporting errors by operator - Improper change management (change of contractor) Exceedances were not discovered by GRC until July
	29/09/2021	200	8	8.1	2022. The site is wholly contractor operated and maintained - and at present, since discovering the non-compliances, is planned to be turned offline while
	7/10/2021	S		8.4	major corrective actions are outworked.
Alf	14/10/2021	)`		8.4	C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended period, due to a combination of the following factors; - influent flows to site exceeding plant's treatment capacity,
Larson STP Effluent	15/12/2021	рН	6.5-8.0	6	<ul> <li>'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers),</li> <li>unreported/under-reported failure/defects of site equipment by contractors,</li> <li>sampling &amp; reporting errors by operator</li> <li>Improper change management (change of contractor)</li> </ul>

Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments																				
	21/07/2021			ND																					
	26/07/2021			ND																					
	05/08/2021			ND																					
Alf	12/08/2021			ND	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the non- compliances, is planned to be turned offline while major corrective actions are outworked. C-CPLRC-100288994 (case still open)																				
Larson STP 20, Effluent	20/08/2021	E.coli	<10 CFU/100 ml	ND	Numerous effluent quality breaches for an extended period, due to a combination of the following factors; - influent flows to site exceeding plant's treatment capacity,																				
	26/08/2021		,0	ND	<ul> <li>'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers), unreported/under-reported failure/defects of site equipment by contractors,</li> <li>- sampling &amp; reporting errors by operator</li> </ul>																				
	01/09/2021		OL OF				OL OK																	ND	- Improper change management (change of contractor)
	08/09/2021	ched	Ŕ.	ND																					
	15/09/2021			ND																					
	29/09/2021	E.coli	<10 CFU/100 ml	<10 MPN/100 ml																					
Alf Larson STP Effluent	07/10/2021	E.coli	<10 CFU/100 ml	<10 MPN/100 ml	Tests were conducted in MPN/100 ml instead of CFU/100ml																				

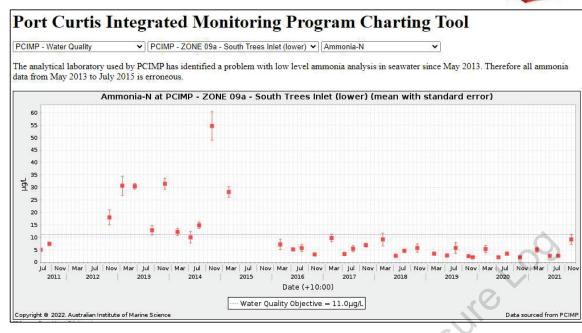
Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments
	14/10/2021			<10 MPN/100 ml	
	21/10/2021			<10 MPN/100 ml	
	28/10/2021			<10 MPN/100 ml	Tests were conducted in MPN/100 ml instead of CFU/100ml
	4/11/2021			<10 MPN/100 ml	
	11/11/2021			<10 MPN/100 ml	
	18/11/2021			ND	No Data Available
	25/11/2021	E. coli	10 CFU/100 mł	<10 CFU/100ml	LOR is equal to the EA maximum Limit
	2/12/2021			ND	No Data Available
Alf Larson STP Effluent	08/12/2021			<10 CFU/100ml	LOR is equal to the EA maximum Limit
Lindent	15/12/2021			ND	No Data Available
	22/12/2021			<10 CFU/100 ml	LOR is equal to the EA maximum Limit
	<i>S</i> <sub><i>j</i><sub>c</sub></sub>				LOR is equal to the EA maximum Limit
	29/12/2021			<10 CFU/100 ml	

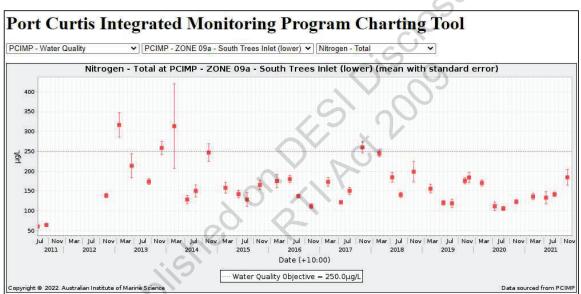
Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments
Alf	19/01/22			11	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and
Larson STP Effluent	27/01/22	Total Phosphorous	7 mg/L	12	maintained - and at present, since discovering the non compliances, is planned to be turned offline while major corrective actions are outworked.
	2/02/22			22	C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended
	11/02/22			14	period, due to a combination of the following factors; - influent flows to site exceeding plant's treatment
	16/02/22			18	capacity, - 'shock loading' from dumping of prohibited chemicals
	25/02/22			15	into the adjacent caravan dump point (by customers), - unreported/under-reported failure/defects of site
	3/03/22			7.4	equipment by contractors, - sampling & reporting errors by operator
	10/03/22			ND	- Improper change management (change of contractor)
	16/03/22			13	. C
	28/03/22			ND	cull
	10/3/22			ND	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and
	28/03/22			ND	maintained - and at present, since discovering the non- compliances, is planned to be turned offline while
	5/04/22			ND	major corrective actions are outworked. C-CPLRC-100288994 (case still open)
Alf Larson	14/04/22	Electrical	,0	ND	Numerous effluent quality breaches for an extended period, due to a combination of the following factors;
STP Effluent	21/04/22	Conductivity	2500µs/cm	3400	<ul> <li>- influent flows to site exceeding plant's treatment capacity,</li> <li>- 'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers),</li> <li>- unreported/under-reported failure/defects of site equipment by contractors,</li> <li>- sampling &amp; reporting errors by operator</li> <li>- Improper change management (change of contractor)</li> </ul>
	25/02/22	S		8.3	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and
	10/03/22	рН	6.5-8.0	ND	maintained - and at present, since discovering the non- compliances, is planned to be turned offline while major corrective actions are outworked.
Alf	28/03/22			ND	C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an extended period, due to a combination of the following factors;
Larson STP Effluent	5/04/22			ND	<ul> <li>influent flows to site exceeding plant's treatment capacity,</li> </ul>
	14/04/22			ND	<ul> <li>- 'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point (by customers),</li> <li>- unreported/under-reported failure/defects of site</li> </ul>
	31/05/22			6.4	- unreported under-reported failure/defects of site equipment by contractors, - sampling & reporting errors by operator - Improper change management (change of contractor)
	14/06/22			8.2	
Alf	7/01/22	Total		47	
Larson STP Effluent	12/01/22	Nitrogen	30 mg/L	50	

Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments
	19/01/22	-		55	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since
	27/01/22			36	discovering the non-compliances, is planned to be turned offline while major corrective actions are outworked.
	2/2/22			46	C-CPLRC-100288994 (case still open) Numerous effluent quality breaches for an
	11/2/22			50.1	extended period, due to a combination of the following factors; - influent flows to site exceeding plant's
	16/2/22			39	treatment capacity, - 'shock loading' from dumping of prohibited chemicals into the adjacent caravan dump point
	25/02/22	Total Nitrogen	30 mg/L	31	(by customers), - unreported/under-reported failure/defects of site equipment by contractors,
	10/3/22	isned		ND	- sampling & reporting errors by operator Improper change management (change of contractor)
	28/03/22			NDS	29
Alf Larson STP	25/4/22			41	2
Effluent	3/5/22			41	
	9/5/22			36	
	20/5/22			51	
	24/5/22			58	
	31/05/22			87	
	14/06/22			81	
	21/06/22			69	
	28/06/22			48	

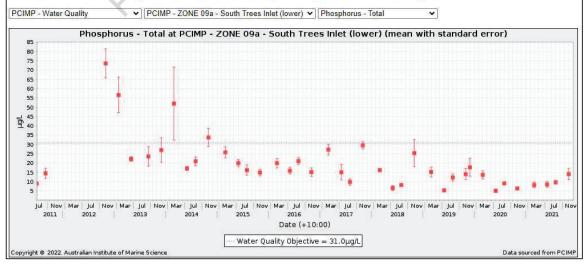
Location	Date of Non- Compliance Observed	Parameter	Limit	Result	Comments
	7/01/22 to 28/06/22			<10	LOR is equal to the EA maximum Limit
	12/01/22		-	<100	LOR > EA Max limit
Alf	10/03/22			ND	No Data
Larson STP	28/3/22	E.coli	10 CFU/100 ml	ND	No Data
Effluent	21/04/22			>2000	Sample Bottles not labelled. Invalid sample
	25/04/22			<100	In valid sample
	3/5/22	-		<100	In valid sample
	10/03/22- 14/03/22	Suspended	80% 30 mg/L	38 mg/L	CPLRC-100205710 for the 3rd Feb 2022 (pH exceedance, 9.02, due to a moderate algal
Gld WWTP Effluent	15/03/22- 09/04/22	Solids		207 mg/L	bloom). Test results for the following day yielded results of 7.46.
Discharge to River	03.02.22	рН	6.5-8.5	9.02	The wet weather event in March (C-CPLRC- 100221566) caused the pH exceedance (reading
	13/03/22		0	6.28	of 6.28, under the minimum limit of 6.5) on the 13th – note that the daily sampling GRC
	12/05/22 to 23/05/22	-	80% 30 mg/L	207 mg/L	<ul> <li>undertake when discharging to the river is not compliance monitoring, it is due-diligence monitoring. Compliance monitoring (weekly)</li> </ul>
	24/05/22				37 mg/L
	25/05/22	6		34 mg/L	GRC did not breach the 80th %ile limit for suspended solids, based on a year-to-date
Gld WWTP	26/05/22	Suspended		37 mg/L calculated o	calculation (noting that 80th %ile cannot be calculated on samples taken at irregular
Effluent Discharge to River	27/05/22	Solids		38 mg/L	<ul> <li>frequency – such as event samples – as this would render the calculation statistically invalid).</li> </ul>
	28/5/22			35 mg/L	
	29/5/22			38 mg/L	
	30/05/22			38 mg/L	

Port Curtis Integrated Monitoring Program (PCIMP) data for the South Trees Inlet (lower) monitoring zone (zone 9a).





## Port Curtis Integrated Monitoring Program Charting Tool



#### Part 2 – Already contained and uploaded to WaTERS

#### Part 3 – Monitoring data commentary

- The Operational monitoring of Alf Larson's Park confirmed the challenges with the current existing infrastructure. GRC is currently investigating the solutions to maintain the Alf Larson's Park effluent well below the compliance limits.
- 2. Due to the frequent wet weather conditions, effluent flow exceedances were observed frequently.

#### Part 4 – Mitigation measures

- 1. Rotork Valve replacement due to repair identified as part of Maintenance in May 2021- South Trees WWTP
- 2. Gladstone WWTP Service Water Upgrade project to commence in early 2023.
- 3. Envirosys environmental monitoring system currently being implemented to capture the out of compliance or near breach results and send notifications to relevant business units for action.
- 4. Verification/Calibration of Flow meters Project in the initial stages for tenders to be invited in the New Year 2023.
- 5. Gladstone Regional Council are currently undertaking stormwater intrusion/illegal stormwater-sewage connection investigations for the Gladstone catchment, including 'smoke testing' of problem areas of the network. This is a 5-year program. To identify defects in the network (including points that may act as entry points for extraneous water), Council undertakes an annual CCTV inspection program, the results of which inform sewer and stormwater repair and relining works.
- 6. From July 2021 to the 3rd March 2022, Council have relined over 25.75km\* of sewer and stormwater\*\* mains, equating to \$5,096,344\* (Ex. GST) capital works expenditure. This is an ongoing capital budget (pending Council approval and identified defects) each financial year.
- 7. Relining works for the 2021-2022FY are still underway; this value is inclusive of pipes scheduled for this financial year, and is subject to variation (e.g. some locations may be more appropriate to patch rather than reline, costs may vary should the project scope require variation— night works, traffic management, increase of relining distance, etc.). \*\*relining projects often address both sewer and stormwater assets concurrently, hence the combined statistic. It is noted that sewer forms most of the mains targeted.
- 8. Actions to address Gladstone WWTP wet weather resilience: Council is currently in the design phase for the Gladstone WWTP Influent Distribution Chamber Upgrade, the outcome of which will improve the plant's ability to balance and distribute influent, and better monitor inflows.
- 9. Council release to third parties, treated effluent, thus reducing the release to waters at Gladstone, Boyne Island, Tannum Sands and Calliope WWTPs.
- 10. Capital projects also included pump station and manhole works both renewal/upgrades throughout this period.
- 11. Gladstone and South Trees WWTP root cause analysis investigation and report for volume exceedances during wet weather.

Site Based Management Plans (SBMP) have been developed for each STP. These plans incorporate an Environmental Risk Register that provides mitigation measures to reduce a wide range of environmental risks that could be encountered at each site.

Operators also perform a weekly site inspection Checklist at each plant to identify environmental issues or performance concerns. In addition, new employees attend GRC Orientation that contains a designated Environmental Management section that incorporates but is not limited to the following; General Environmental Duty, duty to notify, and how to recognise, prevent and/or manage Environmental incidents.

#### Part 5 – Recycled water data GLADSTONE WWTP:

	WWTP River Discharge
Month	Volume (ML)
Jan-21	0
Feb-21	0
Mar-21	34.16
Apr-21	21.48
May-21	0
Jun-21	20.74
Jul-21	180.8
Aug-21	0
Sep-21	31.91
Oct-21	0
Nov-21	77.336
Dec-21	113.993
Jan-22	11.52
Feb-22	8.79
Mar-22	186.57
Apr-22	11.51
May-22	128.72
June-22	82.43
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22-265

Month	Volume (ML)
Jan-21	237.662
Feb-21	180.357
Mar-21	274.755
Apr-21	236.142
May-21	175.29
Jun-21	202.20
Jul-21	230.55
Aug-21	235.677
Sep-21	236.075
Oct-21	176.00
Nov-21	258.33
Dec-21	246.19
Jan-22	218.153
Feb-22	206.836
March-22	186.256
Apri-22	215.549
May-22	80.714
June-22	190.968

	tone WWTP Flow Exceeding 10 ML	, ,
Month	Exceedance (ML)	Comments
9-Jul 21	29.14	Following Interr reviews, all the exceedances we reported to DE (04/07/2021)
10-Jul 21	14.29	N-100108621
22-Jul 21	21.37	SUICE
23-Jul 21	35.05	<u>20</u>
24-Jul 21	11.47	
8-Sep 21	10.26	
11/03/22	29.20	- Report : C-CPL 100221566
12/03/22	37.23	100221300
13/03/22	26.34	
14/03/22	20.72	
15/03/22	12.48	
16/03/22	12.70	
17/03/22	10.77	
13/05/22	10.55	C-CPLRC-100256
25/05/22	13.16	C-CPLRC-100261

#### Tannum WWTP:

Month	Agnes Water WWTP Volume Treated (ML)
AGNES WWTP:	OFACT
June-22	32.701
May-22	50.350
April-22	25.287
March-22	43.405
Feb-22	21.854
Jan-22	27.353
Dec-21	50.046
Nov-21	37.011
Oct-21	25.249
Sep-21	31.654
Aug-21	29.439
Jul-21	38.772
Jun-21	32.777
May-21	27.584
Apr-21	28.111
Mar-21	40.319
Feb-21	28.502
Jan-21	27.169
Month	Tannum WWTP Recycled Water (ML)

#### AGNES WWTP:

Month	Agnes Water WWTP Volume Treated (ML)
Jan-21	21.212
Feb-21	10.573
Mar-21	6.474
Apr-21	17.966
May-21	22.24
Jun-21	12.352
Jul-21	18.301
Aug-21	16.97
Sep-21	15.183
Oct-21	9.375
Nov-21	9.923
Dec-21	17.857
Jan-22	15.857
Feb-22	14.358
Mar-22	16.694
Apr-22	19.444
May-22	18.901
June-22	21.109

#### South Trees WWTP:

Month	South Trees WWTP Discharge Volume (ML)
Jan-21	20.31
Feb-21	17.943
Mar-21	24.728
Apr-21	19.004
May-21	17.731
Jun-21	21.01
Jul-21	20.575
Aug-21	19.746
Sep-21	16.522
Oct-21	18.491
Nov-21	30.91
Dec-21	20.768
Jan-22	18.341
Feb-22	17.024
Mar-22	22.867
Apr-22	Flow meter unavailable from 31.03.2022 to 10.08.2022
May-22	
June-22	
uth Trees Flow Exceeda	nces Jan-21 to June 22

## South Trees Flow Exceedances Jan-21 to June 22

			1
Month	South Trees WWTP Excess Volume Discharged >1200KL/Day) KL	Date	Comments
Jan-21	1609	(01/01)	Following Internal
	1383	(26/01)	reviews, all the
Feb-21	1392	(07/02)	exceedances were reported to DES
Mar-21	1593	(16/03)	(04/07/2021) C-CPLRC-100108622
	1743	(21/03)	C-CPLKC-100108622
	2026	(23/03)	
	1622	(24/03)	
Apr-21	1446	(02/04)	
	1747	(05/04)	
	1327	(09/04)	
May-21	1469	(13/05)	While Performing the Maintenance on Rotork Valve, Lowering of Weir Wall led to the exceedance of Daily Limit. Notified to DES on 13/05/2021

May	1367	(26/05)	Following Internal
Jun-21	1356	(06/06)	reviews, all the
	1382	(27/06)	exceedances were reported to DES
Jul-21	1858	(04/07)	(04/07/2021)
	1258	(22/07)	C-CPLRC-100108622
Aug-21	1519	(31/08)	
Nov-21	1268	(11/11)	Exceedance of maximum release limit Notified to DES (12/11/21)
	2949	(12/11)	Exceedance of maximum release limit-Notified to DES (13/11/21)
	1851	(22/11)	Exceedance of maximum release limit (23/11/21)
	4268	(25/11)	Exceedance of maximum release limit-Notified to DES (26/11/21)
	3100	(26/11)	Exceedance of maximum release limit-Notified to DES (27/11/21)
	1202	(28/11)	Exceedance of maximum Daily limit- Notified to DES (29/11/21)
Month	South Trees WWTP Excess Volume Discharged >1200KL/Day) KL	Date	Comments
Dec-21	1312	(05/12)	Exceedance of maximum Daily limit- Notified to DES (06/12/21)- reported as 1391KL- Actual was 1312KL
March-22	3039	09/03/2022	
	2712	10/03/2022	C-CPLRC-100221566
	1518	11/03/2022	

#### ALF LARSON'S PARK :

Month	Alf Larsons Park Treated Volume (KL)
Jan-21	15.47
Feb-21	15.75
Mar-21	14.98
Apr-21	15.61
May-21	15.68
Jun-21	15.61
Jul-21	ND
Aug-21	ND
Sep-21	16.54
Oct-21	49
Nov-21	48
Dec-21	43
Jan-22	56
Feb-22	48
Mar-22	43
Apr-22	72
May-22	57
June-22	66

Published of RTIP

Date : 20/04/2020 11:19:48 AM From : "Workspace" To : "Pollution Hotline" Cc : "Clint.Swanton@gladstone.qld.gov.au" , "Anna.Scott@gladstone.qld.gov.au" , "Jane.Doran@gladstone.qld.gov.au" , "Neels.Kloppers@gladstone.qld.gov.au" , "EnvSus@gladstone.qld.gov.au" , "Niru.Vemuri@gladstone.qld.gov.au" , "Ethics andIntegrity@gladstone.qld.gov.au" , "CW ES\_Gladstone" Subject : Gladstone Regional Council Non-Compliance Initial Notification Environmental Authority EPPR00959913 - EHP Pollution Hotline - CRTBA - Agnes Water/1770 - 17/04/2020 11:00:00 AM

Dear EHP Officer

Gladstone Regional Council would like to notify the following non-compliance details.

