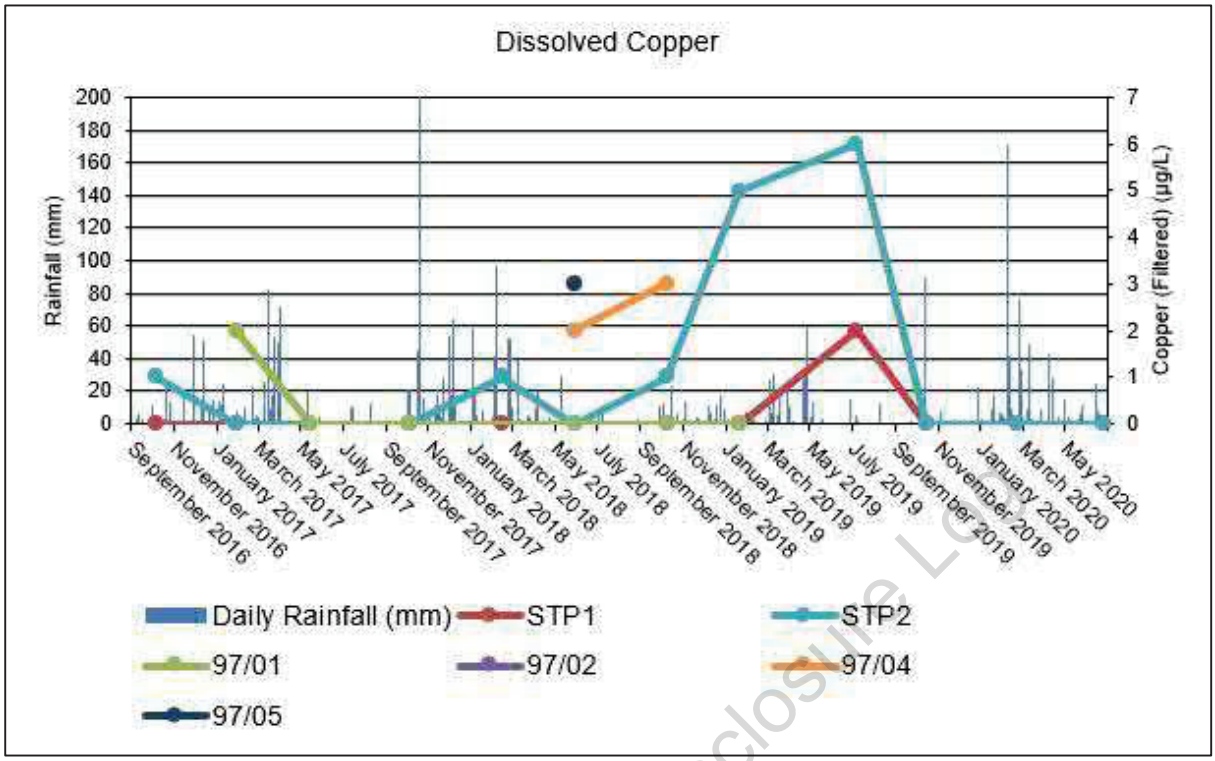

Figure 37 WwTP Dissolved Copper, September 2016 – June 2020

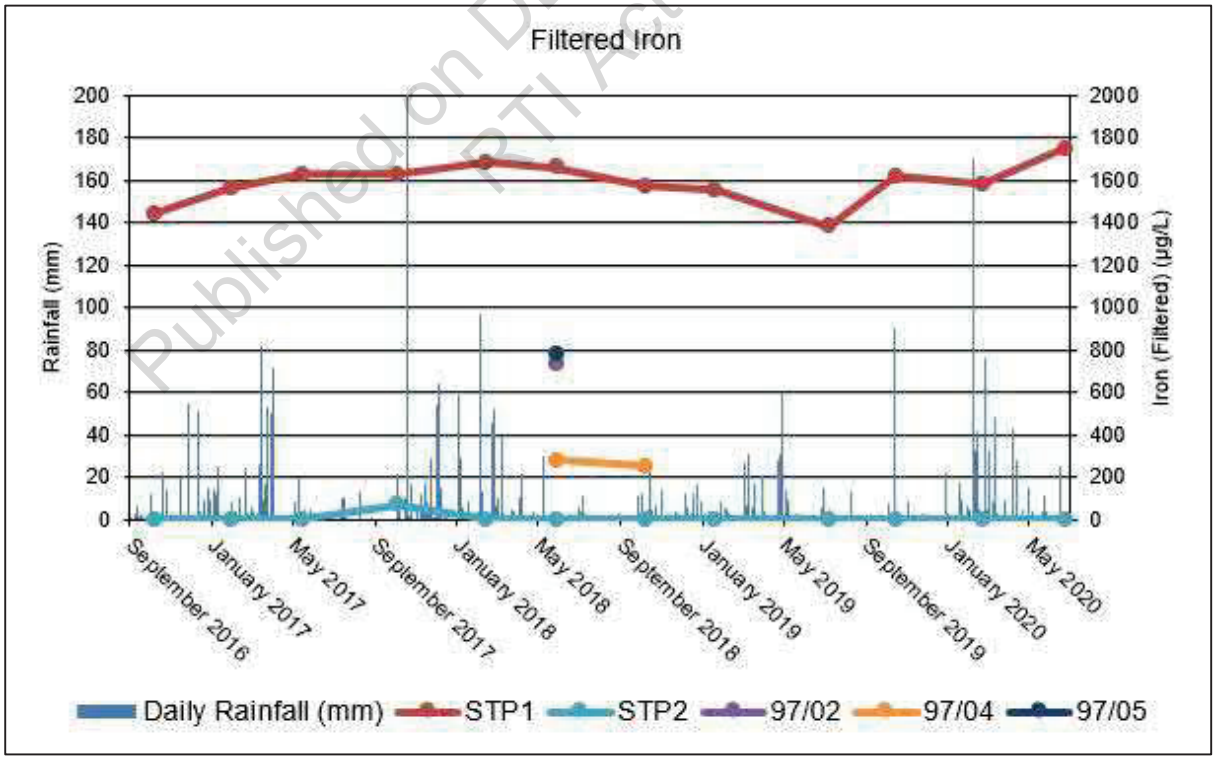

Figure 38 WwTP Filtered Iron, September 2016 – June 2020

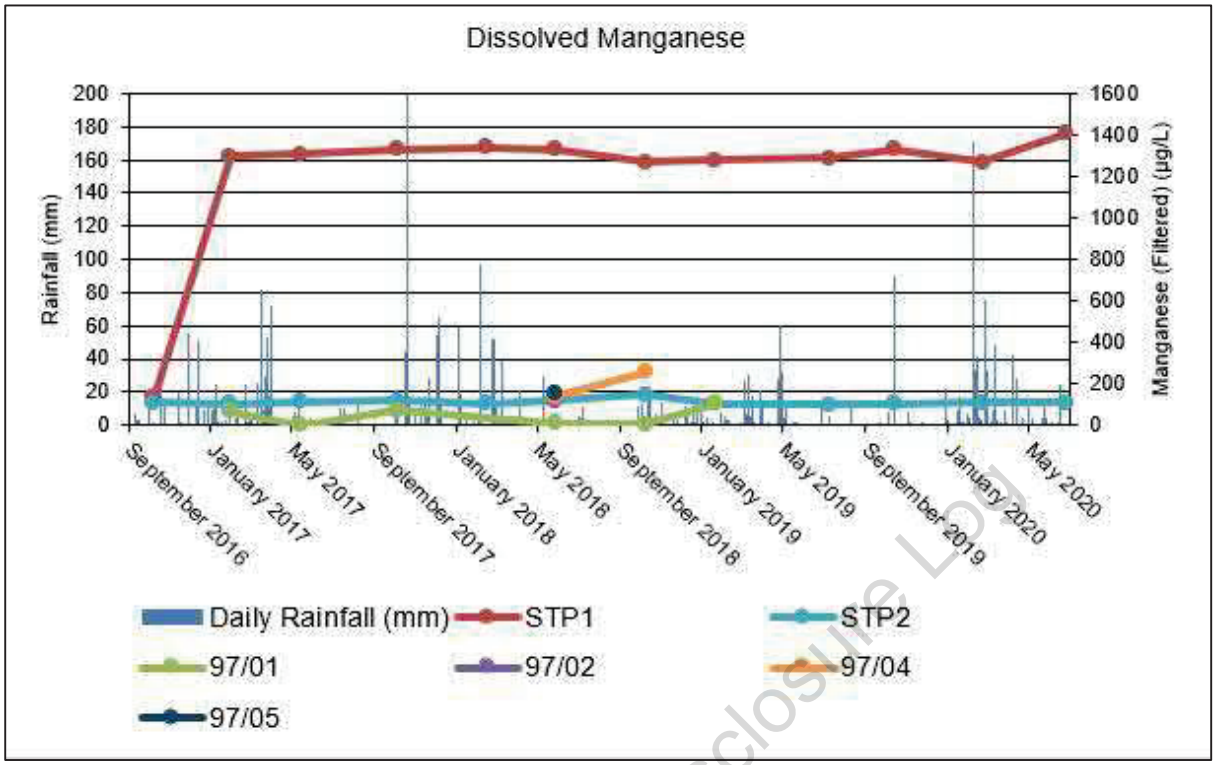

Figure 39 WwTP Dissolved Manganese, September 2016 – June 2020

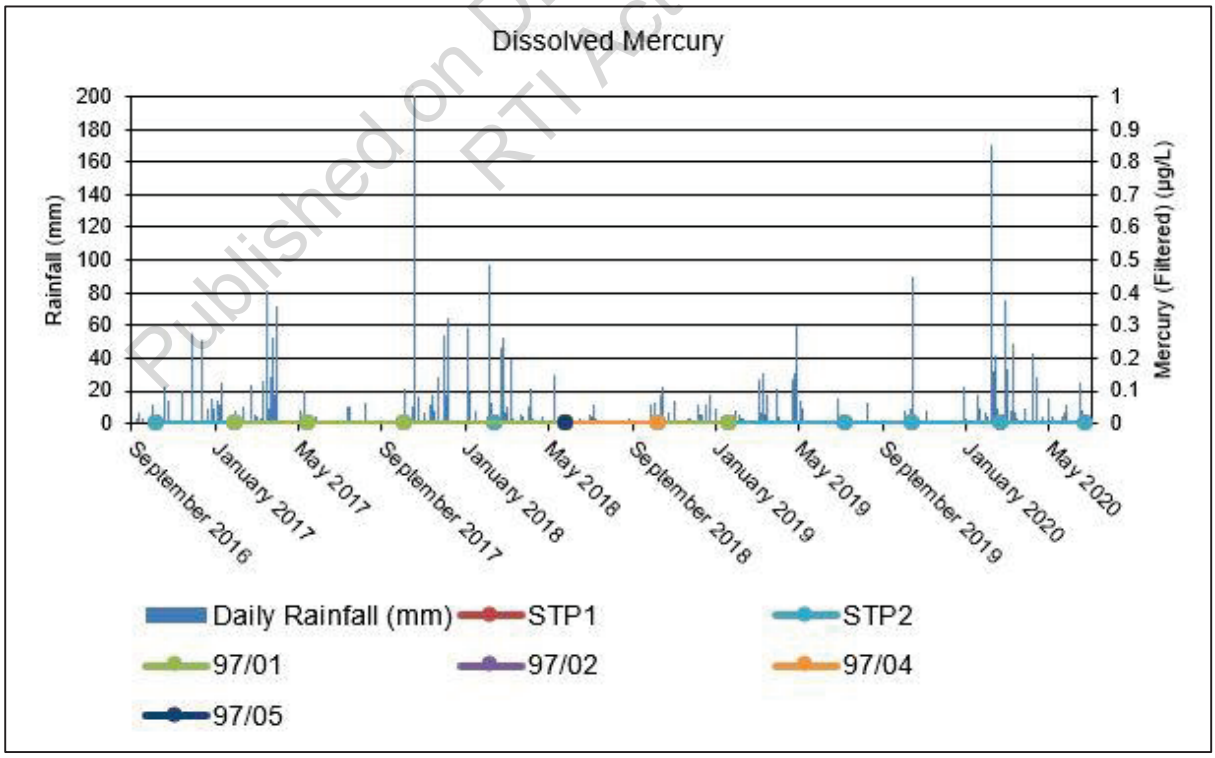

Figure 40 WwTP, Dissolved Mercury, September 2016 – June 2020

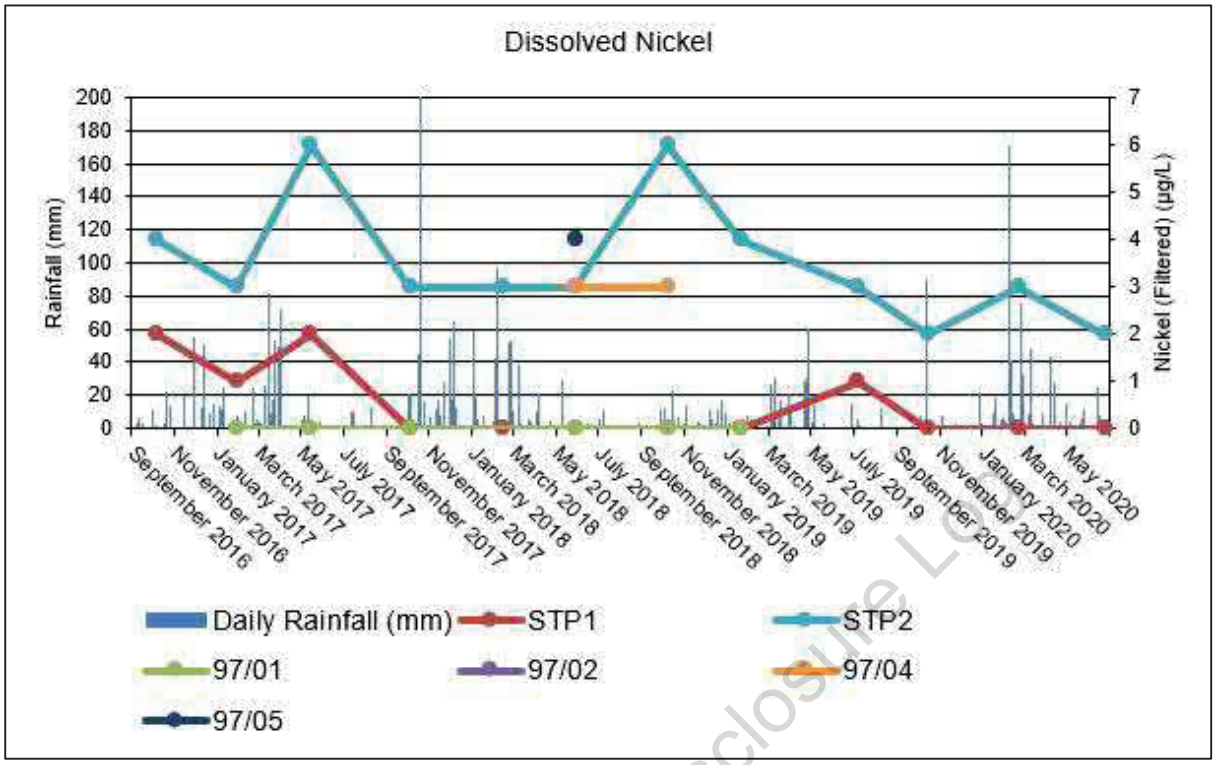

Figure 41 WwTP Dissolved Nickel, September 2016 – June 2020

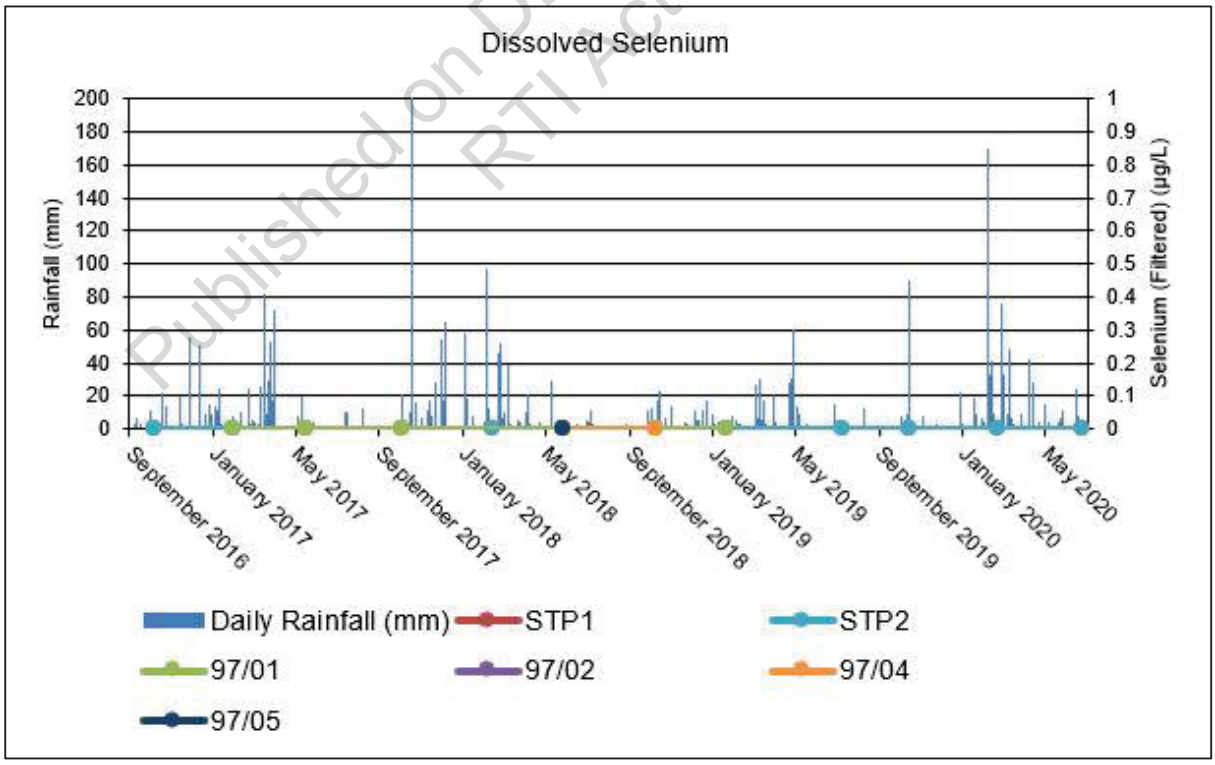

Figure 42 WwTP Dissolved Selenium, September 2016 – June 2020

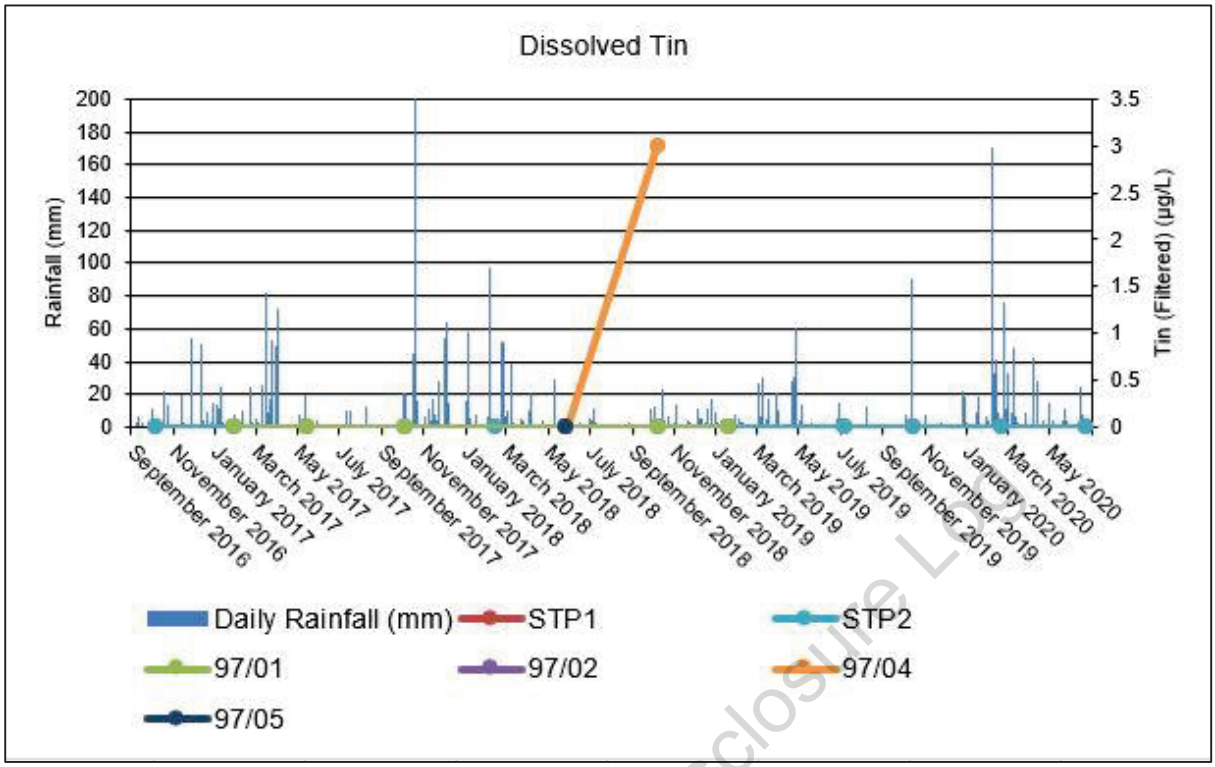

Figure 43 WwTP Dissolved Tin, September 2016 – June 2020

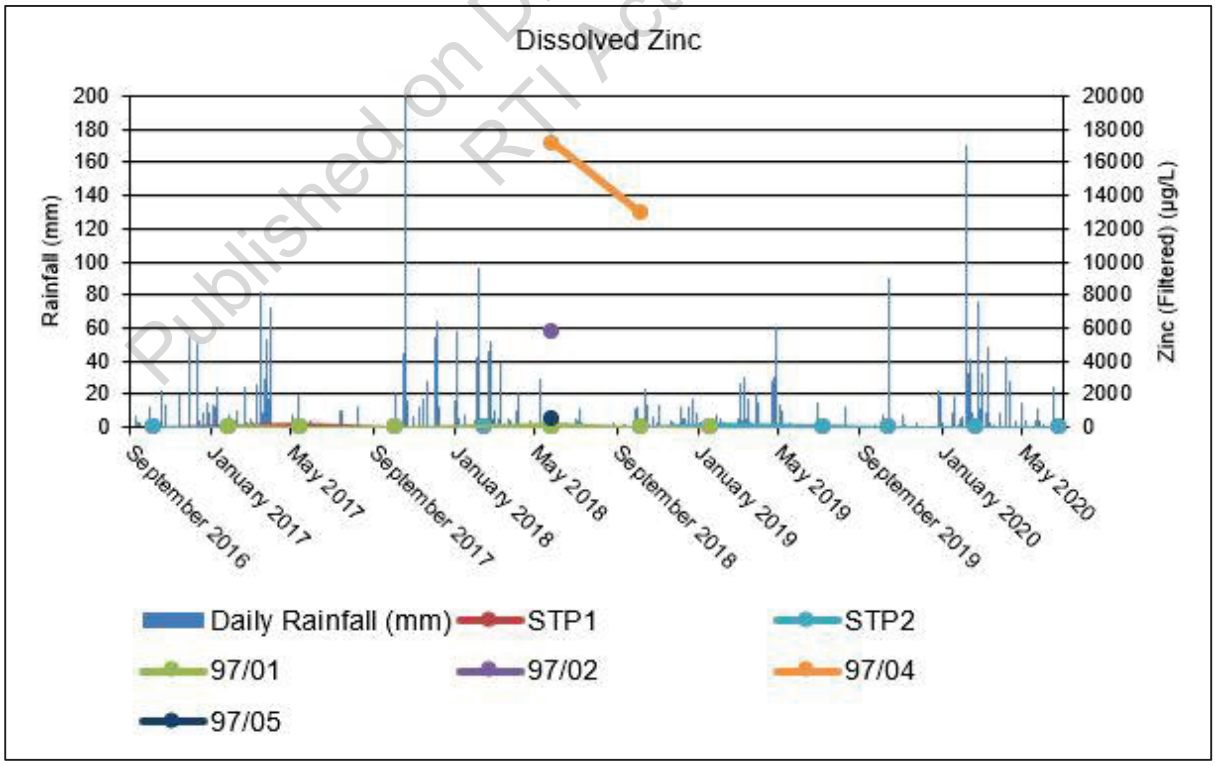