WWTP NC ID: WWTP NC 102

EHP CR number: TBA

Date of Non-compliance: 17/04/2020 11:00:00 AM

Waste water treatment plant: Agnes Water/1770

Licence condition involved: WT6-AW,G1-AW

Licence specification:

The maximum release of recycled water to land over any 24 hour period through the approved irrigation area, to be 900kL

Non-compliance or breech: Treated Effluent kL

Non-compliance data: 1152 kL of Treated Effluent was irrigated on 17/04/2020.

Licence specification: The maximum release of recycled water to land over any 24 hour period through the approved irrigation area, to be 900kL

Please notify the below Council Officer with any enquires regarding this notification.

Jane Doran PO Box 29 Gladstone Qld 4680 Phone: 07 4970 0700 Jane.Doran@gladstone.qld.gov.au

#### Date : 20/08/2020 7:59:27 AM From : "Pollution Hotline" To : "CW ES\_Gladstone" Subject : FW: C-CPLRC-100021308 N-100021307 Non Conformance Report Attachment : image001.gif;image002.png;image004.png;

#### Good Morning Gladstone Compliance Team

Community Response Team has received the below notification from Gladstone Regional Council (EPPR00959913) regarding exceedance of irrigation limit for your action.

Notification Reference: N-100021307 Case Reference: C-CPLRC-100021308 Complexity ( priority) Assessment: Medium



#### Shari Sievers Community Response Officer Community Response | Operational Support Department of Environment and Science

P 1300 130 372 (option 2) E <u>pollutionhotline@des.qld.gov.au</u> Lvl 9 400 George Street, BRISBANE QLD 4000 GPO Box 2454, BRISBANE QLD 4001

From: Chris.Irving 
Sent: Friday, 14 August 2020 5:10 PM
To: Pollution Hotline
Cc: T1ecmp; Jane Doran
Subject: C-CPLRC-100021308 N-100021307 Non Conformance Report

Hi,

I need to report a non conformance against Condition G1-AW of EPPR00959913 for Gladstone Regional Council. We received a report at 16:55 from our contract operator of the Agnes Water STP that during the 24hrs over 13 August 2020 that we irrigated 911kL of treated effluent to the irrigation area, above the 900kL in our licence.

OSUIR

I contacted the Pollution Hotline phone number but unfortunately received the after hours service where a message is taken – it was more effective to contain this detail in an email, as it does not constitute an emergency event.

Investigation in to the irrigation above licence limits will occur and information provided in the 10-day report.

Please contact me on 0427 298 576 where required.

Regards,

Chris Irving Manager Environment & Conservation Strategic Asset Performance

GLADSTONE REGIONAL COUNCIL

PO Box 29 Gladstone Qld 4680 Phone 07 4970 0700 Email: <u>Chris.lrving@gladstone.qld.gov.au</u> | Website: <u>www.gladstone.qld.gov.au</u> Date : 20/08/2020 11:11:03 AM From : "Pollution Hotline" To : "CW ES\_Gladstone" Subject : FW: Gladstone Regional Council Non-Compliance Initial Notification Environmental Authority EPPR00959913 - EHP Pollution Hotline - CRTBA - Agnes Water/1770 - 20/08/2020 12:00:00 AM\_C-CPLRC-100021351 Attachment : image001.png;

Hi Gladstone compliance team,

C-CPLRC-100021351

Complexity Medium

Thanks,

Justin



## Justin Fritz

Senior Environmental Officer Community Response Team | Operational Support Environmental Services and Regulation Department of Environment and Science P 1300 130 372 option 2 E pollutionhotline@des.gld.gov.au Level 9, 400 George St, Brisbane QLD 4000 GPO Box 2454, Brisbane QLD 4001

From: Workspace <webmaster@gladstone.qld.gov.au> Sent: Thursday, 20 August 2020 10:42 AM To: Pollution Hotline C: Clint Swaston@gladstone.gld.gov.au: Anna Scott@g

Cc: Clint.Swanton@gladstone.qld.gov.au; Anna.Scott@gladstone.qld.gov.au; Jane.Doran@gladstone.qld.gov.au;

Neels.Kloppers@gladstone.qld.gov.au; EnvSus@gladstone.qld.gov.au; Niru.Vemuri@gladstone.qld.gov.au; EtbiosondIntegrity@gladstone.qld.gov.au; CM/ES\_Cladstone.

EthicsandIntegrity@gladstone.qld.gov.au; CW ES\_Gladstone

Subject: Gladstone Regional Council Non-Compliance Initial Notification Environmental Authority EPPR00959913 - EHP Pollution Hotline - CRTBA - Agnes Water/1770 - 20/08/2020 12:00:00 AM

surelo

Dear EHP Officer

Gladstone Regional Council would like to notify the following non-compliance details.

WWTP NC ID: WWTP NC 110

EHP CR number: TBA

Date of Non-compliance: 20/08/2020 12:00:00 AM

Waste water treatment plant: Agnes Water/1770

Licence condition involved: G1-AW

Licence specification:

The maximum release of recycled water to land over any 24 hour period through the approved irrigation area, to be 900kL.

Non-compliance or breech: Treated Effluent kL

Non-compliance data: 1017 kL of Treated Effluent was irrigated during the 24 hour period of the 19/08/2020. Notification Number for this incident - N-1000-21342. CC-CPLRC Number to be provided from Pollution Hotline via email.

Licence specification: The maximum release of recycled water to land over any 24 hour period through the approved irrigation area, to be 900kL.

Please notify the below Council Officer with any enquires regarding this notification.

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Date : 28/08/2020 5:00:36 PM From : "Ethics and Integrity (Mailbox)" To : "CW ES\_Gladstone" , "Pollution Hotline" Subject : FW: C-CPLRC-100021308 & C-CPLRC-100021351 Final Report Attachment : C-CPLRC-100021308 & C-CPLRC-100021351- Agnes Water WWTP - 13 & 19.08.2020 - Final Report.pdf;image001.jpg; Good afternoon,

Please find attached Final Notice Report for Licence Condition G1-AW (EA 🚸 EPPR00959913) for both 13 Aug 2020 and 20 Aug 2020.

Kind Regards.



PO Box 29 Gladstone QLD 4680 Phone: 07 4970 0700 | Fax: 07 4970 0700 Website: www.gladstone.qld.gov.au

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## Non-Compliance Final Notification Report

The purpose of this document is report non-compliance of the requirements set out in the relevant Environmental Authority Permit for the activity. Notification of non-compliance is requested to fulfil an organization's obligations under Section 320 of the Environmental Protection Act 1994, which is an obligation to notify the chief executive of the DES of any incident that has and/or threatens to cause material or serious environmental harm. The Gladstone Regional Council is collecting your personal information in accordance with the Environmental Protection Act 1994 to process this Notification Form. The information will only be accessed by authorised council employees. Some of this information may be given to other Government Departments. Your information will not be given to any other person or agency unless you have given us permission, or we are required by law.

Notification Report Submitted By:						
Gladstone Regional Council						
Address	101 Goondoon Street					
City	Gladstone QLD 4680					
Telephone	4970 0700					
E-mail address	info@gladstone.qld.gov.au					
	Incident Reference Information					
Site:	Agnes Water WWTP, Yabby Road, AGNES WATER - Lot 21 SP168519					
DES Customer Reference number/s:	C-CPLRC-100021308 & C-CPLRC-100021351					
GRC reference number:	WWTPEI110					
Date/s of Non-Compliance:	13/08/2020 & 19/08/2020					
	Non-Compliance Information					
Environmental Authority:	EPPR00959913					
Licence Condition:	G1-AW					
Description of Non- Compliance:	>900kL release of recycled water / 24 hour period. 911kL was released on the 13/08/2020 and 1017kL on the 19/08/2020.					
Reason for Non- Compliance:	Both over irrigation events were due to a programming fault/issue with the Galcon Irrigation Controller unit.					
Actions taken to rectify the Non-Compliance:	Currently Irrigation is only occurring during the day to ensure that the lagoons levels are maintained with the requisite freeboard and is manually isolated at the main value overnight. HR Products (Galcon Specialist) have been engaged to check the irrigation programming. They have identified that there is an evident problem with the irrigation controller unit and have escalated the issue to specialists at the Galcon headquarters in Israel.					
	Please see attached Over-Irrigation Action Plan for completed and ongoing actions.					
Detail extent of environmental harm caused if known:	None identified.					
Other relevant information:	<ul> <li>Please find following:</li> <li>Galcon – Daily Station's Consumption Report (13 August 2020 – 19 August 2020)</li> <li>Trility Over Irrigation Action Plan</li> </ul>					
Reporter						
Name: Jane Doran	Date: 28 August 2020					

Reviewed



8/28/2020 06:11:17 AM

**Daily Station's Consumption in m<sup>3</sup>** 

From Date Thursday, August 13, 2020 To Date

Wednesday, August 19, 2020

Eff	luen	nt Re use														
		Date	Station 1	Station 2	Station 3	Station 4	Station 5	Station 6	Station 7	Station 8	Station 9	Station 10	Station 11	Station 12	Unexpected Flow	Total
		<mark>(13</mark> )				(350:00)	202.00	(350.00)				) <i>-</i>			(9.00)	911.0
		14					78.00		280.00	280.00	280.00				21.00	939.0
		15									.0,	280.00	280.00	280.00	16.00	856.0
	≥	16	260.00	260.00	260.00										16.00	796.0
2020	ĝ	17					280.00				5				3.00	283.0
		18				210.00		210.00							6.00	426.0
		<mark>(19</mark> )							335.00	335.00	(335.00)				(12.00)	1,017.0
		Total	260.00	260.00	260.00	560.00	560.00	560.00	615.00	615.00	615.00	280.00	280.00	280.00	83.00	5,228.0
		Grand Total	260.00	260.00	260.00	560.00	560.00	560.00	615.00	615.00	615.00	280.00	280.00	280.00	83.00	5,228.0

-

Action	Responsibility	Due	Status
1. Investigate the root causes of all incidents	Team Leader	21/8/2020	Completed- Controller malfunction is causing extra shifts of irrigation to operate. Diaphragms in control valves need replacement.
<ol> <li>For today; Irrigate during the day and physically isolate the main isolation valve at the end of the shift. Please text Wade when this has been closed to confirm.</li> </ol>	Team Leader	20/8/2020	Completed. Current operation is being completed between 7am-4pm. This will irrigate a reduced rate which is not sustainable but is a short-term measure until a secondary solution is installed.
<ol> <li>Discuss/Implement short term options with the team to re-evaluate current irrigation program; Can a majority of flows occur between 7am and 4pm with a physical isolation conducted at the day end by process controllers?</li> </ol>	Team Leader	20/8/2020	Completed. Current operation is being completed between 7am-4pm. This will irrigate a reduced rate which is not sustainable but is a short-term measure until a secondary solution is installed.
<ol> <li>Reduce the irrigation volume values to allow for greater unknown flows or if extra shifts occur, then we remain under 900kL more conservative figures need to be selected.</li> </ol>	Team Leader	21/8/2020	Completed. This is possible, however with a malfunctioning controller, there is still a risk that without a positive isolation at the shift completion, then over- irrigation is still possible. If the main valve is closed, then this would need to be reopened at midnight. From a safety perspective this is not feasible. With this change would also be significantly reduced irrigation when the programs run correctly.
5. Irrigation volumes to be consistently checked at the estimated time of closure. (approx. 700-800kL total) during the day by remote access. If over-irrigation is imminent or the controller has failed the oncall process controller is to attend site and physically isolate the valve.		20/8/2020	Completed. Running between 7am-4pm there are not enough hours to over irrigate.
<ol> <li>Have a specialist check the program and functionality. If changes are made, then conduct a thorough testing. Report to Wade any program bug fixes.</li> </ol>	Team Leader	27/8/2020	Ongoing. Dave McConnell to follow-up with HR products on the issue. He is to also explore implementing a Totalised flow stop setpoint to shut-down all irrigation valves at an operator adjustable totalised flow. Cost and change times to be requested also. DMc to keep WM informed of the outcomes. Still awaiting a response from HR Products.

Action	Responsibility	Due	Status
<ol> <li>Perform daily manual valve isolations on plots which aren't operating.</li> </ol>	Team Leader	20/8/2020	Completed and Ongoing
<ol> <li>Write a brief Work Instruction in dot-point form of any new procedural changes that have occurred and your expectations. Communicate to all members of the team via a toolbox talk.</li> </ol>	Team Leader	21/8/2020	Completed
<ol><li>Follow up on the ordered valve diaphragms whereabouts</li></ol>	Team Leader	17/8/2020	Completed. By the end of the month.
10. Keep council informed of this action plan and improvements undertaken	Operations Manager	20/8/2020	Completed and Ongoing
11. Install secondary irrigation shutdown using a PLC to count hours and provide signal to the irrigation controller at 850kL to shutdown. Purchase simple PLC capable of real time, with local compatible software. Fast track the shipping and install as the highest priority.	Team Leader & Process Controller	28/8/2020	PLC has been programmed and will be installed into cabinet on 25/8/2020.
highest priority.	led of Al		

Page 139 of 200ge 2 of 2

#### Date : 9/12/2020 4:15:18 PM From : "Chris Irving" To : "DELA CRUZ Myra" Cc : "Ethics and Integrity (Mailbox)", "T1ecmp" Subject : RE: Agnes Water WWTP - Groundwater Monitoring Results Attachment : J169864\_Trility-GW\_Jun20\_Annual\_Report\_Rev0\_Optimized.pdf;J163599-03\_AgnesWaterGW\_Mar20\_QRTLY\_Report\_Rev1.pdf;image001.png;image003.png;image004.jpg;image002.png; Hi Myra,

Please find information below for the Agnes Water STP groundwater monitoring program and to provide the information requested.

The groundwater monitoring program has been established as per the 2016 GMP, including the 6 down gradient bores required. Following installation and during ongoing monitoring it has been identified that shallow bores are frequently dry and additional bores are required to be installed to support sampling events over the long term as per Greencap Annual Report recommendations. This recommendation is driving the new groundwater monitoring program review and installation of additional bores to rectify This information also provides further context to the information contained in correspondence with Rebecca Griffiths.

- Commencement details of the groundwater monitoring program. Groundwater monitoring aligned with the 2016 GMP commenced at the Agnes Water STP during September 2016.
- A copy of latest groundwater monitoring report. Attached is the Annual Report for 2019-2020 and the last Quarterly Monitoring Report March 2020 (the actual last round of monitoring was conducted in September 2020 but the report has not been finalised).
- Project details of the groundwater assessment including timeframe.
   <u>Scope</u> Review of the current groundwater program (Groundwater Assessment was conducted in 2015/2016) for the site to update it to current requirements. Identify suitable locations for the installation of additional groundwater monitoring bores down gradient of the irrigation area that based on the hydrogeology of the site would yield groundwater during the majority of the sampling events.
   <u>Timeframe</u>: This project is new and not in the budget for this financial year. We are currently investigating opportunities to include in this financial year. Where we can include in the budget for this financial year, the aim would be to complete by the end of the financial year. Where no budget is available, we would seek approval of the works for the 21\_22 financial year for completion as a priority.

Please give me a call if you need to discuss the above further.

#### Regards,

From: DELA CRUZ Myra <Myra.delaCruz@des.qld.gov.au>
Sent: Thursday, 3 December 2020 4:06 PM
To: Chris Irving <Chris.Irving@gladstone.qld.gov.au>
Cc: Ethics and Integrity (Mailbox) <EthicsandIntegrity@gladstone.qld.gov.au>
Subject: Agnes Water WWTP - Groundwater Monitoring Results

#### Good afternoon Chris

I tried ringing your office number, so I d thought to send you a quick message since I can t tethold of you.

I am following-up to get some clarification and/or information in relation to non-installation of down-gradient monitoring bores at the Agnew Water STP, which is a requirement of condition WT8-AW(c)(ii) of Environmental Authority (EA) EPPR00959913. In the email referred by Rebecca Griffiths dated 20 November 2020, you stated that **(**currently there is no suitable down gradient monitoring bore at Agnes Water STP**(**), and has previously been identified and there is currently a project to complete a groundwater assessment of the site to guide the installation of a down gradient groundwater bore and other new bores.

The department noted that GRC supplied a copy of Groundwater Management Plan (GMP) for this site on 9 August 2018, which was endorsed dated 9 September 2016. Table 2 of the GMP specifies the location and description of groundwater monitoring bores, which listed six down-gradient bores. The GMP.

To facilitate investigation, the department is requesting GRC to provide information on the following:

- Commencement details of the groundwater monitoring program;
- A copy of latest groundwater monitoring report; and
- Project details of the groundwater assessment including timeframe.

The department requests the information be provided by close of business, Wednesday, 9 December 2020.

Please do not hesitate to contact me if you have further questions regarding this email.

Kind regards,

22-265



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#### -----

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# JUNE 2020 ANNUAL REPORT

September 2020 J169864

## Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

C114943: VB

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#### **Document Control**

Document Quality Management Details.						
Report Name:	June 2020 Annual Report					
Site Details:	Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water					
Project Number:	J169864					
Client Name:	Trility Pty Ltd					
Client Number:	C114943	2				
	Prepared By:	Authorised By:				
Signatures:	sch4p4( 6) Personal information 4( 6) Personal inform Environmental Consultant	sch4p4( 6) Personal information 14p4( 6) Personal informat Principal Consultant - Environment				

#### **Issue Status**

Issue Status		5,00						
Version No.	Date	Creator	Reviewer					
1		4p4( 6) Personal informat	h4p4( 6) Personal informati					
Document Circu	ulation							

#### **Document Circulation**

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## JUNE 2020 ANNUAL REPORT Trility Pty Ltd

#### Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

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# JUNE 2020 ANNUAL REPORT

**Trility Pty Ltd** 

# Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

# **Definitions and Acronyms**

Acronym	Definition	
ALS	Australian Laboratory Services	
ANZECC	Australian and New Zealand Environment and Conservation Council	
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand	
AS/NZS 5667:11	Water Quality Sampling Part 11: Guidance on sampling of groundwaters (1998)	
CoC	Chain of Custody	
EHP	Department of Environment and Heritage Protection	
ERA	Environmentally Relevant Activity	
Greencap	Greencap Pty Ltd	
IWTP	Integrated Water Treatment Plant	
m AHD	metres Australian Height Datum	
mg/L	milligrams per litre	
ML	Mega Litre	
NATA	National Association of Testing Authorities	
NEPM	National Environmental Protection (Assessment of Site Contamination) Measure 1999, as amended May 2013	
QA/QC	Quality Assurance / Quality Control	
RPD	Relative Percent Difference	
SWL	Standing Water Level	
тос	Top of Casing	
Trility	Trility Pty Ltd	
μS/cm	microsiemens per centimetre	
μg/L	mircograms per litre	
WwTP	Wastewater Treatment Plant	





# JUNE 2020 ANNUAL REPORT

**Trility Pty Ltd** 

# Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

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# **1** INTRODUCTION

### 1.1 Background

In 2015, Greencap Pty Ltd (Greencap) was commissioned by Trility Pty Ltd (Trility) to provide advice regarding the site groundwater conditions and monitoring of groundwater at the Gladstone Regional Council owned and Trility operated Integrated Water Treatment Plant (IWTP) and Wastewater Treatment Plant (WwTP) facilities located in Agnes Water, Queensland (**Table 1-1**).

#### Table 1-1Location and ERAs of Facilities

Facility	Environmental Relevant Activity	Location	
Integrated Water Treatment Plant (IWTP)	ERA64-(1a) Water Treatment > 0.5 ML but < 5ML water day	Springs Road Agnes Water - (Lot 52 Plan SP155903 and Lot 41 Plan SP 206868 ( <b>Figure 2-1)</b>	
Wastewater Treatment Plant (WwTP)*	ERA63 (1d) Sewage Treatment >4000 to 10,000EP	Streeter Drive Agnes Water (Lot 20 Plan FD991 and Lot 21 Plan SP168519) ( <b>Figure 2-2</b> )	

\*It is acknowledged that the treated effluent from the WwTP is irrigated to land as identified in the lot and plan provided above.

These two facilities are administered in accordance with the Department of Environment and Heritage Protection (EHP) Environmental Authority EPPR00959913 (hereafter referred to as the Environmental Authority) issued to Gladstone Regional Council on 1 September 2015, with a revised version issued on 14 May 2020.

In accordance with condition WT7-AW of the Environmental Authority, Greencap was engaged to prepare a Preliminary Groundwater Assessment Report for the IWTP in August 2015 and the WwTP in February 2016. The reports presented an overview of the local geological and hydrogeological conditions, and a number of recommendations identified during the assessment were implemented in September 2016. These included Greencap's recommendations:

### IWTP

- Prepare and document a groundwater monitoring program, and provide this to EHP for approval, as required by the Environmental Authority EPPR00959913 (the Environmental Authority);
- Install three additional groundwater monitoring wells at the site, in accordance with the Groundwater Monitoring Program; and
- Ongoing groundwater monitoring, in accordance with the Groundwater Monitoring Program.

### WwTP

- Undertake collar surveys of the existing groundwater monitoring bores so that groundwater level elevations can be determined in reference to Australian Height Datum (AHD);
- Install two up inferred hydraulic gradient bores to enable monitoring of background groundwater conditions;
- Prepare a groundwater management system in accordance with the Environmental Authority conditions that meet the requirements of the Environmental Authority in relation to monitoring groundwater for potential contamination; and
- Undertake the required assessment and reporting of groundwater monitoring results.

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Trility reviewed these reports and agreed to Greencap's recommendations. These recommendations were implemented, commencing May 2016 and groundwater monitoring commenced at the IWTP and WwTP in September 2016 and continues with monthly groundwater level gauging and quarterly water quality monitoring events undertaken by Trility.

### 1.2 Objective

The overarching objective is to comply with requirements of the Environmental Authority issued by EHP in relation to the monitoring of groundwater for the Gladstone Regional Council owned and Trility operated IWTP and WwTP facilities.

The objective of this annual report is to present the quarterly groundwater monitoring results at the WwTP and IWTP from April to June 2020 and summarise the results of monitoring for the annual on JIPAN Contractors Contracto period July 2019 to June 2020 in accordance with Conditions WT8-AW, WT9-AW, WT10-AW and WT11-AW of the Environmental Authority.

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# **2** SITE DESCRIPTION

### 2.1 Integrated Water Treatment Plant

### 2.1.1 Geology

The IWTP is located at Springs Road, Agnes Water on (Lot 6 on SP150900, Lot 40 Plan SP206868, Lot 52 Plan 155903 and Lot 41 Plan SP206868) and is positioned on the coastal dune system between the Reedy Creek coastal swamp and the Coral Sea (**Figure 2-1**).

The basement rocks in the area are the Lower to Middle Triassic age Agnes Water Volcanics. The shoreline to the east of the IWTP is characterised by rocky outcrops and form coastal headlands to the north and south of the IWTP. These volcanics are widespread to the inland of the site. Overlying the volcanics are Tertiary age Elliot Formation sandstones and alluvial sediments. The Elliot Formation is mapped as outcropping in the elevated areas to the west of the Agnes Water.

The Quaternary age coastal dune deposits are a linear sand deposit located immediately adjacent the Coral Sea. These dune deposits reach heights of 50 m AHD in the vicinity of the IWTP. The Reedy Creek Swamp area to the west of the IWTP is mapped as consisting of Quaternary age alluvium.

### 2.1.2 Operations

The IWTP operations can be summarised as follows:

- The IWTP extracts raw water from the adjoining Pacific Ocean via an intake system sited at Chinaman's Beach, and bore water from the Springs Road bores (Figure 3-1);
- Water received at the IWTP is processed via filtration and reverse osmosis systems;
- Water is then chemically dosed to adjust the water properties before distribution to the Gladstone City Council operated potable water network.

The IWTP incorporates the storage and usage of chemicals involved in the water treatment process. These chemicals are stored under cover in designated chemical storage locations and managed in accordance with the IWTP Environmental Management Plan provisions.

### 2.1.3 Potential for Leaks

The potential for impacts on groundwater from IWTP activities are generally restricted to:

- Release of chemicals and materials during their transfers to and around the treatment facility;
- Loss of integrity of bunding and/or containment systems in chemical storage areas;
- Leakages from transfer systems in the plant operational area;
- Sewage pipe leakages; and
- Brine disposal pipe leakages.

Any releases of chemicals, raw materials and/or process by products have the potential to impact on the existing shallow dune aquifer above the rock layer and potentially move west, the inferred groundwater flow direction.

### 2.2 Wastewater Treatment Plant and Irrigation Area

### 2.2.1 Geology

The WwTP is located at Streeter Drive, Agnes Water (Lot 21 on SP168519 and Lot 20 on FD991), and is positioned some 4.5 km inland to the west of the Coral Sea, south-east of a local topographic feature known as Round Hill, within the Deepwater Creek catchment area (**Figure 2-2**).

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The WwTP is situated within the Lower to Middle Triassic age Agnes Water Volcanics. These rocks commonly outcrop in the elevated landforms surrounding and to the north of the WwTP. In addition, these rocks form coastal headlands to the east of the WwTP.

These volcanics are a mixture of igneous rock types, thought to have been deposited in a terrestrial environment. Overlying the volcanics in the WwTP area are Quaternary Age alluvium and colluvium.

### 2.2.2 Operations

The operations of the wastewater treatment plant on site can be summarised as follows:

- Sewage from Agnes Water township is pumped to the site via a number of designated pumping stations, at a volume of no more than 10,000 equivalent persons (EPs);
- Sewage undergoes tertiary treatment (to class B standard) on site through aerobic digestion;
- Following tertiary treatment, treated effluent is retained in a series of specially constructed lagoons; and
- Treated effluent is discharged via irrigation to the designated irrigation area.

### 2.2.3 Potential for Leaks

The potential for impacts on groundwater from WwTP activities is generally restricted to:

- Release of chemicals and materials during transfer to and around the treatment facility;
- Loss of integrity from bunding and/or containment systems in chemical storage areas;
- Leakages from transfer systems in the plant operational area;
- Sewage pipe leakages;
- Leaks from the liner of the treated effluent pond; and
- Deep drainage from inappropriate irrigation practices in the irrigation area.

Any leaks of chemicals and/or contaminants arising from the operation have the potential to impact the aquifer in the Agnes Water Volcanics and shallow alluvial material at the WwTP site.

As groundwater flow is inferred as flowing in a southerly direction, impacts from the release of chemicals and/or contaminants on residents drawing water from this aquifer at Agnes Water is unlikely.

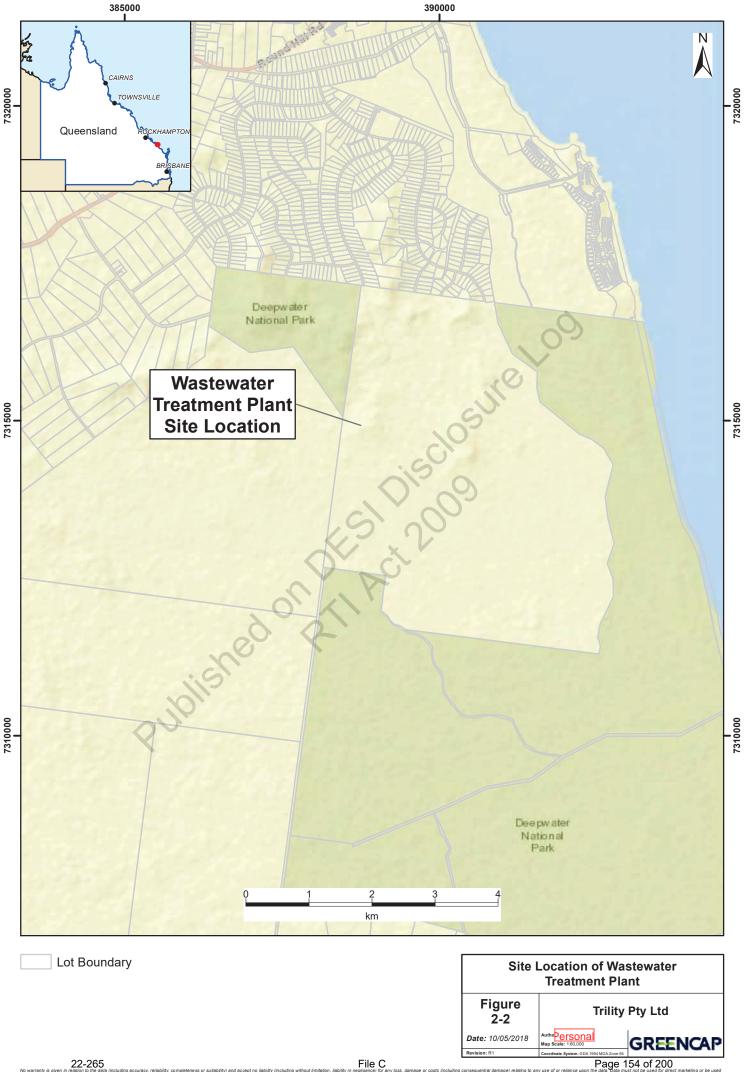
Within the irrigation area, both the shallow local alluvial aquifer and the deeper Agnes Water Volcanics may be present. In both areas, groundwater flow direction inferred to be generally in a southern direction and hence have the potential to be impacted upon by any chemical and/or contaminant releases.

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### 3.1 Integrated Water Treatment Plant

Greencap attended the IWTP on 23 May 2016 to supervise the installation of three groundwater monitoring bores in accordance with condition WT22-AWDP. A surveyor was engaged to provide the coordinates for each monitoring bore and to determine the relative elevation levels.

Following development of the bores, groundwater level gauging was also conducted by Greencap and documented on 25 May 2016 to identify the level of groundwater within the bores. **Table 3-1** below summarises the details of the IWTP groundwater monitoring bores. The locations of the IWTP groundwater bores are shown in **Figure 3-1**.

Well Name	Easting	Northing	Depth of Well (m)	Relative Level (m)	Depth to Water (m) <sup>1</sup>	Relative Height Data (m AHD)
DESAL1	390050.613	7320897.615	6.5	19.117	2.287	16.830
DESAL2	390045.732	7320949.351	6.0	19.555	2.483	17.072
DESAL3	390005.808	7320906.402	5.0	18.739	3.014	15.725

#### Table 3-1 Integrated Water Treatment Plant Groundwater Monitoring Bores

<sup>1</sup> As measured on 25 May 2016.

### 3.2 Wastewater Treatment Plant and Irrigation Area

Groundwater monitoring bores (MP97/01 to MP97/05, MP00/07 and MP00/08) were installed at the WwTP prior to 2008. This was also prior to the management of the facility by Trility. Monitoring of water quality from the supply pipe from the existing bores commenced in September 2008 and has been ongoing on a regular basis.

On 25 May 2016 Greencap inspected all the existing bores and identified that they appeared to be shallow but in good working condition and suitable for monitoring purposes if groundwater is present. At this time Greencap also supervised the installation of two additional groundwater monitoring bores at the WwTP, identified as STP1 and STP2, for the purposes of obtaining information on the background groundwater quality in the area to be able to identify wastewater impacts in comparison with background groundwater quality. A surveyor was engaged to provide the coordinates for all the existing and newly installed monitoring bores at the WwTP and to determine the levels relative to AHD.

Groundwater level gauging was also conducted by Greencap and documented on 25 May 2016 to identify the level of groundwater within bores. **Table 3-2** below summaries the details of the WwTP groundwater monitoring bores. The locations of the WwTP groundwater bores are shown in **Figure 3-2**.



	Table 5-2	wastewater i	reatment riam	Giounawa		Dures
Well Name	Easting, MGA94	Northing, MGA94	Depth of Well (m)	Relative Level	Depth to Water (m) <sup>1</sup>	Relative Height Data (m AHD)
STP1	388929.148	7315839.541	15.36	31.081	0.607	30.474
STP2	389440.292	7314580.914	13.14	10.880	2.915	7.965
MP97/01	388501.285	7315186.657	1.10	19.938	0.959	18.979
MP97/02	388820.691	7313990.578	1.70	9.422	1.154	8.268
MP97/03	389158.188	7313938.606	1.69	8.479	1.342	7.137
MP97/04	389280.803	7313491.850	1.57	7.130	1.108	6.022
MP97/05	388379.765	7312693.071	1.02	6.074	0.784	5.290
MP00/07	388376.341	7314916.325	1.80	15.835	DRY	NA
MP00/08	388215.935	7314808.284	1.785	14.120	1.706	12.414
As measured on 25 May 2016.						

Wastewater Treatment Plant Groundwater Monitoring Bores

Table 3-2

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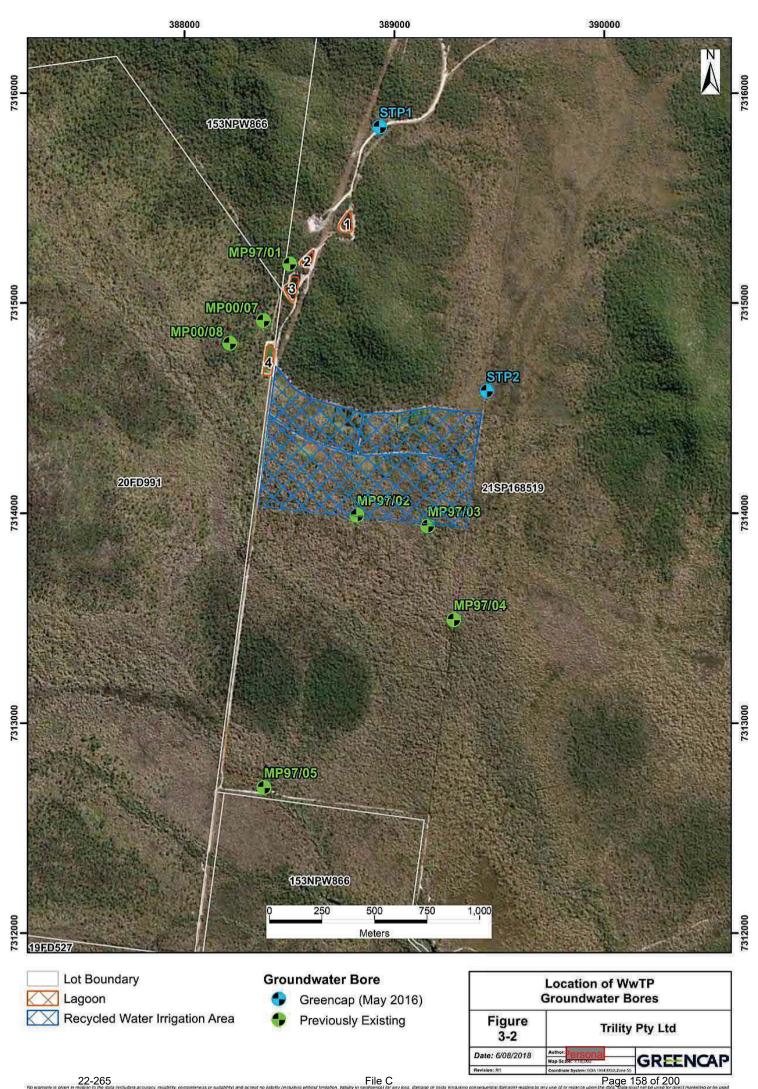
Springs Road 7321000 41SP206868 40SP206868 6SP150900 7320900 DESA 1SP150900 7320800 50 Meters Lot Boundary Location of IWTP Groundwater Bore (Greencap May 2016) **Groundwater Bores** Figure 3-1 Indicative Location of Treated Water Flush Point **Trility Pty Ltd** Indicative Location of Brine Pipe Author: Personal Map Scale: 1:1,200 Date: 9/07/2018 Indicative Location of Seawater Pipe GREENCAP

File C negligence) for any loss, damage or costs (inc

ity, completeness or suitability) and accept no liability (including without limitation, liability in ırs © State of Queensland - Department of Natural Resources and Mines (2015). State bour

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# **4 MONITORING PARAMETERS AND TRIGGER VALUES**

The Environmental Authority for the WwTP sets out which parameters will be monitored and the associated trigger values as part of the regular groundwater monitoring program. These are summarised in **Table 4-1**.

Quality Characteristic	Units	Trigger Values	
Dissolved Oxygen	mg/L		
Total Nitrogen	mg/L as Nitrogen	-Ô	
Nitrate	mg/L as Nitrogen	03	
Ammonia	mg/L as Nitrogen	20% change from background <sup>1</sup>	
Total Phosphorous	mg/L		
Chloride	mg/L		
Electrical Conductivity	uS/cm		
Sulphate	mg/L		
Boron	mg/L		
рН	pH unit	No change from background <sup>2</sup>	
Faecal Coliforms	Colony forming units/100ml		
Enterococcus Organisms	Colony forming units/100ml		
Total Metals: (Al, Fe, Mn, As, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Sn, Zn).	mg/L or ug/L	Within ANZECC Cuidalinas	
Dissolved Metals: (Al, Fe, Mn, As, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Sn, Zn).	mg/L or ug/L	Within ANZECC Guidelines	

#### Table 4-1 Monitoring Parameters and Trigger Values

<sup>1</sup>Trigger values are defined as an upper limit (20% increase from background) with the exception of dissolved oxygen, which is defined as a lower limit (20% decrease from background).

<sup>2</sup> Trigger values are defined as an upper limit – an exceedance is any increase from the background value, with the exception of pH which is defined as any change up or down from the background value.

As the Environmental Authority does not define background data and there is no suitable baseline data for the area, the background value is considered to be the results from the first sampling event for each of the bores. The first sampling event recorded for each bore is listed in **Table 4-2**.

Trigger values for total and dissolved metals are detailed in the Agnes Water Groundwater Management Program and are in accordance with *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (Australian and New Zealand Environment and Conservation Council [ANZECC] and the Agriculture and Resource Management Council of Australia and New Zealand [ARMCANZ], 2000a) (ANZECC Guidelines).

The Environmental Authority for the IWTP does not specify any particular requirements for groundwater monitoring parameters and trigger values. On this basis, the groundwater monitoring parameters and trigger values set out in **Table 4-1** above also apply to the IWTP.





#### Table 4-2

### First sampling event at IWTP and WwTP bores

Bore	Month of first sampling event			
STP1	September 2016			
STP2	September 2016			
MP97/01	September 2016			
MP97/02	December 2017 (All parameters Except <i>E. Coli</i> and Enterococci)			
MP97/03	Not sampled			
MP97/04	December 2017			
MP97/05	December 2017 (All parameters Except <i>E. Coli</i> and Enterococci)			
MP00/07	Not sampled			
MP00/08	Not sampled			
DESAL1	September 2016			
DESAL2	September 2016			
DESAL3	September 2016			
DESAL3				

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# **5 SAMPLING METHODOLOGY**

Monthly groundwater level gauging in WwTP and IWTP bores has been undertaken by Trility in parallel with the quarterly groundwater sampling each September, December, April and June, with reference to industry standards including AS/NZS 5667.11:1998 *Water Quality Sampling – Guidance on sampling of groundwater* (AS/NZS 5667.11).