Figure 44 WwTP Dissolved Zinc, September 2016 – June 2020

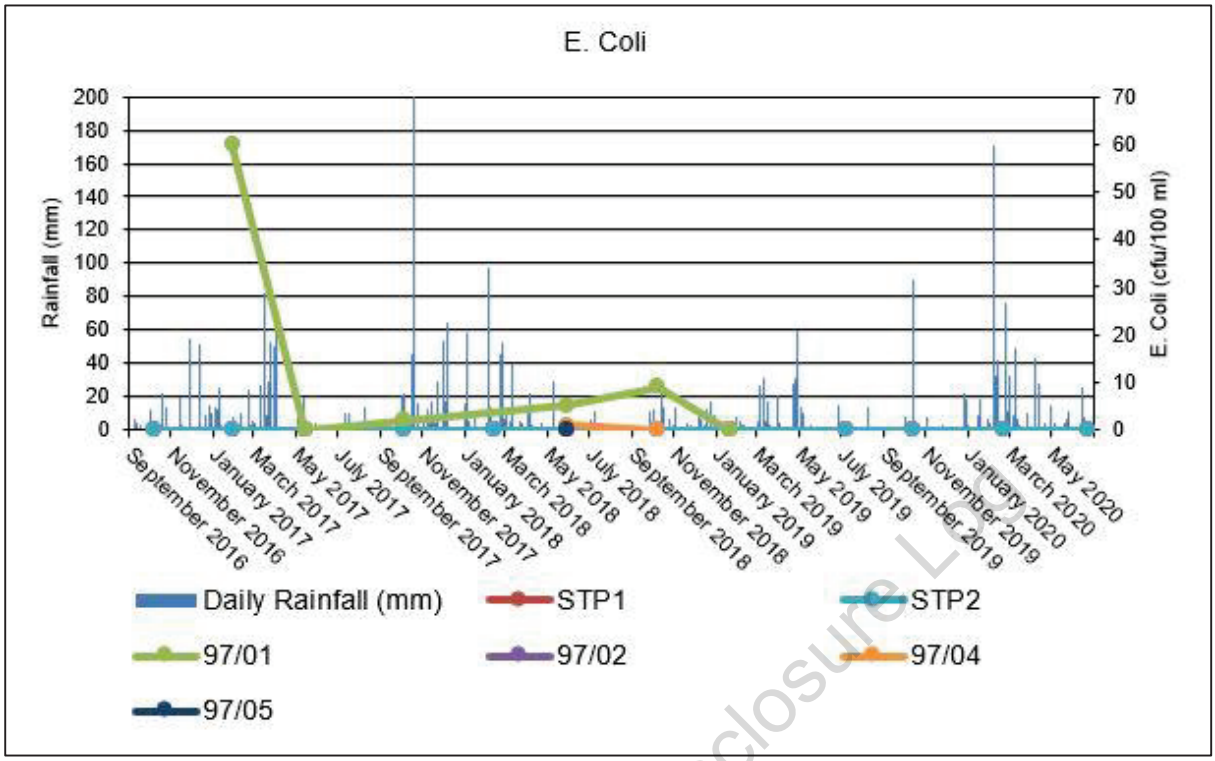

Figure 45 WwTP *E.Coli*, September 2016 – June 2020

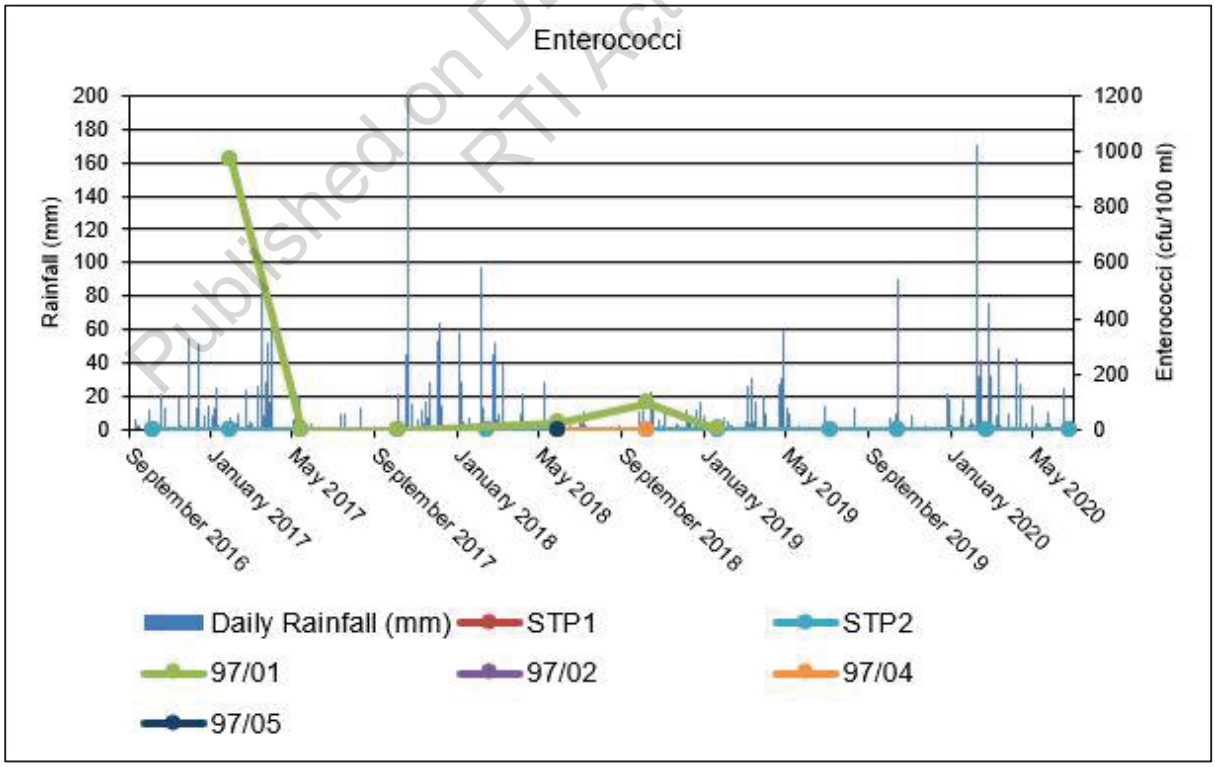

Figure 46 WwTP Enterococci, September 2016 – June 2020

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

C114943: AS

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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
TOC	Top of Casing
Trility	Trility Pty Ltd
µS/cm	microsiemens per centimetre
µg/L	mircograms per litre
WwTP	Wastewater Treatment Plant

APRIL 2021 QUARTERLY REPORT

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**).

Table 1-1 Location 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 WATERS - (Lot 52 Plan SP155903 and Lot 41 Plan SP 206868 (**Figure 2-1)**