Groundwater sampling was conducted using low-flow sampling techniques to obtain samples representative of groundwater within the uppermost aquifer which may be impacted. This technique has been recognised by *National Environmental Protection (Assessment of Site Contamination) Measure 1999,* as amended May 2013 (NEPM [2013]).

As indicated by Trility, groundwater bores were purged using a peristaltic pump and sampled via dedicated low-density polyethylene tubing at each location. During purging, groundwater level measurements were recorded to confirm that drawdown within the bores stabilised as required by the low-flow groundwater sampling procedure.

Groundwater quality parameters including pH, temperature, electrical conductivity (EC), salinity, dissolved oxygen (DO), and oxidation reduction potential (ORP) were recorded continually during the purging process using a calibrated YSI Professional Plus multi-parameter water quality meter fitted with a flow-through cell. The samples were collected when these parameters stabilised i.e the purged groundwater is representative of the aquifer conditions. The groundwater sampling records provided by Trility are given in **Appendix A**.

It is understood that decontamination of non-dedicated sampling equipment between each sampled bore was undertaken using a phosphate-free detergent and rinsed with laboratory grade deionised water between sampling locations, in accordance with AS/NZS 5667:11.

Samples used for dissolved metals analysis were filtered in the field using a 0.45  $\mu$ m filter and placed in the appropriately preserved sample bottles provided by the testing laboratory as required for individual analyses.

Samples were stored in a chilled portable cooler immediately after collection and were delivered under similar conditions to the analytical laboratories with accompanying chain of custody (COC) documentation.

The laboratory used for the program was Australian Laboratory Services Pty Ltd (ALS), a laboratory accredited by the National Association of Testing Authorities (NATA) with analysis of the samples being conducted under NATA approved methodologies as required under condition G15-AW (b) of the Environmental Authority.





### **6 MONITORING RESULTS**

A summary of the analytical results is provided in **Appendix B** and is discussed in the sections below. Laboratory certificates and chain of custody (COC) documentation provided by Trility are given in **Appendix C**.

### 6.1 Rainfall

The rainfall recorded for the April to June 2020 quarter was 170.7 mm for the WwTP and 149.2 mm for the IWTP. This was significantly less rainfall compared with the rainfall recorded for the same quarter in 2019 which had 241.6 mm and 289 mm of rainfall at the WwTP and IWTP respectively.

The total annual rainfall recorded at the WwTP and IWTP was 949.5 mm and 929.5 mm respectively for the annual monitoring period (**Table 6-1**). This indicates dryer wet season compared to previous wet season rainfall figures of 1,191.9 mm and 996 mm recorded at locations for the WwTP and IWTP respectively. Rainfall was the highest in February 2020 with the volume comparative to the total volume for the entire October 2019 - March 2020 wet season.

Month	WwTP	IWTP
Jul-19	7.5	12
Aug-19	14.5	17
Sep-19	1.5	0
Oct-19	113.9	117.5
Nov-19	16.75	7.8
Dec-19	46.2	36.05
Jan-20	67.8	54.05
Feb-20	422.65	451.95
Mar-20	88.0	83.7
Apr-20	91.2	77
May-20	38.5	36.0
Jun-20	41.0	36.2
Total	949.5	929.25

# Table 6-1 Rainfall Data

### 6.2 Field Observations during Groundwater Sampling

Groundwater level contour maps for each month within the April to June 2020 quarter for IWTP are presented in Figure 6-1 to Figure 6-6 for WwTP are presented in Figure 6-4 to Figure 6-6.

### 6.2.1 IWTP

Groundwater level gauging results for the monitoring period for IWTP bores are presented in Table 6-2.

	Gi	roundwater Elevation (m Al	HD) <sup>1</sup>
Month	DESAL1	DESAL2	DESAL3
July 2019	16.639	16.769	15.558
August 2019	16.535	16.723	15.512

### Table 6-2 Groundwater Gauging Data, IWTP July 2019 – June 2020

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84	Groundwater Elevation (m AHD) <sup>1</sup>				
Month	DESAL1	DESAL2	DESAL3		
September 2019	16.49	16.606	15.433		
October 2019	16.57	16.704	15.649		
November 2019	16.357	16.49	15.657		
December 2019	16.333	16.415	16.311		
January 2020	16.174	16.311	15.087		
February 2020	17.013	17.11	15.96		
April 2020	16.874	17.032	15.779		
May 2020	16.687	16.860	15.667		
June 2020	16.674	16.82	15.659		

<sup>1</sup> m AHD = metres Australian Height Datum

During the September, December, April and June sampling events the following physical characteristics of the bores were noted by Trility representatives:

• Water colour was generally ranging between light brown and very dark brown; and

The water odours ranged from no odour to very odorous.

#### 6.2.2 WwTP

Groundwater level gauging for the monitoring period for WwTP is summarised in Table 6-3.

Table 6-3	Groundwater Gauging Data, WwTP July 2019 – June 2020
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D.d.o.u.t.h	the Groundwater Elevation (m AHD) <sup>1</sup>								
Month	STP1	STP2	MP97/01	MP97/02	MP97/03	MP97/04	MP97/05	MP00/07	MP00/08
July 2019	29.243	6.888	Dry						
August 2019	29.109	6.794	Dry						
September 2019	29.013	6.685	Dry						
October 2019	28.879	6.560	18.908	8.102	7.124	6.020	5.309	Dry	Dry
November 2019	28.818	6.499	18.658	Dry	Dry	Dry	Dry	Dry	Dry
December 2019	28.776	6.388	Dry						
January 2020	28.678	6.252	Dry						
February 2020	28.836	6.510	Dry	Dry	8.209	Dry	5.749	15.355	13.470
April 2020	28.833	6.738	19.100	8.152	7.129	6.020	5.314	Dry	12.680
May 2020	28.906	6.780	18.974	8.117	7.127	6.015	5.304	Dry	12.445
June 2020	28.856	6.707	19.258	8.112	7.363	6.370	5.948	Dry	Dry

<sup>1</sup> m AHD = metres Australian Height Datum

During the September, December, April and June sampling events the following physical characteristics of the groundwater were noted by Trility representatives:

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- Water colour was generally clear at the STP1 and STP2 bores;
- The water in STP1 was mostly odourless;
- The water at STP2 on occasion was noted to have had a low odour; and
- The MP bores were found to be dry for almost the entire year, likely due to the relatively low rainfall experienced during this annual period compared to previous years.

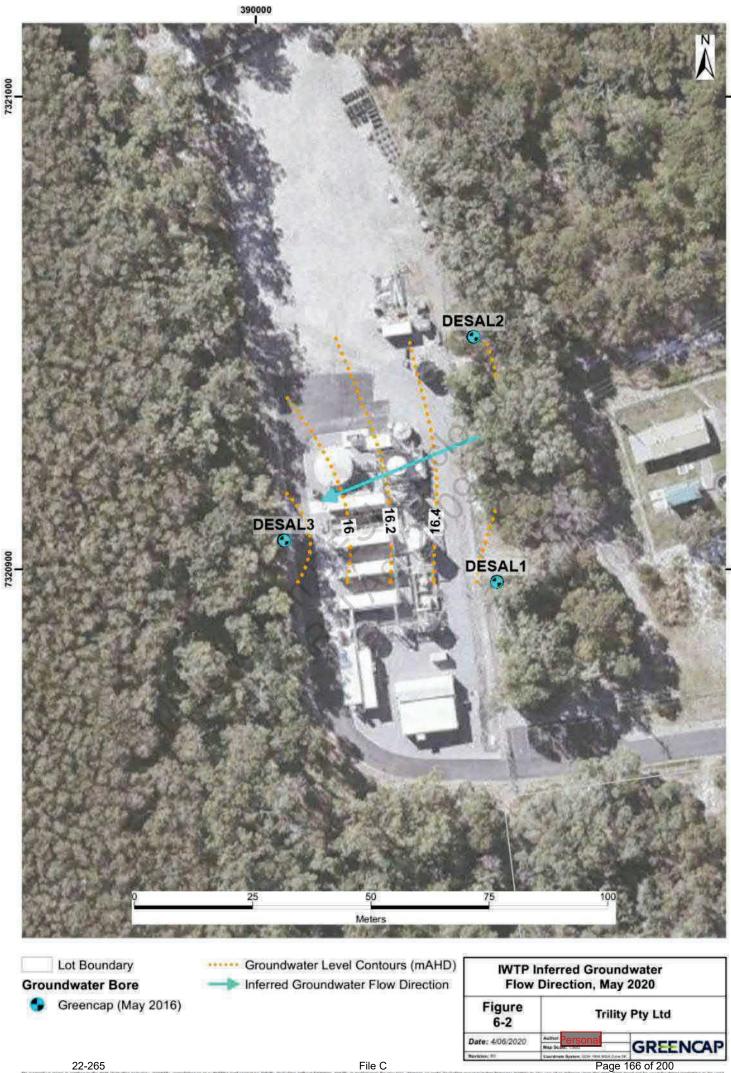
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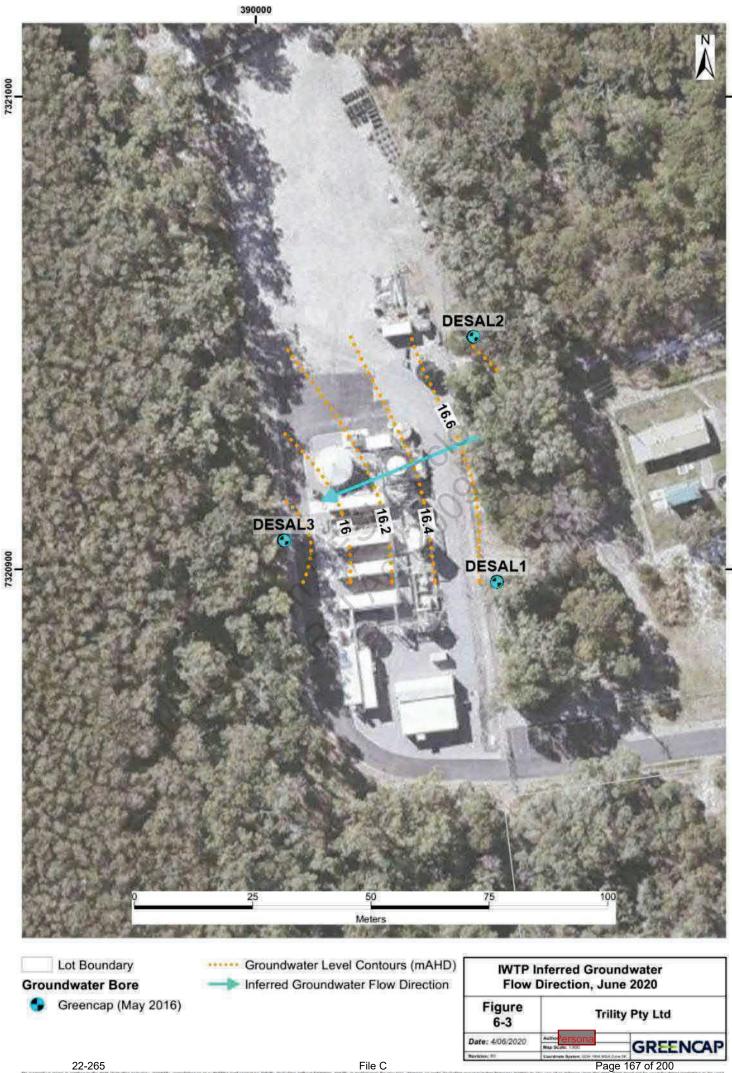
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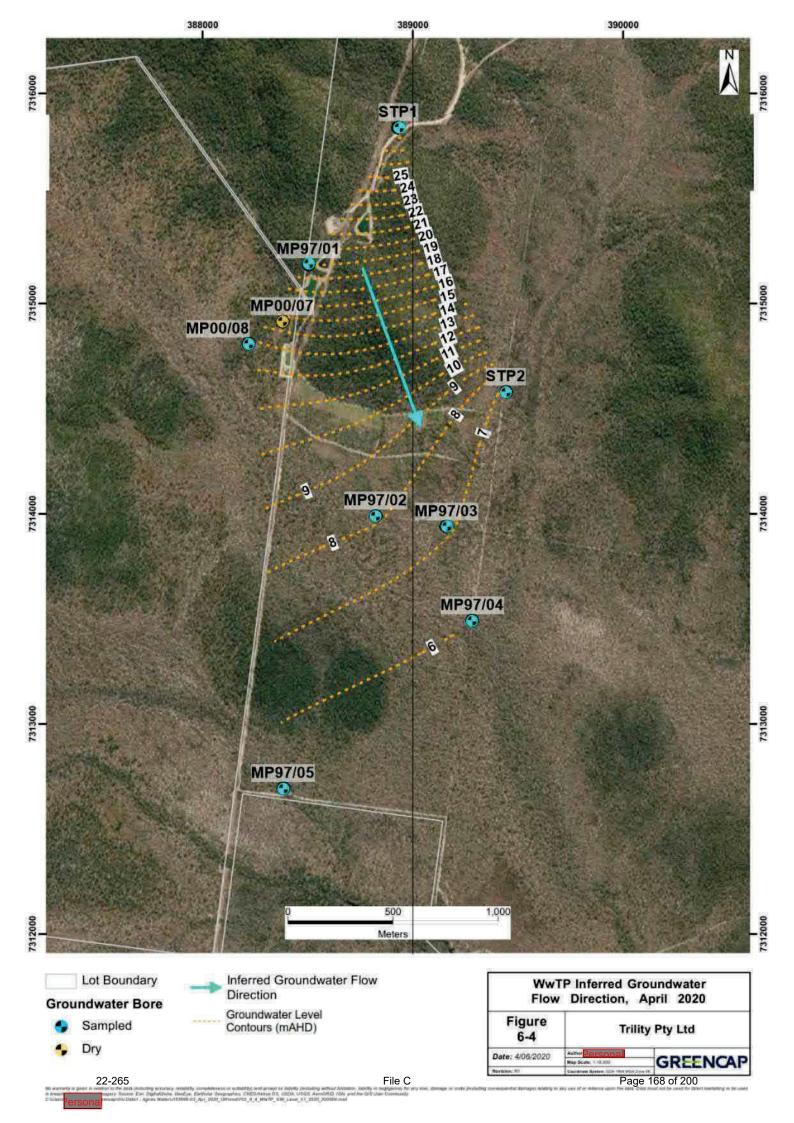
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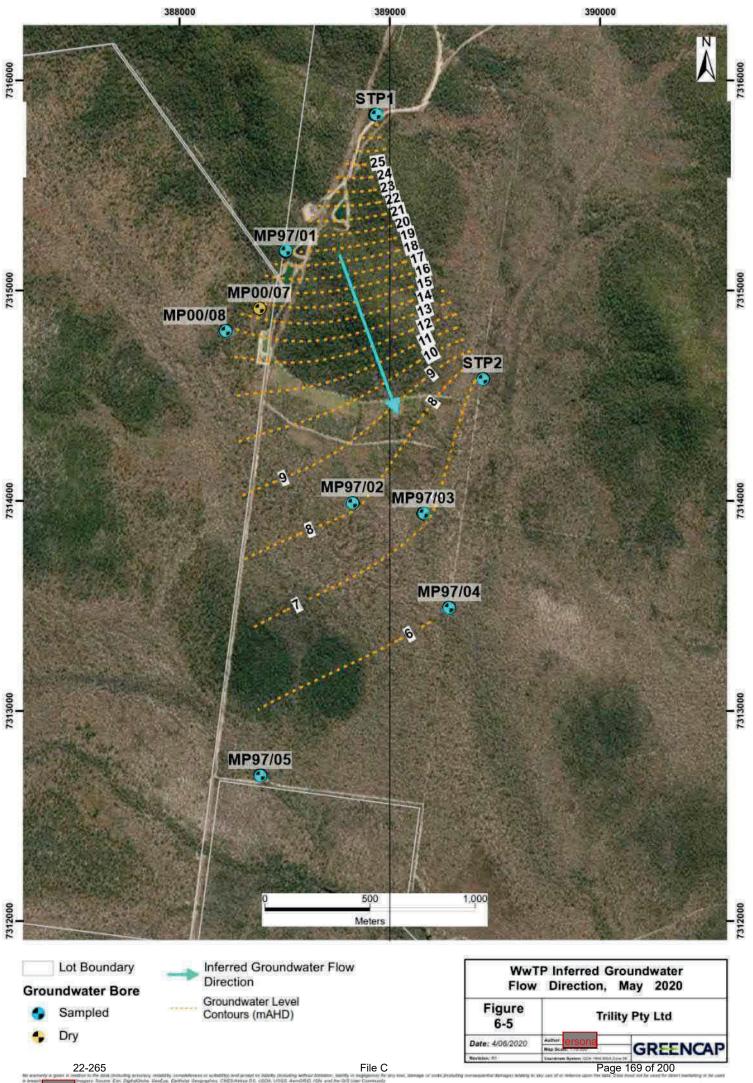


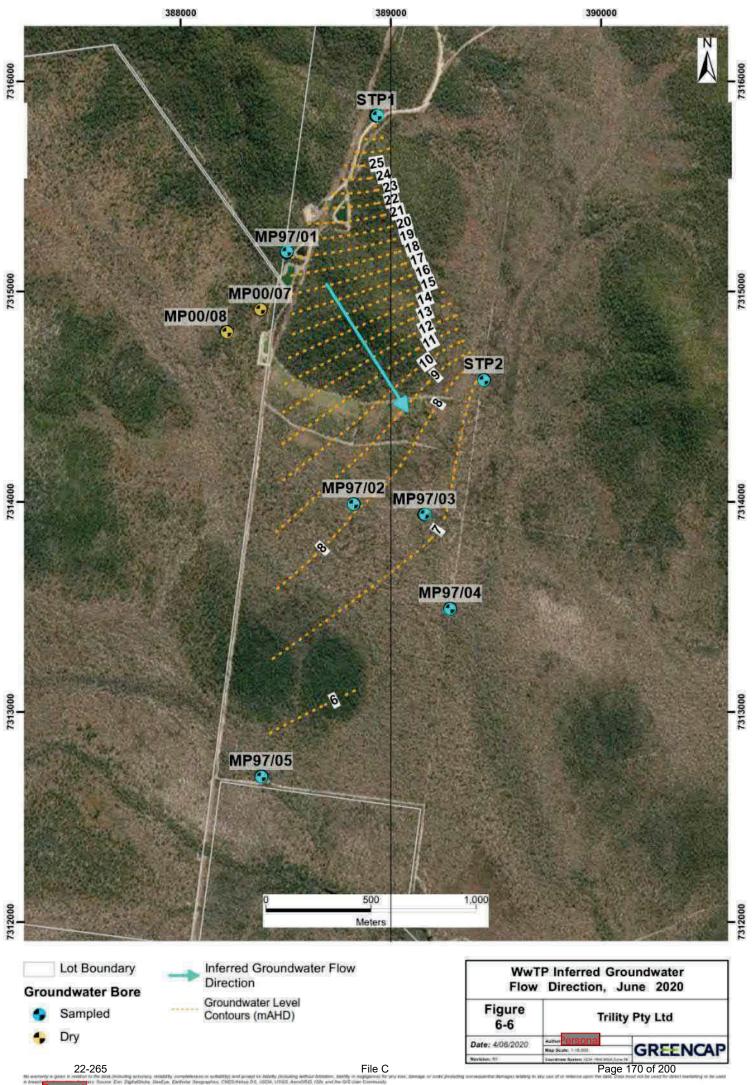
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### 6.3 Field Parameter Measurements

Physico-chemical groundwater quality parameters were monitored during purging and prior to sampling. Parameters measured were pH, electrical conductivity (EC), dissolved oxygen (DO), temperature and oxidation reduction potential (ORP). Samples were collected and tested at all IWTP and WwTP bores that were not dry.

### 6.3.1 June 2020 Quarterly Results

The June 2020 quarterly results are presented in the table below. Gray shading indicates an exceedance of the adopted trigger values (refer Section 4).

	Table 6-4 Field Measured Water Quality Parameters, June 2020							
	Physico-Chemical Parameters							
Monitoring locations	pH <sup>1</sup> (pH Units)	EC <sup>2</sup> (µS/cm)	DO <sup>2</sup> (mg/L)	Temperature <sup>3</sup> (°C)	ORP <sup>3</sup> (mV)			
WwTP			0	9				
STP1	6.67	3,844	0.85	23.7	1.0			
STP2	6.50	12,069	0.49	23.8	80.0			
IWTP								
DESAL1	4.1	343.1	0.18	24.5				
DESAL2	4.3	238.2	0.32	23.8				
DESAL3	5.07	202	0.34	26.3				

### Table 6-4 Field Measured Water Quality Parameters, June 2020

<sup>1</sup> The criteria for pH exceedance is any change from the background-derived trigger value,

<sup>2</sup> The criteria for dissolved oxygen and electrical conductivity exceedance is a 20% change down from the background value,

<sup>3</sup> No associated trigger value

These results indicate that the groundwater within the WwTP bores is generally neutral and within IWTP bores is acidic. These results are consistent with previous quarterly results. The dissolved oxygen is low, which is expected in groundwater aquifers.

The salinity of the IWTP groundwater is indicative of fresh water, whilst the salinity of the background WwTP bores is highly variable and tending towards saline.

### 6.3.2 IWTP Annual Summary

The field results collected from IWTP bores during the monitoring period are summarised as follows:

- Measured pH ranged from 4.1 to 5.07 pH units at the IWTP sites, indicating acidic groundwater;
- Electrical conductivity (EC) results ranged from 202 to 343.1  $\mu\text{S/cm}$  at the IWTP, indicating freshwater;
- Dissolved oxygen (DO) was relatively consistent across the IWTP bores, ranging from 0.18 to 0.34 mg/L;
- Temperature was relatively consistent across the IWTP bores, ranging from 23.8 to 26.3 °C; and
- Oxidation reduction potential (ORP) ranged from -174.6 mV at the downgradient bore DESAL3 to +381 mV at upgradient bore DESAL2. (note: no ORP readings were recorded during June 2020 monitoring event).





Of the parameters listed above, trigger values apply to pH, EC and DO. The following exceedances of the adopted background trigger values were recorded during the monitoring period:

- pH exceedances ranging from 3.6 to 4.74 pH units in all monitoring rounds;
- EC exceedances ranging from 194 to 298.7 µS/cm in all monitoring rounds; and
- DO exceedances ranging from 0.32 to 0.88 mg/L in all monitoring rounds.

### 6.3.3 WwTP Annual Summary

The field results collected from the background WwTP bores during the monitoring period are summarised as follows:

- Measured pH ranged from 6.5 to 6.67 pH units, indicating slightly acidic groundwater;
- Electrical conductivity (EC) results ranged from 3,844 to 12,069 μS/cm at the WwTP, indicating a high degree of variability in salinity levels across the bores at the WwTP;
- Dissolved oxygen (DO) was relatively consistent across the WwTP bores, ranging from 0.49 to 0.85 mg/L;
- Temperature was relatively consistent across the WwTP bores, ranging from 23.7 to 23.8°C; and
- Oxidation reduction potential (ORP) ranged from -24.6 to 119.4 mV.

Of the parameters listed above, trigger values apply to pH, EC and DO. The following exceedances of the adopted trigger values at the background WwTP were recorded during the monitoring period:

- pH exceedances ranged from 6.35 to 6.71 pH units in all monitoring rounds;
- DO exceedances ranged from 0.25 to 1.13 mg/L in all monitoring rounds.

### 6.4 Laboratory Results

### 6.4.1 June 2020 Quarterly Results

Only background bores STP1 and STP2 were found to contain groundwater during the June 2020 quarterly event at WwTP. Other monitoring bores were found to be dry. The groundwater quality exceeded adopted trigger values at the background WwTP bores for:

- Ammonia;
- Chloride;
- Total Nitrogen;
- Total Phosphorus;
- Sulphate as S;
- Dissolved Cobalt;
- Cobalt;
- Nickel;
- Zinc
- Chromium

All three groundwater bores at IWTP were sampled during the June 2020 monitoring event. The groundwater quality exceeded adopted trigger values within the IWTP bores for:

- Ammonia;
- Chloride;
- Nitrate;
- Total Nitrogen;
- Total Phosphorus;
- Aluminium;

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- Dissolved Aluminium;
- Total Chromium;
- Dissolved Chromium;
- Dissolved Copper and
- Dissolved Zinc.

These exceedances are summarised in **Table 6-5**, and **Appendix B-1** presents a summary of the June 2020 reported results, trigger values and exceedances.

Table 6-5	Groundwater Trigger Value Exceedances, June 2020
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Parameter	Trigger Value	Bores Exceeding Trigger Value	Range of Reported Exceedances
Background WwTP Bor	res		
Ammonia	20% change from background	STP1, STP2	0.03 mg/L
Chloride	20% change from background	STP1, STP2	1,020 – 3,850 mg/L
Total Nitrogen	20% change from background	STP1, STP2	0.1 – 0.4 mg/L
Total Phosphorus	20% change from background	STP1, STP2	0.1 – 0.07 mg/L
Sulphate as S	No change from background	STP1, STP2	97 - 379 mg/L
Dissolved Cobalt	1.4 μg/L	STP2	2.0 μg/L
Cobalt	1.4 μg/L	STP2	50 μg/L
Nickel	11 μg/L	STP1	12.0 μg/L
Zinc	8 μg/L	STP2	17.0 μg/L
Chromium	1 µg/L	STP1	2.0 μg/L
IWTP	02		
Ammonia	20% change from background	DESAL1, DESAL2, DESAL3	0.12 – 0.47 mg/L
Chloride	20% change from background	DESAL1, DESAL2, DESAL3	42 – 77 mg/L
Nitrate	20% change from background	DESAL1	0.3 mg/L
Total Nitrogen	20% change from background	DESAL1	1.4 mg/L
Total Phosphorus	20% change from background	DESAL1, DESAL2, DESAL3	0.01 – 0.14 mg/L
Aluminium	55 μg/L	DESAL1, DESAL2, DESAL3	620 – 840 μg/L
Dissolved Aluminium	55 μg/L	DESAL1, DESAL2, DESAL3	610 – 1,000 μg/L
Total Chromium	1.0 μg/L	DESAL1	3.0 μg/L
Dissolved Chromium	1.0 μg/L	DESAL1	3.0 μg/L
Dissolved Copper	1.4 μg/L	DESAL1, DESAL2	2.0 μg/L
Dissolved Zinc	8 μg/L	DESAL2	9.0 μg/L





#### 6.4.2 IWTP Annual Summary

Groundwater exceeded adopted trigger values at some of the IWTP bores for ammonia, chloride, nitrate, total nitrogen, total phosphorous, sulphate, total and dissolved chromium and total copper over the reporting period (refer **Table 6-6**). **Appendix B-2** presents a summary of all reported results and exceedances.

Parameter	Monitoring Period	Bores Exceeding Trigger Value	Range of Reported Exceedances				
Ammonia	September 2019, December 2019, April 2020, June 2020	DESAL1, DESAL2, DESAL3	0.08 – 0.39 mg/L				
Chloride	September 2019, December 2019, April 2020, June 2020	DESAL1, DESAL2, DESAL3	47 – 77 mg/L				
Nitrate	September 2019, December 2019, April 2020, June 2020	DESAL1, DESAL2	0.02 – 0.76 mg/L				
Total Nitrogen	December 2019, April 2020	DESAL1, DESAL2	1.0 – 2.0 mg/L				
Total Phosphorous	September 2019, December 2019, April 2020, June 2020	DESAL1, DESAL2, DESAL3	0.01 – 0.14 mg/L				
Sulphate as S	September 2019, April 2020	DESAL1, DESAL2	2.0 – 5.0 mg/L				
Total Chromium	September 2019, December 2019, April 2020, June 2020	DESAL1, DESAL2, DESAL3	3.0 – 4.0 μg/L				
Dissolved Chromium	September 2019, December 2019, April 2020, June 2020	DESAL3	2.0 – 3.0 μg/L				
Total Copper	September 2019, April 2020	DESAL2, DESAL3	2.0 μg/L				
Public Copper Copper Contract 2013, April 2020 Desited Copper Copper							

Table 6-6Groundwater Trigger Value Exceedances, IWTP July 2019 – June 2020





### 6.4.3 WwTP Annual Summary

Groundwater exceeded adopted trigger values only at the background WwTP bores STP1 and STP2 for ammonia, total nitrogen, total phosphorous, sulphate and boron (**Table 6-7**), noting that these 'exceedances' are not associated with WwTP activities. **Appendix B-3** presents a summary of all reported results and exceedances.

Ammonia       Total Nitrogen       Total Phosphorous       2       Sulphate as S       Boron	Monitoring Period September 2019, December 2019, April 2020 April 2020, June 2020 September 2019, December 2019, April 2020, June 2020 September 2019, December 2019, April 2020, June 2020 September 2019, December 2019, April 2020, June 2020	Bores Exceeding Trigger Value STP1, STP2 STP1, STP2 STP1, STP2 STP1, STP2 STP1, STP2 STP1, STP2	Range of Reported Exceedances 0.18 – 0.25 mg/L 0.1 – 0.4 mg/L 0.01 – 0.07 mg/L 92 – 381 mg/L <50 – 80 μg/L
Ammonia       Total Nitrogen       Total       Sulphate as S       Boron	2019, April 2020 April 2020, June 2020 September 2019, December 2019, April 2020, June 2020 September 2019, December 2019, April 2020, June 2020 September 2019, December	STP1, STP2 STP1, STP2 STP1, STP2	0.1 – 0.4 mg/L 0.01 – 0.07 mg/L 92 – 381 mg/L
Total Se Phosphorous 2 Sulphate as S 2 Boron Se	September 2019, December 2019, April 2020, June 2020 September 2019, December 2019, April 2020, June 2020 September 2019, December	STP1, STP2 STP1, STP2	0.01 – 0.07 mg/L 92 – 381 mg/L
Phosphorous 2 Sulphate as S Boron Se	2019, April 2020, June 2020 September 2019, December 2019, April 2020, June 2020 September 2019, December	STP1, STP2	92 – 381 mg/L
Sulphate as S 2	2019, April 2020, June 2020 September 2019, December		
Roron	•	STP1, STP2	<50 – 80 μg/L
Publish	ed on Pti Ad		

### Table 6-7 Groundwater Trigger Value Exceedances, WwTP July 2019 – June 2020





# 7 QUALITY ASSURANCE AND QUALITY CONTROL

### 7.1 June 2020 Quarterly QA/QC

#### 7.1.1 Field Duplicates

Only intra-laboratory duplicates were collected and tested during the June 2020 groundwater sampling. Calculated relative percent differences (RPD) between primary and duplicate samples were below the acceptable threshold of 50%.

### 7.1.2 Laboratory

A summary of laboratory quality assurance and quality control (QA/QC) data is presented in **Table 7-1**.

Laboratory QA/QC data

Table 7-1

				0.		
Report #	Analysis Within Holding Time	Lab. Duplicate RPD %	Lab Matrix Spike Recovery	Lab. Control Sample	Lab Method Blank	
EB2016548 (IWTP)	Р	Р	СР	Р	Р	
EB2016812 (WwTP)	Р	Р	Р	Р	Р	
P= Pass X = Fail - = not required * = refer to report text					<u>.</u>	
Quality Assurance Criteria	Qu	Quality Control Criteria				
Holding Times	Ac	Accuracy				
Volatile Organic Carbons 14 days soil and water		Matrix spike, control sample: 70-130%, depending on analyte. Surrogate recovery: 50-150%, depending on analyte.				
Semi Volatile Organic Carbons 7 days water, 14 days soil		Precision				
Metals 6 months, Mercury		ethod Blank: Not d plicate: No limit (<	etected 10xLOR), 0-50% (10	D-20xLOR), 0-20%	(>20xLOR)	

As shown in Table 7-1 all analytical laboratory quality control data was within acceptable limits.





### 7.2 Annual Field QA/QC Results

The QA/QC samples collected include:

- Intra-laboratory sample (duplicate assesses reproducibility of results through by the primary NATAaccredited laboratory);
- Inter-laboratory sample (triplicate assesses reproducibility of results through a second NATA-accredited laboratory);
- Field rinsate blank sample (assesses effectiveness of sampling equipment decontamination procedures);
- Field blank sample (assesses potential for sample contamination during sampling); and
- Trip blank sample (assesses for contamination during transportation).

The duplicate/triplicate results were within the adopted acceptance criteria of 30-50% (Australian Standard AS4482.1-2005 *Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds*) relative percent difference (RPD), for samples where results were greater than 10 times the laboratory's limit of reporting.

All blank results we reported below laboratory limits of reporting indicating no cross contamination between samples occurred.

Issues have arisen where laboratory results for dissolved metals have returned higher concentrations than the associated total metal. As indicated by the analytical laboratory used this is likely to be a result of the use of different methods for total and dissolved chemicals. This will be further verified during the next sampling rounds.

### 7.3 Annual Laboratory QA/QC Data

### 7.3.1 Quality Control Measures

Quality assurance and quality control measures for this investigation included:

- Use of standard water sampling procedures, including decontamination of equipment;
- Appropriate sampling containers, sample labelling, preservation, storage and transport under COC procedures;
- Samples submitted to laboratory within appropriate holding times to extract and conduct sample analyses; and
- Use of laboratories that hold National Association of Testing Authorities (NATA) accreditation for the analyses undertaken.

### 7.3.2 Laboratory Quality Control

The analysis of matrix spikes, surrogate spikes, control spike recoveries and laboratory duplicates was undertaken by the laboratory. A review of laboratory quality control is summarised below:

- All samples were received by the laboratory in good condition, chilled and within appropriate holding times for analysis, with the following exception;
- All samples were extracted and analysed within the recommended holding times;
- Laboratory limits of reporting were less than the adopted trigger values in most analytes with the exception of mercury (LOR  $0.1 \mu g/L$ , Trigger Value  $0.06 \mu g/L$ ) and selenium (LOR  $10 \mu g/L$ , Trigger Value  $5.0 \mu g/L$ . However, these analytes are not chemicals of concern and are not considered significant to the outcome of this report.



- The majority of matrix spike recoveries, surrogate spike recoveries and control spike recoveries were within an acceptable range (laboratory's historical statistical range). Some matrix spike outliers occurred during testing. The laboratory advised that the matrix spike recovery was not determined as the background level was greater than or equal to 4x spike level, or that the spike recovery was greater than the upper data quality objective. This was not considered to affect the validity of the data. These analytes were:
  - Samples associated with the WwTP and IWTP batches analysed for sulphate and chloride in September 2019;
  - > One sample associated with the IWTP batch analysed for ammonia in December 2019;
  - One sample associated with the IWTP batch analysed for chloride in April 2020;
  - Samples associated with the WwTP and IWTP batches analysed for Sulphate in June 2020
- Surrogate spike recoveries were reported within the laboratory control limits for all samples; and
- All laboratory sample RPDs were within the acceptable range.

The laboratory noted that total concentrations were less than dissolved concentrations for some metal analytes in both WwTP and IWTP samples at various points during the monitoring period, however the laboratory considered that the difference was within experimental variation. Further explanation should be requested from the laboratory.





## 8 DISCUSSION AND TREND ANALYSIS

The following sections discuss the results of groundwater sampling events conducted during the July 2019 – June 2020 annual monitoring period.

It is important to note that the exceedances for most parameters reported in quarterly reports and in **Section 6** of this report were based on comparison with the results of the initial groundwater monitoring undertaken in September 2016. The result from this single round have been used to develop a set of trigger levels discussed in **Section 4**.

Based on the groundwater sampling results collected to date some variations in chemical concentrations were noted which may be attributable to seasonal variation associated with groundwater level fluctuations and rainfall recharge, rather than groundwater impacts associated with site activities.

Aside from trigger values developed based on the initial groundwater monitoring event, concentrations of metals were also compared against water quality criteria specified by the ANZECC 2000 guideline. Although some exceedances were noted against these criteria, the reported concentrations of metals are likely to be naturally elevated as they we reported in the bores which monitor the background quality of groundwater. Such seasonal variations would need to be assessed to establish true background levels and enable identifications of impacts associated with the site activities.

This section summarises the annual trends in groundwater results and discusses potential causes for the changes in reported concentrations of chemicals of concern and other water quality parameters.

A summary of sampling results is presented in Appendix B, and graphs are presented in Appendix E.

#### 8.1 IWTP

#### 8.1.1 Groundwater Levels

Groundwater levels at the IWTP bores remained relatively consistent during the annual monitoring period, with groundwater level ranging from approximately 15.1 mAHD at DESAL3 to 17.1 mAHD at DESAL2 (Figure 8-1).

The groundwater level contours plotted using September 2019 (dry season) and February 2020 (wet season) gauging data (**Figures D-3** and **D-14**, **Appendix D**) show that the direction of the groundwater flow was to the west and south west (away from the coastline). This remained consistent through both seasons and was consistent with previous monitoring rounds.



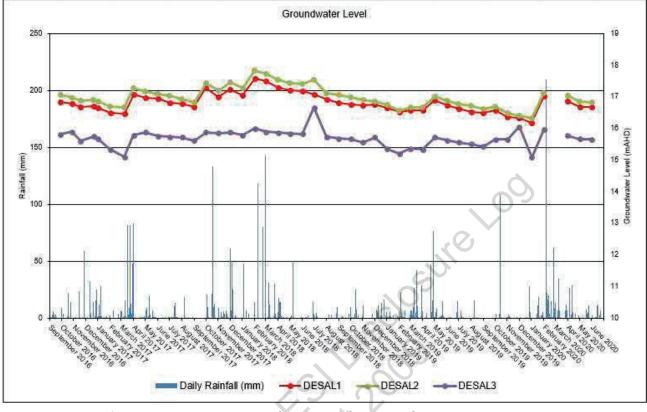


Figure 8-1 IWTP Groundwater Levels, September 2016 – June 2020

### 8.1.2 Field Parameters

Field parameter which have trigger values assigned include dissolved oxygen (DO), electrical conductivity (EC) and pH. The trigger values for DO, EC and pH are based on percentage change or any change from the adopted background value. The data used to assess trends is presented in **Appendix B-2** and the reported values plotted against rainfall are shown in **Figures 1** to **3**, (**Appendix E**).