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) (**Figure 2-2**)

* 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.

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.

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**).

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.

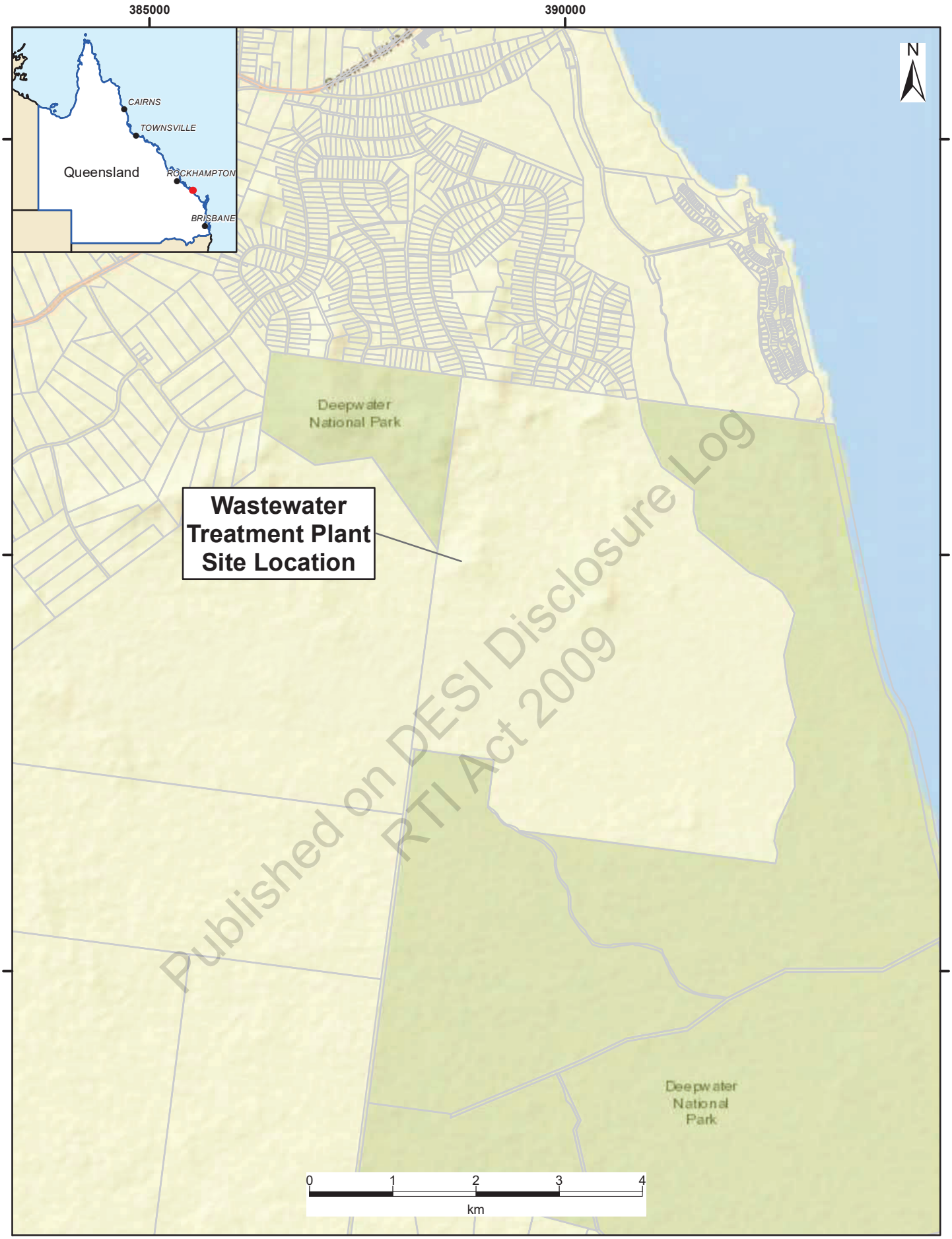
Lot Boundary

Sources: Esri, HERE, DeLorme, USGS, Intermap, increment P Corp., NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri (Thailand), MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Site Location of Integrated Water Treatment Plant	
Figure 2-1	**Trility Pty Ltd**
Date: *10/05/2018*	**Author:** hersona **Map Scale:** 1:8,000
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C114943_Trility Pty Ltd\GIS\Agnes Water\J143710-01_Sept_2017_QR\mxd\FIG_2_1_IWTP_site_location_171221.mxd



Lot Boundary

Site Location of Wastewater Treatment Plant

Figure 2-2	**Trility Pty Ltd**
Date: *10/05/2018*	**Author:** persona **Map Scale:** 1:60,000
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C114943_Trility Pty Ltd\GIS\Agnes Water\143710-01_Sept_2017_QR\mxd\FIG_2_2_WwTP_site_location_171221.mxd

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.**

Table 3-1 Integrated Water Treatment Plant Groundwater Monitoring Bores

Well Name	Easting	Northing	Depth of Well (mbGL)[1]	Relative Level (m)
DESAL1	390050.613	7320897.615	6.5	19.117
DESAL2	390045.732	7320949.351	6.0	19.555
DESAL3	390005.808	7320906.402	5.0	18.739