The following observations were made for field parameters at the IWTP for the annual monitoring period:

- No continuous increasing and/or decreasing trends in DO in all three bores (DESAL1, DESAL2, DESAL3) were noted. DO variations appeared to be associated with rainfalls;
- EC levels in the downgradient bore DESAL3 were similar to the background bores DESAL1 and DESAL2, indicating no noticeable impacts have occurred.
- pH levels remained generally consistent at all three bores, including background and downgradient. pH levels indicated that groundwater was generally acidic at the IWTP.





### 8.1.3 Chloride and Sulphate

Graphs for chloride and sulphate plotted against rainfall are presented in **Figures 4** to **5** (**Appendix E**). The following observations were made for the annual monitoring period:

- Chloride concentrations showed similar pattern to EC levels (discussed above) with no indication of impacts in the downgradient bore DESAL3 throughout the annual monitoring period; and
- Sulphate was not detected within the groundwater with the exception of background bores DESAL2 in January 2020 and DESAL1 in May 2020.

Overall, no particular trends were noted for the monitoring period.

### 8.1.4 Nutrients

Graphs for ammonia, nitrate, total nitrogen and total phosphorus plotted against rainfall are presented in **Figures 6** to **9** (**Appendix E**).

The following observations were made for nutrients at the IWTP for the annual monitoring period:

- Ammonia concentrations increased in all three bores over the annual monitoring period but is still within the historical range. Ammonia level in the background bore DESAL3 has always been higher compared to background bores DESAL1 and 2, with no notable long-term increasing trends.
- Nitrate returned the highest concentration since monitoring began in 2016 at the background bore DESAL2 in July 2019, but has steadily decreased over the monitoring period, consistent with historical results. Nitrate levels fluctuated in the background bore DESAL1 over the monitoring period but were consistent with historical results. Nitrate was not detected within DESAL3 over the annual monitoring period.
- Total nitrogen returned the highest concentration since monitoring began in 2016 at DESAL2 in August 2019, but has steadily decreased over the monitoring period, consistent with historical results.

Variations in nutrients may occur as a result of alteration of the physicochemical conditions in the groundwater. This may result in the conversion of ammonia to nitrate and vice versa as a result of variation in ORP levels. There appears to be no consistent seasonal influences on nutrient concentrations, however as DESAL3 is downgradient and has the lowest nutrient concentrations, nutrients found in the groundwater are unlikely to be a result of site activities.

### 8.1.5 Metals

Graphs for (all dissolved) aluminium, cadmium, chromium (III+VI), cobalt, copper, iron, manganese, mercury, nickel, selenium, tin, and zinc, as well as boron, are plotted against rainfall and presented in **Figures 10** to **22** (**Appendix E**). For the purposes of this discussion, emphasis has been given to the dissolved rather than the total metal results, as metals in the dissolved phases can migrate with groundwater and provide a better indication of potential groundwater contamination.

The following observations were made for metals at the IWTP during the annual monitoring period:

- DESAL1 and DESAL3 showed the same trend in fluctuations of dissolved aluminium, whilst DESAL2 decreased in concentrations over the annual monitoring period. The levels of aluminium in the downgradient DESAL 3 was reported to be higher than background levels
- No concentrations of boron, dissolved cadmium, dissolved mercury, dissolved selenium or dissolved tin were detected above laboratory limits of reporting within any of the three bores over the monitoring period.





- Dissolved chromium and dissolved cobalt were detected within the downgradient DESAL3 in all four monitoring events, however they were not detected within background bores DESAL1 or DESAL2.
- Dissolved manganese and dissolved nickel returned higher concentrations at the downgradient bore DESAL3 compared to the background levels at DESAL1 and DESAL2. The reported levels of these metals have a notable decreasing trend in DESAL3 since initial monitoring rounds in 2016.
- DESAL2 and DESAL3 showed the same trend in fluctuations of dissolved zinc potentially associated with seasonal variations, whilst no dissolved zinc was detected within DESAL1 over the annual monitoring period.

Fluctuations of dissolved metal concentrations during this annual monitoring period do not correlate with changes in the physiochemical parameters (pH, EC, DO). DESAL3, which is downgradient bore, generally has higher concentrations of several dissolved metals compared to DESAL1 and DESAL2, although no increasing trends were evident.

This will be reviewed as data from subsequent monitoring becomes available.

### 8.1.6 Microbiological Parameters

Concentrations of *E. Coli* and Enterococci at the IWTP bores were below the limit of reporting for the entire monitoring period. No further discussion was considered necessary.

### 8.2 WwTP

Groundwater monitoring at the WwTP area is required to assess potential impacts on groundwater quality from treated wastewater disposed via irrigation on an area shown on **Figure 2-2** or as a result of wastewater seepage from the treatment ponds.

As discussed in **Section 6**, several bores (97/01, 97/02, 97/03, 97/04, and 97/05) located down inferred hydraulic gradient from the WwTP facilities and irrigation area were found to be ether dry or did not have sufficient volume of water to collect a sample during all four sampling rounds conducted within this annual period.

### 8.2.1 Groundwater Levels

Groundwater levels at the background WwTP bores remained relatively stable with minor seasonal variations during the annual monitoring period, with groundwater levels ranging from approximately 28.68 to 29.24 mAHD at STP1 and 6.25 to 6.94 mAHD at STP2 (**Figure 8-2**). This range in groundwater elevation is driven by the variation in ground levels.

The groundwater level contours plotted using September 2019 (dry season) and February 2020 (wet season) gauging data (**Figures D-6** and **D-16**, **Appendix D**) show that the inferred direction of the groundwater flow was in a south-easterly direction. This remained consistent through both seasons.



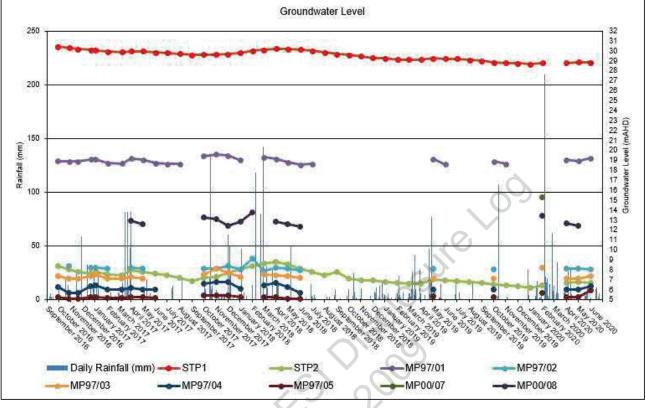


Figure 8-2 WwTP Groundwater Levels, September 2016 – June 2019

### 8.2.2 Field Parameters

The trigger values for dissolved oxygen (DO), electrical conductivity (EC) and pH are based on changes from the background values based on the initial monitoring event conducted in September 2016.

The annual data is presented in Appendix B and plotted against rainfall in Figures 23 to 25 (Appendix E).

It is also noted that only background bores were sampled during this reporting period and the variations in reported values are not attributable the WwTP activities.

The following observations were made for field parameters at the WwTP for the annual monitoring period:

- Variations in DO may be associated with rainfall events;
- Relatively consistent EC levels across the monitoring period with STP1 indicating that the groundwater is slightly saline and STP2 indicating that the groundwater is highly saline; and
- pH levels were relatively consistent, with the pH level indicating slightly acidic to near neutral pH levels.





### 8.2.3 Chloride and Sulphate

Graphs for chloride and sulphate plotted against rainfall are presented in Figures 26 to 27 (Appendix E).

Overall, no notable trends were observed during the monitoring period for chloride and sulphate in the background groundwater.

### 8.2.4 Nutrients

Graphs for ammonia, nitrate, total nitrogen, and total phosphorus plotted against rainfall are presented in **Figures 28** to **31** (**Appendix E**).

The following observations were made for nutrients levels in the background groundwater at the WwTP for the annual monitoring period:

- Ammonia results showed a decreasing trend over the annual monitoring period in STP1 after a spike concentration detected in June 2019. Conversely an increase in ammonia occurred in January 2020 at STP2.
- A small spike in nitrate was detected in April 2020 at STP1 but returned to non-detect in June 2020.
- A small spike in total nitrogen occurred at both STP1 and STP2 in April 2020 but returned to nondetect in June 2020.
- A large spike in total phosphorous was detected in April 2020 at STP2 but returned to non-detect in June 2020. Total phosphorous levels remained consistent throughout the annual monitoring period at STP1.

As these two bores are only background bores were sampled no comments can be made in relation to any impacts from site activities. This will be assessed further when more data becomes available.

### 8.2.5 Metals

Graphs for (all dissolved) aluminium, cadmium, chromium (III+VI), cobalt, copper, iron, manganese, mercury, nickel, selenium, tin, and zinc, as well as boron, are plotted against rainfall and presented in **Figures 32** to **44** (**Appendix E**). For the purposes of this discussion, emphasis has been given to the dissolved rather than the total metal results, as metals in the dissolved phase can migrate with groundwater and provide a better indication of potential groundwater contamination.

The following observations were made for metals in the background groundwater at the WwTP for the annual monitoring period:

- Some variation in boron was noted at STP1 and STP2, with concentrations increasing in December 2019;
- Dissolved copper increased at both bores in August 2019, but was below the laboratory's limit of reporting from October 2019 onwards; and
- Dissolved aluminium, cadmium, chromium, mercury, selenium, tin zinc remained undetected in both bores.

As only background bores were sampled no comments can be made in relation to any impacts from site activities. This will be assessed further when more data becomes available.

### 8.2.6 Microbiological Parameters

Graphs for *E. Coli* and Enterococci plotted against rainfall and presented in **Figures 45** to **46** (**Appendix E**). *E. Coli and* Enterococci were not reported to be present in the background bores STP1 and STP2.

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### 9 CONTAMINATION ASSESSMENT & CONCLUSIONS

While some variations in groundwater parameters were noted at both the IWTP and WwTP sites, these variations were not interpreted to be associated with the onsite activities.

It is important to note that monitoring at the WwTP is limited to only background bore as the bores downgradient from site activities and infrastructure are dry most of the time or the volume of groundwater is not sufficient to fill necessary sampling containers. It is also noted that the depth of pre-existing bores MP97/01, MP97/02, MP97/03, MP97/04, MP97/05, MP00/07 and MP00/08 are all less than 2m, and to obtain better indication of down-gradient groundwater quality, it is recommended that deeper wells are installed in these locations.

On the basis of the information set out above, and the limited record of data as discussed above, the monitoring data reported by Trility during the annual monitoring period at both the WwTP and the IWTP did not indicate the presence of groundwater contamination associated with the onsite activities.

A review of trigger levels was conducted in July 2020 and the results of this review should be adopted and used during the next monitoring events.

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# JUNE 2020 ANNUAL REPORT Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment

Plant, Agnes Water

Appendix A: Groundwater Field Sampling Records

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Adelaide | Auckland | Brisbane | Canberra | Darwin | Melbourne | Newcastle | Perth | Sydney | Wollongong

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50	2L	12-6	0951			213	~		30	393	-
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Odours, sheen	ding Sampling:-			iamples Taken (stals Plastic* lastic unpreserve reserved inorgan lass vials (40mL) lass amber unpre lastic nutrients 60 astic unpreserve astic nutrients 60	eter and turbidity of occedures followed ad inorganics (11 https:(250mL) ) Bearved (500mL) ad inorganics (50 mL green/white d inorganics (50 mL light orean	neter been celibra 7 L)	Standard Statistics	with operation	ng man		
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light 0 w c	ring Sampling:- is, turbidity, wate tann -			iamples Taken (stals Plastic* lastic unpreserve reserved inorgan lass vials (40mL) lass amber unpre lastic nutrients 60 astic unpreserve astic nutrients 60	ater and turbidity of occadures followed ad inorganics (11 les (250mL) ) eserved (500mL ) mL green/white d inorganics (50 )mL light green d inorganics (50 )mL 10 (100mL (100mL) (100m	neler been celibral ?	Standard Statistics	with operation	ng man		
Downer stream	ting Sampling:- is, turbidity, wate tann - odour.			Jamples Takon (stals Plastic* listic unpreserve reserved inorgan lass viels (40mL) lass amber unpre fastic nutrients 60 lastic unpreserve astic unpreserve astic unpreserve	ater and turbidity of occadures followed ad inorganics (11 les (250mL) ) eserved (500mL ) mL green/white d inorganics (50 )mL light green d inorganics (50 )mL 10 (100mL (100mL) (100m	neler been celibral ?	Standard Statistics	with operation	ng man		
DOW C	Ing Sampling:- is, turbidity, wate tank - bdd ur.			Jamples Takon (etals Plastic* liastic unpreserve reserved inorgan lass viels (40mL) lass amber unpre fastic nutrients 60 astic unpreserve astic unpreserve DESIGNATES S	ater and turbidity of occadures followed ad inorganics (11 les (250mL) ) eserved (500mL ) mL green/white d inorganics (50 )mL light green d inorganics (50 )mL 10 (100mL (100mL) (100m	neler been celibral ?	Standard Statistics	with operation	ng man		
Daw C	Ing Sampling:- is, turbidity, wate tank - bdd or			iamples Taken fetals Plastic* lastic unpreserve reserved inorgan lass vials (40mL) lass ambar unpre astic nutrients 60 lass ambar unpre astic unpreserve astic unpreserve astic unpreserve DESIGNATES S,	ater and turbidity of occadures followed ad inorganics (11 hes (250mL) ) eserved (500mL d inorganics (50 mL green/white d inorganics (50 mL light green d inorganics (25 AMPLES Fill TE	neler been celibra ?	Standard Statistics	with operation	ng man		
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Downs, shear Lott Down Down Down Down Start Stat	ting Sampling: is. turbidity. vate tannin = bdoor. L VOLUMES:- sing: iled: only is a around casing a = 0.31(3) + (1)	er colour, sta i v	0.000000 m3 0.000000 m3	iamples Taken fetals Plastic* lastic unpreserve reserved inorgan lass vials (40mL) lase amber unpre astic nutrients 60 astic nutrients 60 astic unpreserve astic unpreserve DESIGNATES S, m n (kL) (kL) (kL)	eter and turbidity of occadures followed ad inorganics (11 hes (250mL) ) eserved (500mL d inorganics (50 mL green/white d inorganics (50 mL light green/ d inorganics	neler been celibra ?  L)  L)  DOML)  RED IN FIELD)  er metre er metre er metre	Standard Statistics	with operation	ng man		
Odours, shear Light O and C ITORING WEL eler of well can eler of hole dri hume of annufus tal Bors Volume suming 30% po	L VOLUMES:- sing: lifed: only is around casing s = 0.3°(3) * (1) rosity in sand/gra	er colour, sta i v	0.000000 m3	iamples Taken fetals Plastic* lastic unpreserve reserved inorgan lass vials (40mL) lase amber unpre astic nutrients 60 astic nutrients 60 astic unpreserve astic unpreserve DESIGNATES S, m n (kL) (kL) (kL)	eter and turbidity of occadures followed ad inorganics (11 Nes (250mL) ) eserved (500mL) ) mL light green/white d inorganics (50 )mL light green Light green/white d inorganics (50 AMPLES FILTE 0.00 L p 0.00 L p	neler been celibra ?  L)  L)  DOML)  RED IN FIELD)  er metre er metre er metre	Standard Statistics	with operation	ng man		
Downs, shear Lott Down Down Down Down Start Stat	L VOLUMES:- sing: lifed: only is around casing s = 0.3°(3) * (1) rosity in sand/gra	er colour, sta i v	0.000000 m3 0.000000 m3	iamples Taken fetals Plastic* lastic unpreserve reserved inorgan lass vials (40mL) lass amber unpre lastic unpreserve astic unpreserve destic unpreserve DESIGNATES S m n (kL) (kL) (kL) (kL)	eter and turbidity of occadures followed ad inorganics (11 hes (250mL) ) eserved (500mL d inorganics (50 mL green/white d inorganics (50 mL light green/ d inorganics	neter been celibra ?	Standard Statistics	with operation	ng man		



DESAL

### Groundwater Monitoring Standing Water Level Measurement

\*\*NB\*\* Measurement to be taken in mm from top of bore casing

Date	Time	Operator	Desal 1	Desal 2	Desal 3
1-9-2016	1300		2210	2440	2985
27.9 2016	10:00		2.275	2500	3.992
18-10-2016	11.45		2334	2575	2845
15.11.2016	2.50pm		2440	2672	3142
14.12.2016.	0910ml		2405	2650	2995
19.1.2017	0745		2461	2698	3072
27.2.2017	0230		2627	2860	3402
8.3.2011	0930		2650	2589	3642
18/4/2017	3 30000		2051	2278	29.53
19 5 2017	11:30m		2135	2372	2460
21-8-2017	9.30		2170	2470	2980
20-7-2017			2240	2510	29.98
23-8-2017	8.1011		2317	2627	3017
29-9-2017	9110 Am		2425	2718	3120
26/10/2017	3 am		1825	2120	2554
20/1/2017	120m		2120	2344	2892
14 12 17	8 30		1883	2085	2862
21.1.18	1:10gan		2065	2280	2950
27.2.18	8-30 A.M		1522	1788	2745
27.3.18	9.00 A.M	4p4( 6) Personal inform		1830	2846
27-4-18	3-30pm		1834	2023	2875
13-5-15	8:15		1912	2123	2896
4-6-18	9.00 J.M		1930	2150	2912
6-7-18	9.10 a.m.		2030	2023	2083
03-8-18	11.100.00	PA	2210	2441	3001
19-9-18	9-00 mm		2296	2498	3058
8-10-18	Guz AM		2350	2572	3072
29-11-18	13:06 pm		2370	2660	3175
18-12-18	9.00 A.M	_	2765	2692	3016
31-1-19	16:00 pm		2475	2810	3390
28-2-19			2587	2980	3535
25-3-19			2530	2882	3375
10-4-19	8.10 A.M		2547	2889	3401 3012
27-5-19	1230pm		2234	2552 2681 2786	3012
24-6-19	9.00 Am		2380	2681	8110
31-7-2019	7.20 A.M		2478	2786	3181
16.8.19	5.30 pm		2582 1	2832	3227
16.9.19	8.45 pm		2627	2949	3306
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ALAMICANSIC	ar Sampling I	Record									A A A A A A A A A A A A A A A A A A A
Client:	Tolity	Anna - 12 - 12 - 12 - 12 - 12 - 12 - 12 - 1				22					ENCA
Project: Location:	Groundwater t Agnes Water,	pore Installation : QId	and sampling			Job No: Sampled by: Date:	· · · ·	rsonal info	1	the families where the second second	
	Mart and the other strength	WELL DETAIL	S		TOALUDI UNIO IS	and the second second second second second	6-12-1	· /	1	(analasina salatanga para	
0		Well depth:	1	5.5 (0)	SAMPLING E	ce: Peristeliic (io		Marcallan Press		1	The second s
Vaca	( )	Well diameter:		o me	Water mater:	ce. Pensianic (lo	IW NOW)	GEOH	V	1000	
0-0-	1 1	Casing type: Initial water lev		puc	Turbidity Mele	ri		YSI# TM#	10	The	
Time	Amount	Gumulative	Water Leval	784 (m Temperature	) Interphase pro			IP#	1		
Manager patrice and	purged (L)	purged (L)	(m)	°C °C	DO % sat	Sp. Conductivit µS/cm			pH	ORP	Turbidity
9.00	ah	22	2796	25.0	1	The second second second second	PSU	the second se	nis	mV	NTU
9.04	DL	HL		The second secon	0.62	271		3-8	516	188	
9.08	and and all shakes and	and the second division of the second divisio	2794	25-1	0.23	273	-	3.8	8	215	-
	21	62	2795	25.2	0.33	252		3.8	7	the state of the local division of the local	
5-12	24	18L	2795	25-2	0.52	. The second second	-			333	-
7-16	22	IOL	2795	25-2		281		J.8	6	241	-
3.20	24	and the second design of the second	1 marshared man		0.67	286	-	3-5	PG	248	-
9.24		124	2795	25.2	0.87	279	_	3.8	1	and a second second second	
and the second s	32	ILL	2795	25-2	0.88				11	248	-
9.28	7-	164	2795	25-2	A CONTRACTOR OF A CONTRACTOR A CONTRA	380		3-8		248	-
					0.88	278	-	3.8	37	248	-
				any	10 20	llecta	2			1 acom	+
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abilisation Criteria	(3 teadiane							-	-	-	1
(nin ranges)	CHO-MILLING CONTRACTOR	N/A	Drawdown			C					
mn ranges)	CHO-MILLING CONTRACTOR	N/A tivities, weather	Drawdown ≪10cm	# 10%	± 10%	* 5%	± 10%	±0,	1	* 10mg	
nin ranges) ald observation	ns: eg. Nesrby zo	tivities, weather	<10cm	± 10%	# 10%	· 3'5%	* 10%	20.	With the state of	± 10my	N/A
NE (	ns: eg. Nesrby sc سار می کرج ing Sampling:-	livities, weather 140 f	<10cm	es water quality me	SES A	eler been celibrate Yes	9				
NE (	ns: eg. Nesrby sc سار می کرج ing Sampling:-	livities, weather 140 f	<10cm	es water quality me scontaminstion pro	SES A	200	9		ng man	val and recorded?	Yes
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NE (	ns: eg. Nesrby sc سار می کرج ing Sampling:-	livities, weather 140 f	<10cm	es weter quality me scontaministion pro amptes Taken stals Plastic*	elef and furbidity m	elar been calibrate Yes	ed in accordance	a with openat	ng man	val and recorded?	Yes
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ITORING WELL eter of well casis eter of kell casis eter of hole drilli-hole ume of casing on ume of cannons all Bore Voluma	ing Sampling:- ing Sampling Sampling:- ing Sampling:- ing Sampling Sampling Sampling:- ing Sampling Sampli	tivities, weather Hot roolour	<10cm	es water quality me accontaministion pro amples Taken etals Plastic* eserved inorgani res vials (40mL) res amber unpre stic nutriants 60 stic nutriants 60 estic unpreserved stic nutriants 60 estic unpreserved estic unpreserved e	d inorganics (1L cs (250mL) mL grean/white I inorganics (500mL) Inorganics (500mL) Inorganics (500mL) MPLES FILTER 0.00 L per 0.00 L per 0.00 L per 0.00 L per	elar been celibrate Yes ImL) mL) ED IN FIELD)	ed in accordance	a with openat	ng man	val and recorded?	Yes
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### ENCAP In Point undwater Sampling Record

#### 11: Trility Groundwater bore installation and sampling Job No: :IDI Sampled by: tion: Agnes Water, Old Date: 16-12-19 WELL DETAILS SAMPLING EQUIPMENT Well depth: 0 6 (m) Sampling device: Peristaltic (low flow) GEO# Well diameter: 50mm Water mater: DEO YSI# Casing type: pu, Turbidity Meter: TM# Initial water level Water Level Ter (m) Interphase probe Amount Cumulative IP# Time Temperature DO Sp. Conductivity Salinity purged (L) purged (L) DI-ORP (m) % sat °C Turbidity µS/cm PSU 9.40 Units mV 21 NTU 26 3145 23-9 197 0.98 3-84 7.44 320 21 HL 3145 23.9 197 1-02 3.84 7.48 250 JL 61 3146 23.9 1-08 197 3.86 9.52 256 24 8L 3146 23.9 0.91 195 3-84 956 281 2L 3146 IOL 23.9 0.93 196 3-28 10.00 289 FL 3146 126 23.9 .97 192 0 3. 71 292 10.04 FL 14L 7146 9 23 0.98 194 3-71 292 lecter an tion Criteria (3 readings Drawdown <10cm N/A (86<u>0</u>n \$ 10% # 10% oservations: eg. Nearby activities, weather \$ 5% \$ 10% 20.5 ± 10my N/A

NE Winds, Hot

Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes Decontamination procedures followed? Yes tions during Sampling:rs, sheens, turbidity, water colour Samples Taken Number Duplicle QA Triplicate: QA Metals Plastic\* Order Plastic unpreserved inorganics (1L) Preserved Inorganics (250mL) Glass vials (40ml.) Mode Glass amber unpreserved (500mL) Plastic nutrients 60mL green/white Plastic unpreserved inorganics (500mL) Plastic nutrients 60mL light green low tomer stai Glass amber unpreserved (100mL) Plastic unpreserved Inorganics (250mL) (\* DESIGNATES SAMPLES FILTERED IN FIELD) 1 ING WELL VOLUMES:f well casing: mm f hols drilled: mm of casing only 0.000000 m3 (kL) of drill-hole 0.00 L per metre 0.000000 m3 (kL) of annulus around casing 0.00 L per metre 0.000000 m3 (kL) re Volume = 0,3\*(3) + (1) 0.00 L per metra 0.000000 m3 (kL) g 30% porosity in sand/gravel pack) 0.0 L.Im niclan #1 Field Technician #2

GREENCAP



Project: Location:	Trilly Groundwater Agnes Water,	CONTRACTOR OF THE OWNER	The second second second second	A Martin Martin Martin Construction		Job No: Sampled by: Date:	*			6) Personal inf	
		WELL DETAIL	S	NUMBER OF CONTRACTOR OF CONTRA	SAMPLING E	AL FIGLACAIT		of sector side at	1	the second second	Lawrence and the second
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Desel	5	Well diameter:		Orm	Water mater:	se. rensianc (io	w now)	GEO#	Lu	24-	Contrast of the second
		Casing type:	11.51	pue	Turbidity Mete			YSIM	11	PRO	
an and the Commission	and the second se	Initial water lev	el:	897 (m)	Interphase pro	ri Inan		TM#	1		
Time	Amount purged (L)	Cumulative	Water Lavel	Temperature	DO	Sp. Conductivit	Salinity	IP#	1	· · · · · · · · · · · · · · · · · · ·	
10.15	A second contraction of the second	purged (L)	(m)	°C	% sat	µS/cm	PSU	U.	nus	ORP mV	Turbidity
	2	26	2810	36.6	1.24	207		4.	Statute and	-123	NTU
10.19	2	46	2817	26.7	1.28	208			Contraction of the local division of the loc	1	-
1023	2	64	2820	26.6	1.48	209		4.	All and the second second	-143	
10.27	2	86	2820	26.6	1.50	215		4.	10192	-151	-
10.31	2	IOL	2820	26.6	1.51			4-	71	-154	*
10.35	2	122		The second second		208	-	4.	23	-155	
A		1+6	3821	266	1.51	205	~	4.	72	- 155	
			D¢	mple	colle	Iso.					
									121		
					Hermonia Contra		2				
							5	İ			
pilisation Criteria In renges)	1058	N/A	Drawdown	± 10%		0		1.			
d observation	18: eg. Nearby ac	Hulfing meather	<10cm	210%	# 10%	\$ 5%	* 10%	*0.	1	± 10my	NA

NEW. NOS , Hot . fre

Hes water quality meter and terbidity meter been celibrated in accordance with operating manual and recorded? Yes Decontamination procedures followed? Yes **Observations during Sampling:**sg. Odours, sheens, turbidity, water colour Samples Taken Dupliciel QA Number Metals Plastic\* Triplicate: QA Order Janus stain , oder ou Plastic unpreserved inorganics (1L) Preserved inorganics (250mL) Glass vials (40mL) Glass amber unpreserved (500mL) Plastic nutrients 60mL green/white Plastic unpreserved inorganics (500mL) Plastic nutrients 60mL light green Glass amber unpreserved (100mL) Plastic unpreserved inorganics (250mL) (\* DESIGNATES SAMPLES FILTERED IN FIELD) ONITORING WELL VOLUMES:ameter of well casing: amater of hole drilled: mm Volume of casing only mm 0.000000 m3 (ki.) Volume of drill-hole 0.00 L per metre Volume of annulus around casing 0.000000 m3 (kL) 0.00 L per metre 0.000000 m3 (kL) Total Bore Voluma = 0.3\*(3) + (1) 0.00 L per metre (assuming 30% porosity in sand/gravel pack) 0.000000 m3 (kL) 0.0 L/m id Technician #1 Field Technician #2

# GREENCAP

lient: roject: ocation:	Trility Groundwater b Agnes Water, (	ore installation ar ସାd	nd sampling			Job No: Sampled by: Date:		1(6) Personal 5-4-2		
		WELL DETAILS	1		SAMPLING EQ	UIPMENT				
		Well depth:	6.5	(m)	CONTRACTOR OF THE OWNER OWNER OF THE OWNER O	e: Peristaltic (low I	Row)	GEO#		
	1	Well diameter:	50 m		Water meter:			YSI# / PL	0+	
DESP	LI	Casing type:	PUC		Turbidity Meter			TM#		
v -		Initial water leve	1: 7,24	-3 (m)	Interphase prot		the second second	IP#		
Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature °C	DO % sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
11-27	2	2	2.252	26.0	0.12	338.8		3.88	238.1	
11.31	2	4	2-252	26.2	0.11	324.5		3.90	219.3	_
11.35	2	6	2.252	26.2	0.15	311-6		3.95	208.4	_
11-39	2	8	2-252	26.3	0.22	303-6		3,97	199.4	
11.43	2	10	2.252	26:3	0.27	302.0		3.98	193.1	
11-47	2	12	2-252	26.3	0:29	301.0		3.98	186.7	
11.51	2	14	2:252	26.3	0.30	300.2		3.99	182.1	
11-55	2	16	2.252	26.3	0.31	299.6		3.99	178.9	
11-59	2	18	2-252	26.3	0:32	297.1	0	4.00	174.9	
12:03	2	20	2-252	26.3	0.32	298.7	10	3099	172.4	
			SAMPL	ES TZ	AKEN					
							2			
_						G				
tabilisation Crite ithin ranges)	ria (3 readings	N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

FIME, SLIGHT SOUTHERLY BREEZE

Observations during Sampling:-	Samples Taken	Number	Duplicte: QA	Triplicate: QA	Order
eg. Odours, sheens, turbidity, water colour	Metals Plastic*	_	_		
COLOUR BUT NOT TURBE	D.				
	Plastic unpreserved inorganics (1L)				
	Preserved inorganics (250mL)				
	Glass vials (40mL)				
	Glass amber unpreserved (500mL)		1		
	Plastic nutrients 60mL green/white				
	Plastic unpreserved inorganics (500mL)				
	Plastic nutrients 60mL light green				
	Glass amber unpreserved (100mL)		1		
	Plastic unpreserved inorganics (250mL)				_
	(* DESIGNATES SAMPLES FILTERED IN FIE	LD)			

MONITORING WELL VOLUMES:-Diameter of well casing: mm Diameter of hole drilled: mm 0.00 L per metre (1) Volume of casing only 0.000000 m3 (kL) (2) Volume of drill-hole 0.000000 m3 (kL) 0.00 L per metre 0.000000 m3 (kL) 0.00 L per metre (3) Volume of annulus around casing (4) Total Bore Volume = 0.3\*(3) + (1) 0.000000 m3 (kL) 0.0 L/m (assuming 30% porosity in sand/gravel pack)

Field Technician #1

# GREENCAP

	Trility Groundwater b Agnes Water, (	ore installation a	nd sampling			Job No: Sampled by: Date:		p4( 6) Persona		
DESA	L2	WELL DETAILS Well depth: Well diameter: Casing type: Initial water levi	6.0 Dini PVC	n	SAMPLING EC Sampling device Water meter: Turbidity Meter Interphase pro	ce: Peristaltic (low ) t be:		TM# IP#	20+	
Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature °C	DO % sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
10-10	2	2	2.530	24.7	0.24	292.2		416	1350	
10-14	2	4	2.530	24.7	0.16	286.0		403	163.3	
10-18	2	6	2.532	24.8	0.16	304.0		3.99	186.2	
10.22	2	3	2.532	24-8	0.19	311.0		3.91	190.0	
10.26	2	10	2.532	24.8	0.22	314.2		3:89	191.8.	
10-30	2	12	2.532	24-8	0.26	3/4.0		3.87	129.6	
10.34	2	14	2.532	24-8	0.28	313.3		3.90	186.8	
10.38	2	16	2.532	24-8	0.29	31107		3.91	186-2	
10-42	2	18	2.532	24-8	0.31	3/3.6.		3.94	185.3	
10.46	2	20	2.532	2408	0.31	313.6	30	3.92	180.6	
the life			SAM		TAKE					
							2			
						G				
Stabilisation Crite vithin ranges)	ria (3 readings	N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

FINE, SLIGHT SOUTHERLY BREEZE

Observations during Sampling:-	Samples Taken	Number	Duplicte: QA	Triplicate: QA	Order
g. Odours, sheens, turbidity, water colour	Metals Plastic*	_			
TURBID					_
	Plastic unpreserved inorganics (1L)				
	Preserved inorganics (250mL)				
	Glass vials (40mL)				
	Glass amber unpreserved (500mL)				
	Plastic nutrients 60mL green/white				
	Plastic unpreserved inorganics (500mL)				
	Plastic nutrients 60mL light green				
	Glass amber unpreserved (100mL)				
	Plastic unpreserved inorganics (250mL)				

MONITORING WELL VOLUMES:-	Contract of the second		
Diameter of well casing:	mm		
Diameter of hole drilled:	mm		
(1) Volume of casing only	0.000000 m3 (kL)	0.00 L per metre	
(2) Volume of drill-hole	0.000000 m3 (kL)	0.00 L per metre	
(3) Volume of annulus around casing	0.000000 m3 (kL)	0.00 L per metre	
(4) Total Bore Volume = 0.3*(3) + (1)	0.000000 m3 (kL)	0.0 L Im	
(assuming 30% porosity in sand/gravel paci-	k)		

Field Technician #1

lient: roject: ocation:	Trility Groundwater bo Agnes Water, C	ore installation ar	nd sampling		Job No: Sampled by: Date:					
		WELL DETAILS	3		SAMPLING EC	UIPMENT				
		Well depth:	5.0	(m)	Sampling device	e: Peristaltic (low f	low)	GEO#	1000	7 10
					Water meter: YSI# - PRU+					
VES	IL D	Casing type:	RIC.		Turbidity Meter			TM#		
		Initial water leve	al: 296	O (m)	Interphase proi	be:		IP#	000	Tablella
Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature °C	DO % sat	Sp. Conductivity µS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
0830	2	2	3.264	27.6	0.12	198.7		4.86	-109.8	
0834	2	4	3.323	27.7	0.22	199.1		4.83	-139:7	
0838	2	6	3:328	27.6	0.36	200.6,		4.81	-155.7	
2842	2	8	3.342	27.7	0.39	204-6		4.83	-159.7	
0846	2	10	3:350	27.7	0.41	205,4	<u></u>	4.82	-167.2	
0350	2	12	3.360	27:7	0.42	207.9		4.82	-171-9	
0854	2	14	3.370	20.6	0.42	209.1		4.82	-173.2	
0858	2	16	3.376	27.6	0.42	211.1		4.82	-175.8	
0902	2	18	3.382	27.6	0.42	211-1	.01	4.83	-177-9	
0906	2	20	3.386	21-4	0.43	21203		4.32	-177.7	
0910	2	22	3:392	27-6,	0.43	219.0		4-82	1	0.000
0914	2	24	3.396	27-0	5 .74	47.0		100	11111	
			- DA	MPLE	F M	T CO				
Stabilisation Crit vithin ranges)	aria (3 readings	N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

FINE, SLIGHT SOUTHERLY BREEZE

,0	Has water quality meter and turbidity meter been calibrated in accordance with operating manual and recorded? Yes Decontamination procedures followed? Yes

Observations during Sampling:-	Samples Taken	Number	Duplicte: QA	Triplicate: QA	Order
eg. Odours, sheens, turbidity, water colour	Metals Plastic*				
DIRTY, TAHNIN COLOURED, ODOUROUS					
	Plastic unpreserved inorganics (1L)				
OTOMONIC O	Preserved inorganics (250mL)				
U DOURUUJ	Glass vials (40mL)				
	Glass amber unpreserved (500mL)				
	Plastic nutrients 60mL green/white				
	Plastic unpreserved inorganics (500mL)				
	Plastic nutrients 60mL light green				
	Glass amber unpreserved (100mL)				
	Plastic unpreserved inorganics (250mL)				
	(* DESIGNATES SAMPLES FILTERED IN FIE	LD)			Sector Participation

MONITORING WELL VOLUMES:-			
Diameter of well casing:	mm		
Diameter of hole drilled:	mm		
(1) Volume of casing only	0.000000 m3 (kL)	0.00 L per metre	
(2) Volume of drill-hole	0.000000 m3 (kL)	0.00 L per metre	
(3) Volume of annulus around casing	0.000000 m3 (kL)	0.00 L per metre	
(4) Total Bore Volume = 0.3*(3) + (1)	0.000000 m3 (kL)	0.0 L /m	
(assuming 30% porosity in sand/gravel paci-	k)		