[1] 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)[1]	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

[1] metres below top of well casing

Lot Boundary
Groundwater Bore (Greencap May 2016)
Indicative Location of Treated Water Flush Point
Indicative Location of Brine Pipe
Indicative Location of Seawater Pipe

Location of IWTP Groundwater Bores

Figure 3-1

Trility Pty Ltd

Date: *9/07/2018*

Author: Personal

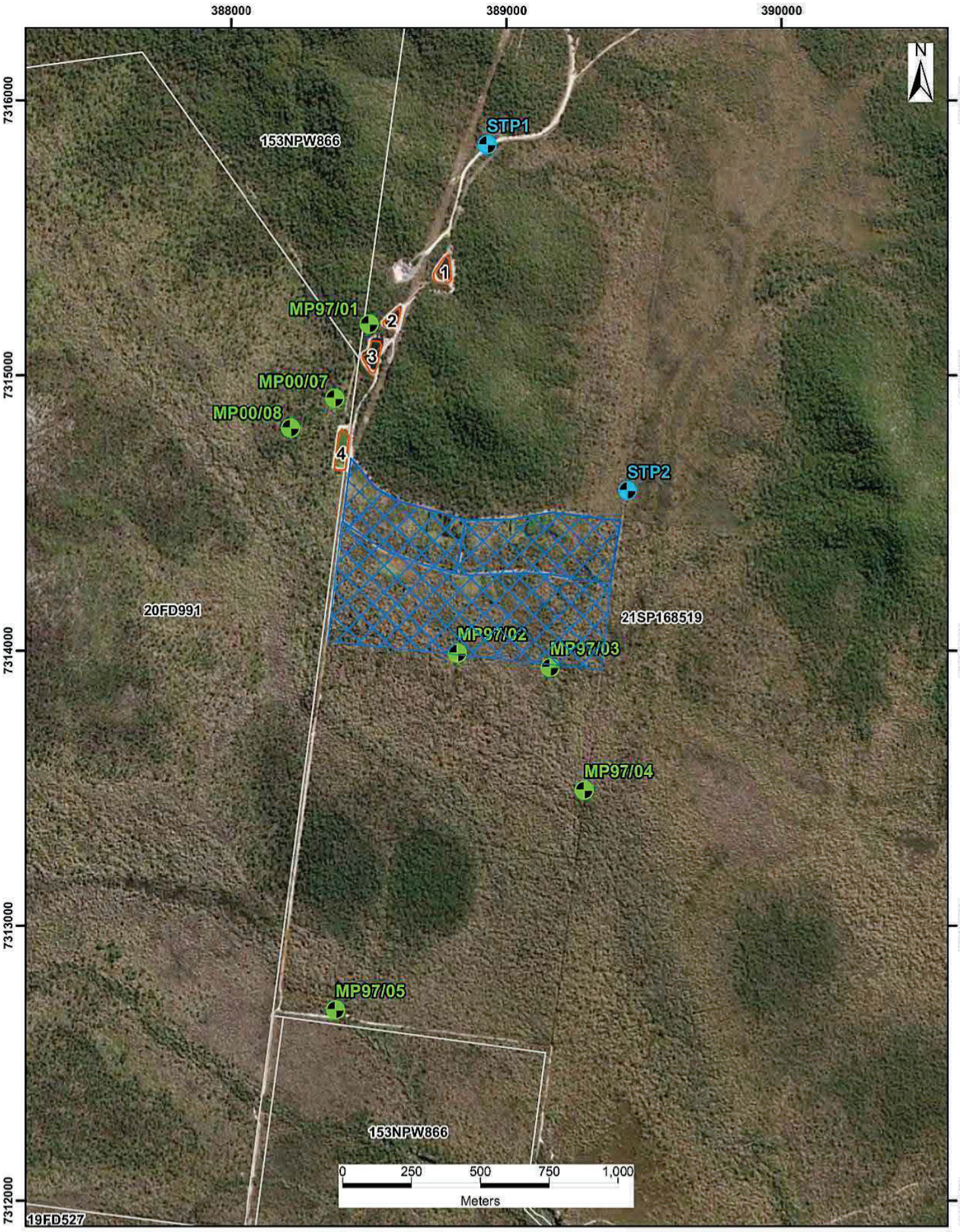
Map Scale: 1:1,200

Revision: R1

Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C114943_Trility Pty Ltd\GIS\Agnes Water\J143710-01-01-01_Mar_2018_QRmxd\FIG_3_1_IWTP_GW_bore_loc_180709.mxd



Lot Boundary
Lagoon
Recycled Water Irrigation Area

Groundwater Bore
Greencap (May 2016)
Previously Existing

Location of WwTP Groundwater Bores	
Figure 3-2	**Trility Pty Ltd**
Date: 6/08/2018	Author: Personal Map Scale: 1:18,000
Revision: R1	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C110943_Trility Pty Ltd\GIS\Agnes Water\Annual 2018\mxd\FIG_3_2_WwTP_GW_bore_loc_180806.mxd

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**.

Table 4-1 Monitoring Parameters and Trigger Values

Quality Characteristic	Units	Trigger Values
Dissolved Oxygen	mg/L	20% change from background[1]
Total Nitrogen	mg/L as Nitrogen	
Nitrate	mg/L as Nitrogen	
Ammonia	mg/L as Nitrogen	
Total Phosphorous	mg/L	
Chloride	mg/L	
Conductivity	uS/cm	
Sulphate	mg/L	No change from background[2]
Boron	mg/L	
pH	pH unit	
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 Guidelines
Dissolved Metals: (Al, Fe, Mn, As, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Sn, Zn).	mg/L or ug/L	

[1] 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.

5 SAMPLING METHODOLOGY

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 µm 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 RESULTS

Groundwater samples for the first quarter of 2021 were collected between the 19th and 22nd 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 Data, January - April 2021

Month	WwTP	IWTP
January 2021	67.1	60.1
February 2021	83	71.6
March 2021	350.3	293.8
April 2021	109.4	105
Total	609.8	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 Location	Relative Height Data (m AHD)	Depth to Groundwater from Top of Casing (m bTOC)[1]			Groundwater Elevation (m AHD)[2]		
		January 2021	February 2021	April 2021	January 2021	February 2021	April 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

Monitoring Location	Relative Height Data (m AHD)	Depth to Groundwater from Top of Casing (m bTOC)[1]			Groundwater Elevation (m AHD)[2]		
		January 2021	February 2021	April 2021	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

[1] m bTOC = metres below top of casing

[2] m AHD = metres Australian Height Datum

DRY = no standing water present

Table 6-3 Groundwater Field Description, April 2021

Monitoring Location	Colours	Odour	Turbidity
WwTP			
STP1	Clear	No odour	ND[1]
STP2	No colour	No odour	No visible turbidity
MP97/01	No colour	No odour	Turbid
MP97/02	No colour	ND[1]	Turbid
MP97/03	Colour	ND[1]	Turbid
MP97/04	ND[1]	ND[1]	Turbid
MP97/05	ND[1]	ND[1]	Turbid
MP00/07	No colour	ND[1]	Turbid
MP00/08	No colour	ND[1]	Turbid
IWTP			
DESAL1	Colour	Slight odour	Not turbid
DESAL2	Colour	No odour	Slightly turbid
DESAL3	Slight colour	Slight odour	ND[1]