Field Technician #1

Field Technician #2

GREENCAP

# GREENCAP

oject: cation:	Trility Groundwater bor Agnes Water, Qlo	e Installation and sa I	mpling		Consoled but	1-4-20	al information	AS		
cation	WELL DETAILS			SAMPLING EQU	IPMENT					
	Well depth:				Sampling device. Peristaltic (low flow) GEO# / PAO+ Water meter YSI# / PAO+ Turbidity Meter TM#					
STP1										
JIPT					e:		IP#			
Amount pu	and the second se	Water Level	Temperature	DO	Sp. Conductivity	Salinity	pH Units	ORP mV	Turbidity NTU	
Time (L)	purged (L)	(m) 0.005	24.2	% sat	us/cm 3801	PSU	6.66	7.2	ATO	
0936 2	6	2017	24.2	1	3764		6.64	2.8		
0940 2	T	2:575	242	0.54	7.4.3 2.3.2 2.4.12		6.70	-6.7		
0944 2	6	2.468	24.6	0.65	THE REPORT OF A	_	6.70	-9.9	_	
0948 2	8	2.448	24-1	0.66	3727		270	100		
0952 2	10	2.468	24-1	0.68	3680		970			
0956 2	12	2.484	24.2	0.70	3716	_	0.11	-15.4	_	
1000 2	14	2.495	241	0-71	3720		6-72	-19/1	_	
1004- 2	16	2.505	24-1	0.72	3716		6.72	-17.4	_	
1008 2	18	2.512	241	0.72	3729		6.71	-16-7	_	
			SAMPL	ES TA	KEY C				_	
					C					
					1.5					
						2				
					V O	0		1		
tabilisation Criteria (3reading	8	Drawdown								
thin ranges) eld observations: eg. Nearby	activities, weather	<10cm	± 10%	110%	± 5%	±10%	±0.1	± 10mv	N/A	
ithin ranges) eld observations: eg. Nearby	N/A	<10cm		±10%	± 5%	± 10%	±0.1	±10mv	N/A	
ithin ranges) ield observations: eg. Nearby FINE	activities, weather	<10cm	Has water qualit Decontaminatio	ty meter and turble in procedures follo	fity meter been calibr	rated in accordanc	e with operating n	nanual and recorded	? Yes	
Athin ranges) ield observations: eg. Nearby FINE J Deservations during Sampli rg. Odours, sheens, turbidity	n/A activities, weather NO WIMS ng:- ,, water colour	SUMA	17 Has water qualit	ty meter and turbic in procedures follo	fity meter been calibr				? Yes	
vithin ranges) ield observations: eg. Nearby FINE J Dbservations during Sampli eg. Odours, sheens, turbidit	n/A activities, weather NO WIMS ng:- ,, water colour	SUMA	Has water qualit Decontaminatio Samples Taker Metals Plastic	ty meter and turbin in procedures follo	dity meter been calibr wed? Yes	rated in accordanc	e with operating n	nanual and recorded	? Yes	
hthin ranges) ield observations: eg. Nearby FINE [ Diservations during Sampli	n/A activities, weather NO WIMS ng:- ,, water colour	SUMA	Has water qualit Decontaminatio Samples Taker Metals Plastic	ty meter and turbin in procedures follo n	dity meter been calibr wed? Yes	rated in accordanc	e with operating n	nanual and recorded	? Yes	
Athin ranges) ield observations: eg. Nearby FINE J Deservations during Sampli rg. Odours, sheens, turbidity	n/A activities, weather NO WIMS ng:- ,, water colour	SUMA	Has water qualit Decontaminatio Samples Taker Metals Plastic Plastic unpress Preserved inor Glass vials (400	ty meter and turbic in procedures follo n erved Inorganics rganics (250mL) mL)	dity meter been calibr wed? Yes (1L)	rated in accordanc	e with operating n	nanual and recorded	? Yes	
ithin ranges) ield observations: eg. Nearby FINE I Diservations during Sampli rg. Odours, sheens, turbidit	n/A activities, weather NO WIMS ng:- ,, water colour	SUMA	Has water qualit Decontaminatio Samples Taker Metals Plastic Plastic unpress Preserved inor Glass vials (400 Glass amber u	ty meter and turbic in procedures follo n erved Inorganics rganics (250mL) mL) npreserved (500i	dity meter been calibr wed? Yes (1L) mL)	rated in accordanc	e with operating n	nanual and recorded	? Yes	
Athin ranges) ield observations: eg. Nearby FINE J Deservations during Sampli rg. Odours, sheens, turbidity	n/A activities, weather NO WIMS ng:- ,, water colour	SUMA	Has water qualit Decontaminatio Samples Taker Metals Plastic Plastic unpress Preserved inor Glass vials (400 Glass amber u Plastic nutrien	ty meter and turbic in procedures follo n ; ganics (250mL) mL) npreserved (500n trs 60mL green/w	fity meter been calibr wed? Yes (1L) mL) thite	rated in accordanc	e with operating n	nanual and recorded	? Yes	
vithin ranges) ield observations: eg. Nearby FINE J Dbservations during Sampli eg. Odours, sheens, turbidit	n/A activities, weather NO WIMS ng:- ,, water colour	SUMA	Has water qualit Decontaminatio Samples Taken Metals Plastic Plastic unpress Preserved inor Glass vials (400 Glass amber u Plastic nutrien Plastic unpress Plastic nutrien	ty meter and turbio in procedures follo merved Inorganics rganics (250mL) mL) npreserved (500m ts 60mL green/w erved inorganics ts 60mL light gree	fity meter been calibr wed? Yes (1L) mL) hite (500mL) en	rated in accordanc	e with operating n	nanual and recorded		
Athin ranges) ield observations: eg. Nearby FINE J Deservations during Sampli rg. Odours, sheens, turbidity	n/A activities, weather NO WIMS ng:- ,, water colour	SUMA	Has water qualit Decontaminatio Samples Taken Metals Plastic Plastic unpress Preserved inor Glass vials (400 Glass amber u Plastic nutrien Plastic nutrien Plastic nutrien Glass amber u	ty meter and turbin in procedures follo n erved Inorganics rganics (250mL) mL) npreserved (500m ts 60mL green/w erved inorganics ts 60mL light gre npreserved (100	dity meter been calibr wed? Yes (1L) hite (SOOmL) en mL)	rated in accordanc	e with operating n	nanual and recorded	? Yes	
vithin ranges) ield observations: eg. Nearby FINE J Dbservations during Sampli eg. Odours, sheens, turbidit	n/A activities, weather NO WIMS ng:- ,, water colour	SUMA	Has water qualit Decontaminatio Samples Taken Metals Plastic Plastic unpress Preserved inor Glass vials (400 Glass amber u Plastic nutrien Plastic nutrien Glass amber u Plastic nutrien Glass amber u Plastic nutrien	ty meter and turbio in procedures follo merved Inorganics rganics (250mL) mL) npreserved (500m ts 60mL green/w erved inorganics ts 60mL light gree	fity meter been calibr wed? Yes (1L) /hite (500mL) en mL) (250mL)	rated in accordanc	e with operating n	nanual and recorded	? Yes	
vithin ranges) ield observations: eg. Nearby FINE Observations during Sampli eg. Odours, sheens, turbidit CLEAR, X	ng:- , water colour	SUMA	Has water qualit Decontaminatio Samples Taken Metals Plastic Plastic unpress Preserved inor Glass vials (400 Glass amber u Plastic nutrien Plastic nutrien Glass amber u Plastic nutrien Glass amber u Plastic nutrien	ty meter and turbio in procedures follo reved Inorganics rganics (250mL) mL) npreserved (500m ts 60mL green/w erved inorganics ts 60mL light gre npreserved (1000 erved Inorganics	fity meter been calibr wed? Yes (1L) /hite (500mL) en mL) (250mL)	rated in accordanc	e with operating n	nanual and recorded	? Yes	
vithin ranges) ield observations: eg. Nearby FINE J Observations during Sampli eg. Odours, sheens, turbidit	ng:- , water colour	SUMA	Has water qualit Decontaminatio Samples Taker Metals Plastic Plastic unpress Preserved inor Glass amber u Plastic nutrien Plastic unpress Plastic nutrien Glass amber u Plastic unpress (* DESIGNATE	ty meter and turbio in procedures follo reved Inorganics rganics (250mL) mL) npreserved (500m ts 60mL green/w erved inorganics ts 60mL light gre npreserved (1000 erved Inorganics	fity meter been calibr wed? Yes (1L) /hite (500mL) en mL) (250mL)	rated in accordanc	e with operating n	nanual and recorded	? Yes	
NUMNITORING WELL VOLUP Diameter of hole drilled:	ng:- , water colour	CIDem CISCHA	Has water qualit Decontaminatio Samples Taken Metals Plastic Preserved inor Glass vials (40) Glass amber u Plastic nutrien Glass amber u Plastic nutrien Gla	ty meter and turbin in procedures follo in procedures follo in served Inorganics (250mL) mtJ npreserved (500i ts 60mL green/w erved inorganics ts 60mL light gre npreserved (100i erved Inorganics S SAMPLES FILTE	fity meter been calibr wed? Yes (1L) (1L) mL) /hite (500mL) en mL) (250mL) RED IN FIELD)	rated in accordanc	e with operating n	nanual and recorded	? Yes	
Vithin ranges) ield observations: eg. Nearby FINE Doservations during Sampli eg. Odours, sheens, turbidit CLEAR, & MONITORING WELL VOLUD Diameter of well casing:	ng:- , water colour	<10cm	Has water qualit Decontaminatio Samples Taker Metals Plastic Plastic unpress Preserved inor Glass amber u Plastic nutrien Plastic unpress Plastic nutrien Glass amber u Plastic unpress (* DESIGNATE	ty meter and turbio in procedures follo rearved Inorganics reganics (250mL) mL) npreserved (500m ts 60mL green/w erved inorganics ts 60mL light gre npreserved (1000 erved Inorganics \$ SAMPLES FILTE	fity meter been calibr wed? Yes (1L) /hite (500mL) en mL) (250mL)	rated in accordanc	e with operating n	nanual and recorded	? Yes	

Field Technician #1

# GREENCAP

Client:	Trility	28				Job No:	ch4p4( 6) Per	sonal informa	tio	
roject:		re Installation and	f sampling			Sampled by:		-2020		
ocation:	Agnes Water, Qlo	d				Date:	21-4-	-2020	-	-
		WELL DETAILS			SAMPLING EQUI	PMENT		1		
		Well diameter: 50 mm Casing type: 900			Sampling device. Peristaltic (low flow)     GEO#       Water meter     YSI#       Turbidity Meter     TM#       Interphase probe:     IP#					
STP	2									
-	-									
	Amount purged	Cumulative	Water Level	Temperature	DO	Sp. Conductivity	Salinity	pH	ORP	Turbidity
Time	(L)	purged (L)	(m)	*C	% sat	μ\$/cm	PSU	Units	mV	NTU
1051	2	2	4.512	241	0.62	11903.		6.55	92.5	
1055	2	LL LL	4.560	24.0	1.07	11786	1	6.54	89.7.	
	0	1	1100	The second se	1.07			Loi.	85.6	
1059	12	6	7.565	240		11749		0.54		
1105	2	8	4.565	24-0	1.09	11656		6.53	86.3	_
1109	2	102	4565	24.0	1.10	11778		6.53	8.3	
1114	2	12	Inche	240	1017	11640		6.53	85.9	
		16	4.905		1.16	L'alla		6.53		-
118	2	14	4.565	24.0	1.13	11732		6.53	85.5	
			SAM	RES 7	AKEL	1				
							5			
_				_			0			
	1					C?				
abilication Crite	nia (Broadings		Drawdown			ľ d				
ithin ranges) eld observations	s: eg. Nearby activi		Drawdown <10cm	±10%	± 10%	25%	± 10%	±0.1	±10mv	N/A
ithin ranges) eld observations	s: eg. Nearby activi	ties, weather			10%	1 5%	± 10%	±0.1	± 10mv	N/A
ithin ranges) eld observations	s: eg. Nearby activi	ties, weather	<10cm	Has water quality	meter and turbidit	y meter been calibr		2004 k	± 10mv	
ithin ranges) eld observation: F	s: eg. Nearby activi	ties, weather	<10cm	Has water quality Decontamination		y meter been calibr	ated in accordance	with operating ma		
ithin ranges) eld observations F	s: eg. Nearby activi	0 WIM	<10cm	Has water quality	meter and turbidit	y meter been calibr		2004 k	anual and recorded	Yes
ithin ranges) eld observations F bservations du g. Odours, shee	ring Sampling:- ns, turbidity, wate	0 W/W	<10cm	Has water quality Decontamination Samples Taken	meter and turbidit	y meter been calibr	ated in accordance	with operating ma	anual and recorded	Yes
ithin ranges) eld observations F bservations du g. Odours, shee	ring Sampling:-	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic*	meter and turbidit	y meter been calibr ed? Yes	ated in accordance	with operating ma	anual and recorded	Yes
ithin ranges) eld observations F bservations du g. Odours, shee	ring Sampling:- ns, turbidity, wate	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg.	meter and turbidit procedures follow ved Inorganics (1 anics (250mL)	y meter been calibr ed? Yes	ated in accordance	with operating ma	anual and recorded	Yes
ithin ranges) eld observations F bservations du g. Odours, shee	ring Sampling:- ns, turbidity, wate	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg; Glass vials (40m	meter and turbidit procedures follow ved Inorganics (1 anics (250mL) L)	y meter been calibr ed? Yes L}	ated in accordance	with operating ma	anual and recorded	Yes
ithin ranges) eld observations F bservations du g. Odours, shee	ring Sampling:- ns, turbidity, wate	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg; Glass vials (40m Glass amber unp	meter and turbidit procedures follow ved Inorganics (1 anics (250mL) L) preserved (500m)	y meter been calibr ed? Yes L)	ated in accordance	with operating ma	anual and recorded	Yes
ithin ranges) eld observations F bservations du g. Odours, shee	ring Sampling:- ns, turbidity, wate	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg; Glass vials (40m Glass amber unp Plastic nutrients	meter and turbidit procedures follow ved Inorganics (1 anics (250mL) L)	y meter been calibr ed? Yes L) L) te	ated in accordance	with operating ma	anual and recorded	Yes
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ithin ranges) eld observations F bservations du g. Odours, shee	ring Sampling:- ns, turbidity, wate	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg. Glass vials (40mi Glass amber unp Plastic nutrients Plastic nutrients Plastic nutrients Glass amber unp	meter and turbidit procedures follow ved Inorganics (1 anics (250mL) L) preserved (500m, 60mL green/whi ved inorganics (5 60mL light green preserved (100m)	y meter been calibr ed? Yes L) L) te 00mL) h	ated in accordance	with operating ma	anual and recorded	Yes
ithin ranges) eld observations F bservations du g. Odours, shee	ring Sampling:- ns, turbidity, wate	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Plastic nutrients Plastic nutrients Plastic nutrients Plastic nutrients Glass amber unp Plastic nutrients Glass amber unp Plastic nutrients	meter and turbidit procedures follow ved Inorganics (1 anics (250mL) L) preserved (500m, 60mL green/whi ved inorganics (5 60mL light green preserved (100m) ved Inorganics (2	y meter been calibr ed? Yes L) L) te 00mL) h L) S0mL)	ated in accordance	with operating ma	anual and recorded	Yes
vithin ranges) ield observations F Deservations du g. Odours, shee	ring Sampling:- ns, turbidity, wate	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Plastic nutrients Plastic nutrients Plastic nutrients Plastic nutrients Glass amber unp Plastic nutrients Glass amber unp Plastic nutrients	meter and turbidit procedures follow ved Inorganics (1 anics (250mL) L) preserved (500m, 60mL green/whi ved inorganics (5 60mL light green preserved (100m)	y meter been calibr ed? Yes L) L) te 00mL) h L) S0mL)	ated in accordance	with operating ma	anual and recorded	Yes
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ADDESERVATIONS OF THE PARTY OF	ring Sampling:- ins, turbidity, wate $R_1 NO$ rell VOLUMES:- I casing:	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg; Glass vials (40m Glass amber unp Plastic nutrients Plastic unpreser Plastic unpreser Plastic unpreser (* DESIGNATES S	meter and turbidit procedures follow ved Inorganics (1 anics (250mL) L) preserved (500m, 60mL green/whi ved inorganics (5 60mL light green preserved (100m) ved Inorganics (2	y meter been calibr ed? Yes L) L) te 00mL) h L) S0mL)	ated in accordance	with operating ma	anual and recorded	Yes
Anthin ranges) ield observations ield observations observations du g. Odours, shee CUCA MONITORING W Diameter of well Diameter of hole	ring Sampling:- ns, turbidity, wate $\mathcal{A}_{1}$ NO ( rell VOLUMES:- I casing: a drilled:	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg; Glass vials (40m Glass amber unp Plastic nutrients Plastic nutrients Glass amber unp Plastic nutrients Glass amber unp Plastic unpreser (* DESIGNATES S	meter and turbidit procedures follow ved inorganics (1 anics (250mL) L) areserved (500mL) 60mL green/whi ved inorganics (5 60mL light green preserved (100m ved inorganics (2 SAMPLES FILTERE	y meter been calibr ed? Yes L) L) te 00mL) b L) S0mL) D IN FIELD)	ated in accordance	with operating ma	anual and recorded	Yes
VICHIN ranges) ield observations ield observations observations du g, Odours, shee CUCA MONITORING W Diameter of well Diameter of hole 1) Volume of ca	ring Sampling:- ns, turbidity, wate $\mathcal{R}_{1}$ NO rell VOLUMES:- I casing: a drilled: sing only	0 W/W	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Preserved inorg Glass vials (40m Glass amber unp Plastic nutrients Glass amber unp Plastic nutrients Glass amber unp Plastic nutrients Glass amber unp Plastic unpreser (* DESIGNATES S mm mm mm m3 (kL)	meter and turbidit procedures follow ved Inorganics (1 anics (250mL) L) oreserved (500mL) 60mL green/whi ved Inorganics (5 60mL light green preserved (100m ved Inorganics (2 SAMPLES FILTERE	y meter been calibr ed? Yes L) L) te 00mL) h L) S0mL)	ated in accordance	with operating ma	anual and recorded	Yes
Deservations du g. Odours, shee CUCA MONITORING W Diameter of hole 1) Volume of ca 2) Volume of ar 3) Volume of ar	ring Sampling:- ns, turbidity, wate $\mathcal{R}_{1}$ NO rell VOLUMES:- I casing: a drilled: sing only	ing	<10cm	Has water quality Decontamination Samples Taken Metals Plastic* Plastic unpreser Plastic nutrients Plastic nutrients Plastic nutrients Glass amber unp Plastic nutrients Glass amber unp Class a	meter and turbidit procedures follow ved Inorganics (1 anics (250mL) L) preserved (500m, 60mL green/whi ved inorganics (5 60mL light greer preserved (100m ved Inorganics (2 5AMPLES FILTERE 0. 0. 0. 0.	y meter been calibr ed? Yes L) L) te 00mL) D S0mL) D IN FIELD) 00 L per metre	ated in accordance	with operating ma	anual and recorded	Yes

Field Technician #1



DESAL

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### Groundwater Monitoring Standing Water Level Measurement

\*\*NB\*\* Measurement to be taken in mm from top of bore casin

Date	Time	Operator	Desal 1	Desal 2	Desal 3
1-9-2016	1300		2210	2440	2985
27.9.2016			2275	2500	2.992
18= 10-2016			.2324	2575	2845
15.11.20H	2:50pm		2440	2672	3142
14.12.2016			2405	2650	2995
19.1.2017	0745		2461	2698	13072
27.2.2017			2627	2860	3402
8.3.2017	0930		2650	2539	3642
18/4/2017			2051	2278	2953
19 5 2017	11:30m		2135	2372	
21-8-2017			2170		2460
20-7-201	and the second se	-	2240	2470	2980
27-8-2017		-			2998
29-9-201-		-	23/7	2627	3017
26/10/2017	13	-	2425	2718	3120
30/1/2017	3 pm		1825	2120	2054
14-12-17	830	-	- 2120	2344	8-89a
		- (	2065	2085	2862
21.1.18	1:10pm		2065	2280	2950
27.2.18	8-30 A.M		1522	1788	2745
23.3.18	9.00 A.M		1607	1830	2846
27-4-18	3.30pm		1834	2023	2875
13-5-15	\$15		1912	2123	2896
4-6-18	9.00 0.M		1930	2150	2912
6-7-18	9.10 a.m.	p4( 6) Personal information	2030	2023	2083
03-3-18	11.100.m		2210	2441	3001
19-9-18	9-00 mm		2296	2498	3058
8-10-18	Suz AM		2350	2572	3072
29-11-18	13:06 pm		2370	2660	3175
18-12-18	Groopin		2765	2692	3016
31-1-19	16 00 pm		2475	2810	3390
28-2-19	10:40 Am		2587	2980	3535
25-3-19			2530	2882	
10-4-19	8.10 p.m		2530	1000	3375
27-5-19	1230pm		2547	2889	3401
27-5-19	9.00 Am		2380	2352	2010
31-7-2010	1 7.20 A.M		2478	2081 2786	8110
16.8.19	5.30 pm			0100	3181
16.9.19	Quit		2582 1	2632	3227
21-10-19	8:45 pm		2627	2949	3306
27.11.19	11:20 Am		2547	2851	3090
	14:15 p.m.	-	2760	3065 3140	3082
16-1249	4.00 000		2784	3140	2592
29-1-20			2943	3244	3652
26.2.20	2 12:30 pm		2104	2445	2779
15-4-20	2 0830		2243 2430	2523 2695 2735	2960
11-5-20	0830		2430	2695	3072
22-6-20	0950		2443	1725	3080

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