[1] ND = no data

Lot Boundary

Groundwater Bore

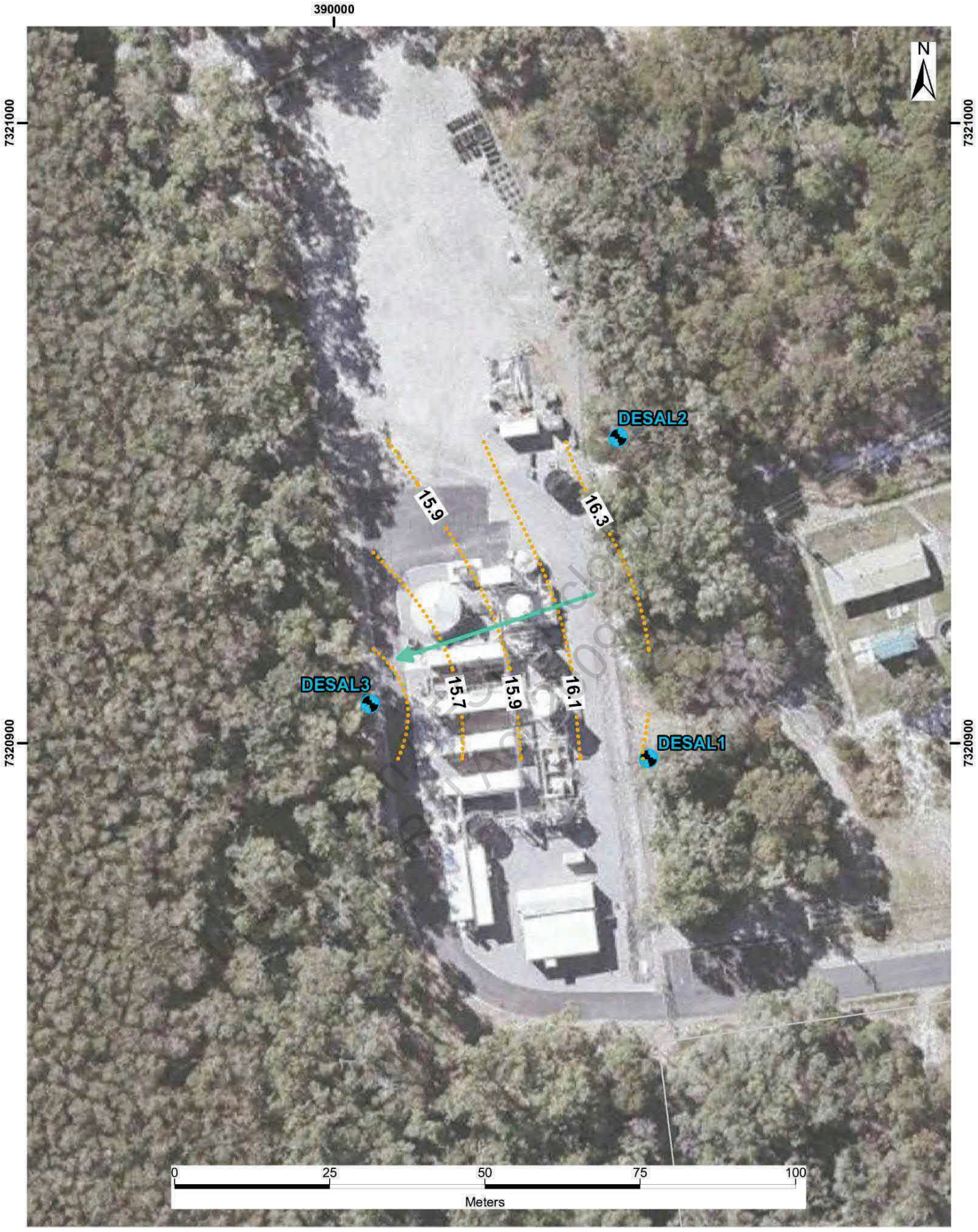
Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Groundwater Level Contours, January 2021	
Figure 6-1	**Trility Pty Ltd**
Date: 18/01/2021	Author: [redacted]
Revision: R1	Map Scale: 1:800 Coordinate System: GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Groundwater Level Contours, February 2021	
Figure 6-2	**Trility Pty Ltd**
Date: *18/01/2021*	**Author:** ersonal **Map Scale:** 1:800
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP

Lot Boundary

Groundwater Bore

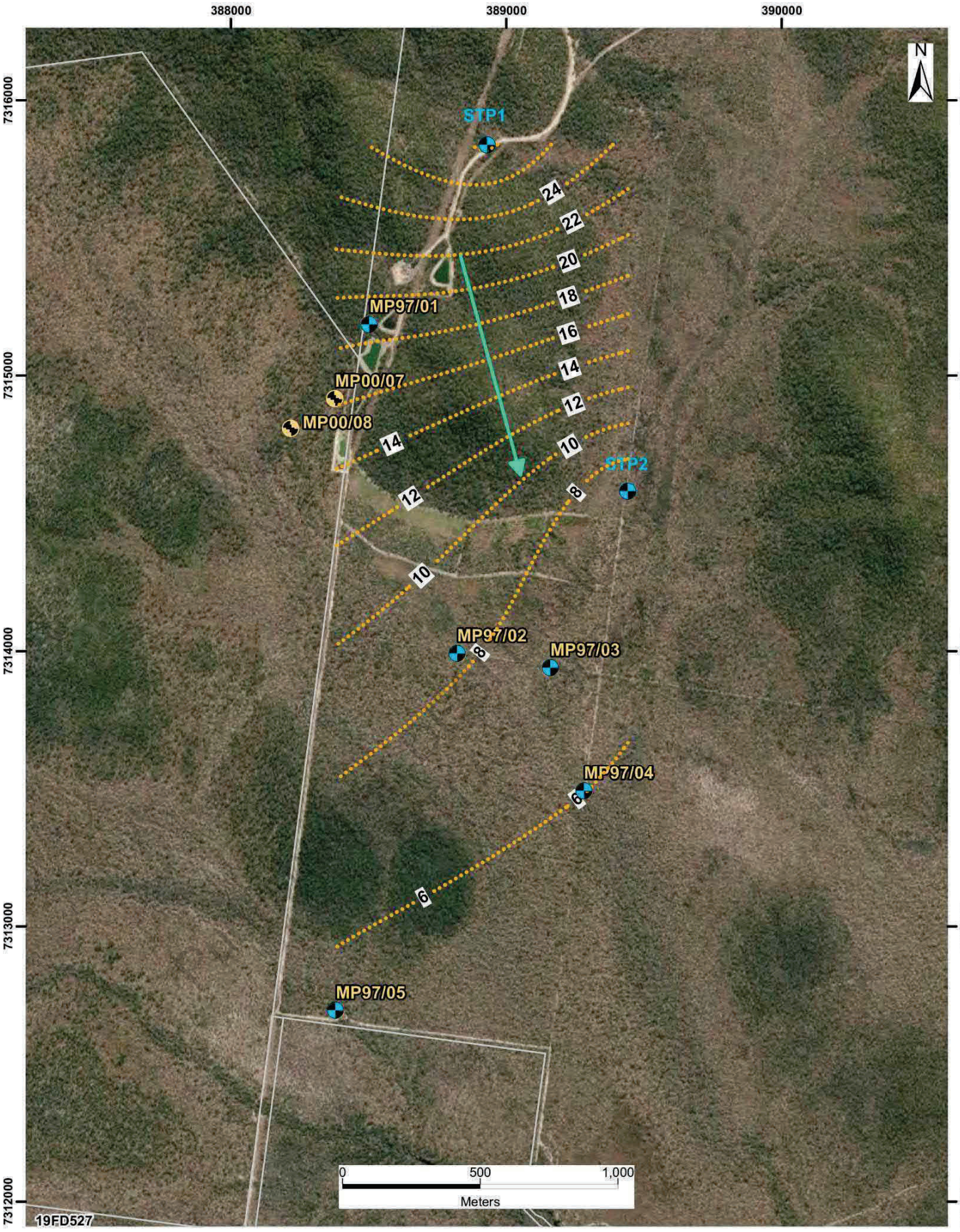
Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Groundwater Level Contours, April 2021	
Figure 6-3	**Trility Pty Ltd**
Date: *18/01/2021*	**Author:** [redacted]
Revision: R1	**Map Scale:** 1:800 **Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

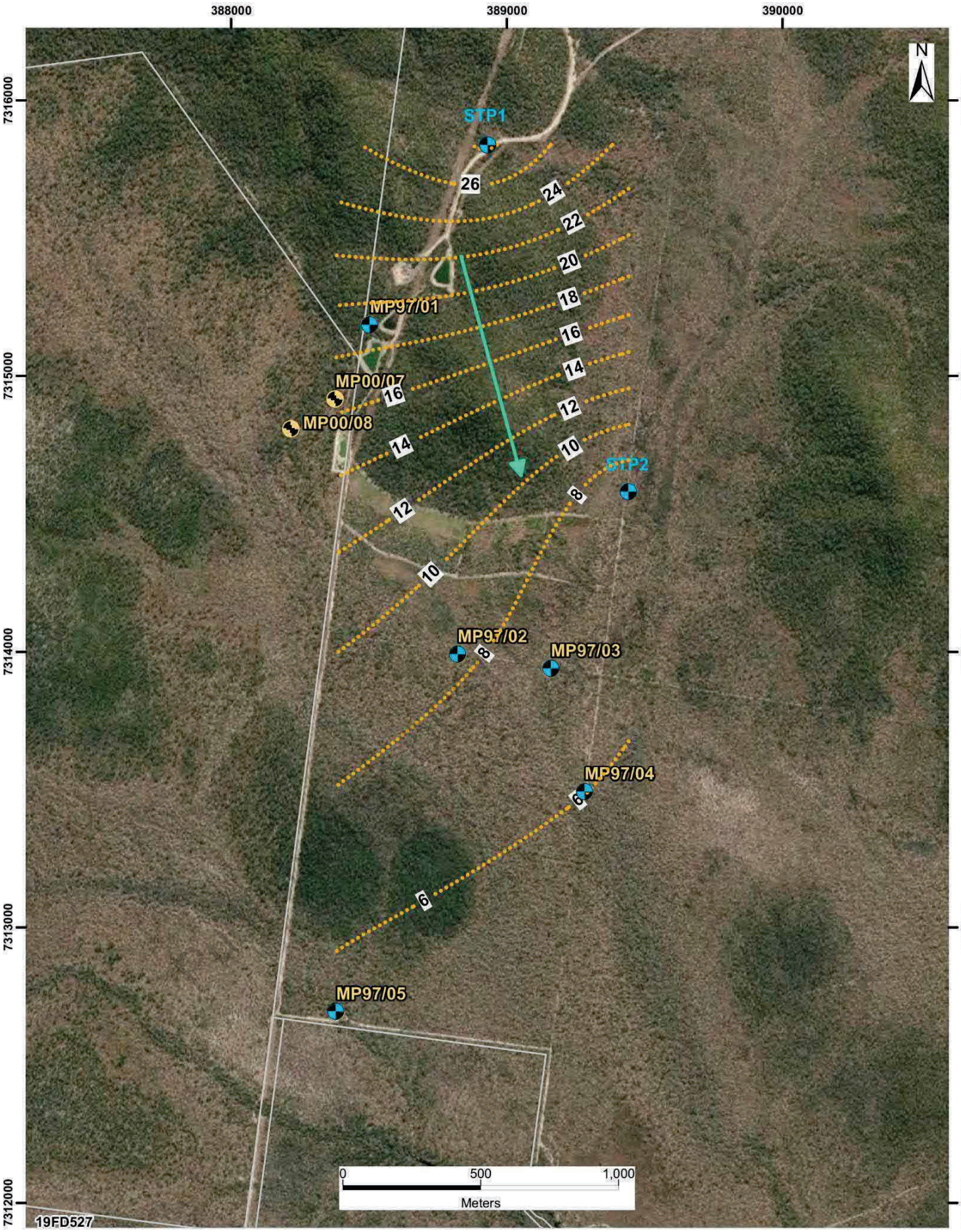
Groundwater Bore

Water Level Gauged

Dry

WwTP Inferred Groundwater Flow Direction, January 2021	
Figure 6-4	**Trility Pty Ltd**
Date: *18/01/2021*	**Author** [redacted]
Revision: R1	**Map Scale:** 1:18,000
	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

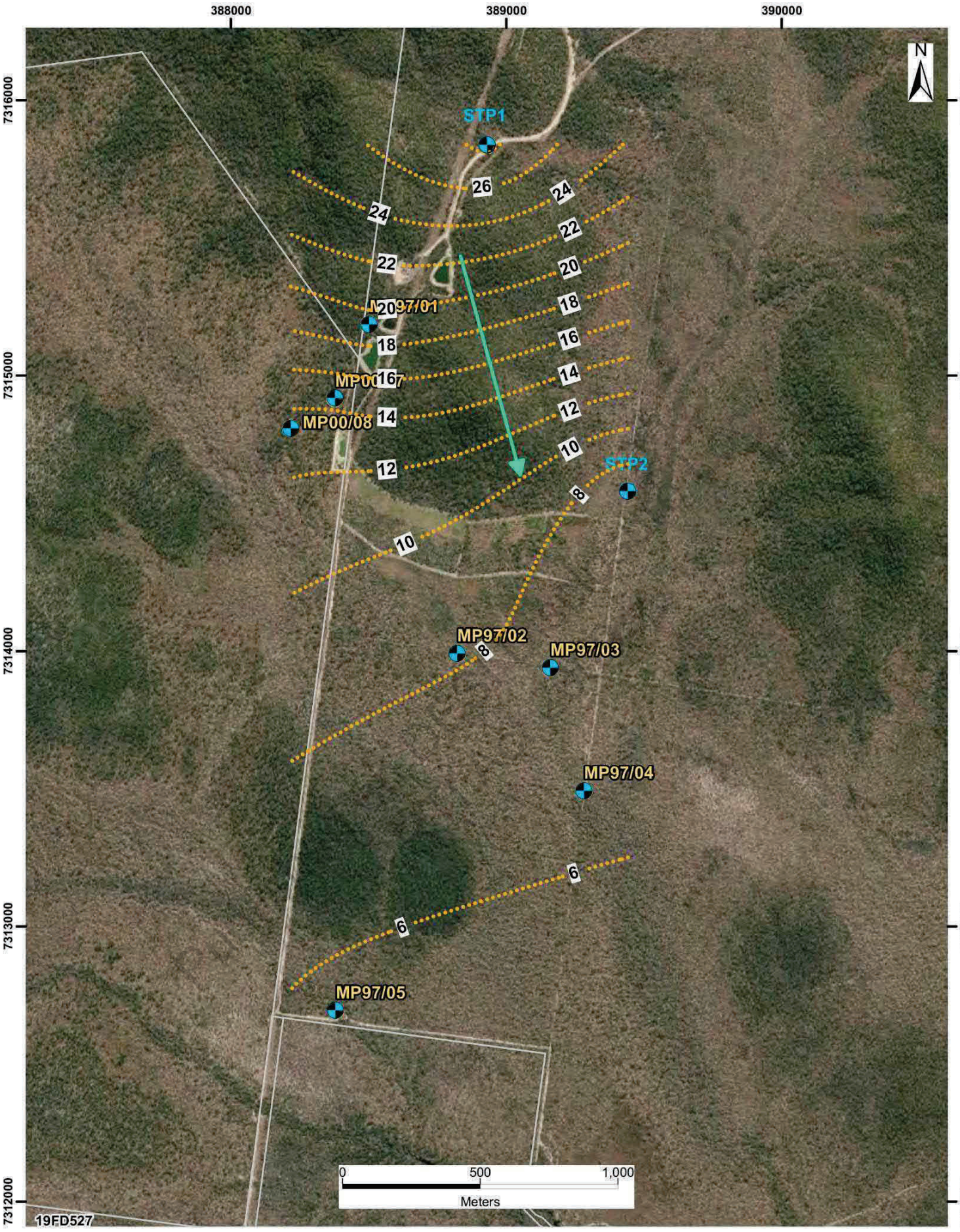
Groundwater Bore

Water Level Gauged

Dry

WwTP Inferred Groundwater Flow Direction, February 2021	
Figure 6-5	**Trility Pty Ltd**
Date: *18/01/2021*	Author: Persona Map Scale: 1:18,000
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

Water Level Gauged

Dry

WwTP Inferred Groundwater Flow Direction, April 2021		
Figure 6-6	Trility Pty Ltd	
Date: 18/01/2021	Author: ersona	GREENCAP
Revision: R1	Map Scale: 1:18,000	
	Coordinate System: GDA 1994 MGA Zone 56	

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 [1] (mg/L)	EC [1] (µS/cm)	pH [2] (pH Units)	ORP [3] (mV)	Temperature [3] (°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						
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

[1] The criteria for dissolved oxygen exceedance is a 20% reduction from the background value

[2] The criteria for pH exceedance is any change up or down from the background-derived trigger value

[3] 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	Trigger Value	Bores Exceeding Trigger Value		Exceedance Value, mg/L or µg/L (%)	
		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	-	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					
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 NATA-accredited 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)	P	P	P	P	P
EB2110810 (WwTP)	P	P	P	P	P
P = Pass X = Fail - = not required * = refer to report text					

Quality Assurance Criteria	Quality Control Criteria
Holding Times	**Accuracy**
Volatile Organic Carbons 14 days soil and water Semi Volatile Organic Carbons 7 days water, 14 days soil Metals 6 months, Mercury 28 days	Matrix spike, control sample: 70-130%, depending on analyte. Surrogate recovery: 50-150%, depending on analyte.
	Precision
	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.

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.

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.

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.

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.

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 A: Groundwater Field Sampling Records

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
21-7-20	1625	p4(6) Personal informa	2.390	2.748	3.140
27-8-20	0740		2.350	2.736	3.082
24-9-20	0900		2.336	2.752	3.042
31-10-20	0630		2.330	2.770	2.910
25-11-20	1130		2.460	2.875	3.183
9-12-20	0730		2.505	2.910	3.120
21-1-2021	1130		2.678	3.027	3.285
25-2-2021	1440		2.798	3.170	3.380
MARCH	NOT DONE				
22-4-2021	0830		2.450	2.720	3.040

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	[redacted]
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	22-4-2021

DESAL 1

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	6.5 (m)	Sampling device: Peristaltic (low flow)	GEO# ✓
Well diameter:	50mm	Water meter	YSI# PRO+ /
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	2.450 (m)	Interphase probe:	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
0839	2	2	2.46	25.7	0.22	570	—	3.94	129	—
0842	2	4	2.46	25.9	0.15	463	—	4.09	72	—
0846	2	6	2.46	25.9	0.12	456	—	4.11	38	—
0850	2	8	2.46	25.9	0.12	449	—	4.13	29	—
0854	2	10	2.46	25.9	0.11	445	—	4.15	12	—
0858	2	12	2.46	25.9	0.11	447	—	4.13	3	—
0902	2	14	2.46	25.9	0.11	448	—	4.10	-2.2	—
0906	2	16	2.46	25.9	0.11	449	—	4.12	-5.7	—
0910	2	18	2.46	25.9	0.11	443	—	4.14	-16.6	—
0914	2	20	2.46	25.9	0.11	450	—	4.12	-16.9	—
0918	2	22	2.46	25.9	0.12	450	—	4.12	-15.8	—
0922	2	24	2.46	25.9	0.12	450	—	4.10	-16.0	—
0926	2	26	2.46	25.9	0.13	453	—	4.10	-19.9	—
			SAMPLES	TAKEN						
Stabilisation Criteria (3 readings within ranges):		N/A	Drawdown <10cm	± 10%	±10%	±5%	± 10%	±0.1	±10mv	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

COLOUR
NOT TURBID
SLIGHT ODOUR

Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

0928
0932

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	sch4p4(6) Personal information
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	22-4-2021

DESAL 2

WELL DETAILS			SAMPLING EQUIPMENT		
Well depth:	6.0	(m)	Sampling device: Peristaltic (low flow)	GEO#	✓
Well diameter:	50 mm		Water meter:	YS#	PROT ✓
Casing type:	PVC		Turbidity Meter:	TM#	
Initial water level:	2.72	(m)	Interphase probe:	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
0957	2	2	2.73	24.5	0.27	188	–	3.97	78	–
1002	2	4	2.73	24.5	0.27	189	–	3.97	92	–
1006	2	6	2.73	24.5	0.19	195	–	4.02	99	–
1010	2	8	2.73	24.5	0.23	196	–	4.00	105	–
1014	2	10	2.73	24.5	0.22	195	–	4.02	107	–
1018	2	12	2.73	24.5	0.23	197	–	4.06	109	–
1022	2	14	2.73	24.5	0.24	197	–	4.06	111	–
1026	2	16	2.73	24.5	0.25	199	–	4.06	114	–
1030	2	18	2.73	24.5	0.25	199	–	4.09	114	–
			SAMPLES TAKEN							
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

COLOUR
SLIGHTLY TURBID
NO ODOUR

Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.00 L per metre

Field Technician #1

1035

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	[redacted]
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	12-4-2021

DESAL 3

WELL DETAILS			SAMPLING EQUIPMENT		
Well depth:	5.0	(m)	Sampling device: Peristaltic (low flow)	GEO#	✓
Well diameter:	50mm		Water meter	YSI#	PRO+ ✓
Casing type:	PVC		Turbidity Meter	TM#:	
Initial water level:	3.04	(m)	Interphase probe:	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
1137	2	2	3.40	27.2	0.25	1818	—	4.51	-128	—
1141	2	4	3.41	27.2	0.38	1809	—	4.51	-132	—
1145	2	6	3.42	27.2	0.58	1822	—	4.51	-135	—
1149	2	8	3.43	27.2	0.81	1810	—	4.53	-136	—
1153	2	10	3.43	27.2	1.00	1825	—	4.53	-136	—
1157	2	12	3.44	27.2	1.13	1812	—	4.53	-136	—
1201	2	14	3.45	27.2	1.23	1804	—	4.54	-136	—
1205	2	16	3.45	27.2	1.32	1788	—	4.54	-135	—
1209	2	18	3.46	27.2	1.41	1814	—	4.53	-135	—
1213	2	20	3.46	27.2	1.49	1790	—	4.54	-135	—
1217	2	22	3.46	27.2	1.56	1781	—	4.54	-135	—
1221	2	24	3.46	27.2	1.65	1784	—	4.55	-134	—
1225	2	26	3.46	27.2	1.71	1778	—	4.54	-134	—
1229	2	28	3.46	27.2	1.75	1772	—	4.55	-134	—
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	SAMPLES TAKEN	±10%	±3%	±10%	±0.1	±10mV	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

SLIGHT COLOUR
SLIGHT ODOUR

Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

1230

STP **Groundwater Monitoring Standing Water Level Measurement**

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

Date	Time	Operator	STP 1	STP 2	97-01	97-2	97-3	97-4	97-5	0.007	0.008
7-12-2020	1000	[redacted]	—	—	1.250	1.665	1.352	1.110	0.770	DRY	DRY
8-12-2020	0800		2.585	4.662	1.384	—	—	—	—	—	—
21-1-2021	1000		2.684	4.697	1.227	DRY	1.348	1.110	0.754	DRY	DRY
24-2-2021	1000		2.720	4.665	0.908	DRY	1.346	1.108	0.740	DRY	DRY
MARCH	NOT		MOST BORES NOT ACCESSABLE			DUE TO	FLOODING				
19-4-2021	1345		—	—	—	1.275	0.820	0.65	0.512	1.360	1.035
20-4-2021	0850		2.615	4.420	0.510	—	—	—	—	—	—

(6) Personal infor

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	ch4p4(6) Personal informatio
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	19-4-2021

97/2

WELL DETAILS:		SAMPLING EQUIPMENT:	
Well depth:	1.70 (m)	Sampling device: Peristaltic (low flow)	GSD#
Well diameter:	65mm	Water meter	YSI#
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	1.275 (m)	Interphase probe:	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
1506	1.3	1.3	1.650	—	—	—	—	—	—	—
BORE RAN DRY + DID NOT RECOVER.										
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 3%	± 10%	± 0.1	± 10mV	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

TURBID
NO COLOUR

Samples Taken	Number	Duplicate: QA_	Triplicate: QA_	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	
Project:	Groundwater bore installation and sampling	Sampled by:	s4p4(6) Personal informat
Location:	Agnes Water, Qld	Date:	19-4-2021

97/3

WELL DETAILS			SAMPLING EQUIPMENT	
Well depth:	1.69	(m)	Sampling device: Peristaltic (low flow)	GEO#
Well diameter:	65mm		Water meter	YSI#
Casing type:	PVC		Turbidity Meter	TM#
Initial water level:	0.350	(m)	Interphase probe:	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
1447	2	2	1.380	—	—	—	—	—	—	—
1451	1	3	1.680	—	—	—	—	—	—	—
		BORE RAN DRY & DID NOT RECOVER								
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	±5%	± 10%	± 0.1	± 10mV	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

TURBID
COLOUR

Samples Taken	Number	Duplicate: QA_	Triplicate: QA_	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client: 97-4
Project: Trility
Location: Groundwater bore installation and sampling
Agnes Water, Qld

Job No: [redacted]
Sampled by: [redacted]
Date: 19-4-2021

97-4

WELL DETAILS:
Well depth: 1.57 (m)
Well diameter: 65mm
Casing type: PVC
Initial water level: 0.65 (m)

SAMPLING EQUIPMENT:
Sampling device: Peristaltic (low flow) GEO#
Water meter - YSI#
Turbidity Meter TM#
Interphase probes: 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
1421	2	2	0.950	—	—	—	—	—	—	—
1425	1.6	3.6	1.550	—	—	—	—	—	—	—
		BORE RAN DRY & DID NOT RECOVER								
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour
TURBID

Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	sch4p4(6) Personal information
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	19-4-2021

97/5

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	0.512 (m)	Sampling device, Peristaltic (low flow)	GEO#
Well diameter:	65mm PVC	Water meter	YSI#
Casing type		Turbidity Meter	TM#
Initial water level:	0.512 (m)	Interphase probe:	IP#

Time	Amount purged (L)	Cumulative purged (L)	Water Level (m)	Temperature C	DO % sat	Sp. Conductivity uS/cm	Salinity PSU	pH Units	ORP mV	Turbidity NTU
1347	3.5	3.5	1.0	—	—	—	—	—	—	—
BORE RAN DRY & DID NOT RECOVER										
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

TURBID

Samples Taken	Number	Duplicate: QA_	Triplicate: QA_	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	sch4p4(6) Personal information
Project:	Groundwater bore installation and sampling	Sampled b	
Location:	Agnes Water, Qld	Date:	19-4-2021

00/07

WELL DETAILS			SAMPLING EQUIPMENT	
Well depth:	1.80 (m)		Sampling device: Peristaltic (low flow)	GEO#
Well diameter:	65mm		Water meter	YSI#
Casing type:	PVC		Turbidity Meter	TM#
Initial water level:	1.360 (m)		Interphase probe:	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
1530	0.8	0.8	1.690	—	—	—	—	—	—	—
		BORE RAN DRY & DID NOT RECOVER								
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	±10%	±5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

TURBID
NO COLOUR

Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000 m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	sch4p4(6) Personal information
Project:	Groundwater bore installation and sampling	Sampled b	
Location:	Agnes Water, Qld	Date:	19-4-2021

00/8

WELL DETAILS			SAMPLING EQUIPMENT	
Well depth:	1.785	(m)	Sampling device: Peristaltic (low flow)	GEO#
Well diameter:	65mm		Water meter	YSI#
Casing type:	PVC		Turbidity Meter	TM#
Initial water level:	1.035	(m)	Interphase probe:	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
1540	2	2	1.700	–	–	–	–	–	–	–
1544	0.5	2.5	1.770	–	–	–	–	–	–	–
		BORE RAN DRY & DID NOT RECOVER								
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mV	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

TURBID
NO COLOUR

Samples Taken	Number	Duplicate: QA_	Triplicate: QA_	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000 m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	ch4p4(6) Personal information
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	20-4-2021

STP 1

WELL DETAILS			SAMPLING EQUIPMENT	
Well depth:	15.36	(m)	Sampling device: Peristaltic (low flow)	GBO# ✓
Well diameter:	50mm		Water meter	YSI# PRO + ✓
Casing type:	PVC		Turbidity Meter	TM#
Initial water level:	2.615	(m)	Interphase probe:	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
0853	2	2	2.74	23.9	0.35	3843	—	6.60	17.2	—
0857	2	4	2.77	24.0	0.30	3826	—	6.60	33.5	—
0901	2	6	2.80	24.0	0.67	3802	—	6.59	37.9	—
0905	2	8	2.82	24.0	0.53	3793	—	6.58	41.2	—
0909	2	10	2.85	24.0	0.41	3814	—	6.58	2.8	—
0913	2	12	2.87	24.0	0.36	3788	—	6.58	-1.5	—
0917	2	14	2.88	24.0	0.33	3797	—	6.57	-3.5	—
0921	2	16	2.89	24.1	0.31	3786	—	6.57	-3.3	—
0925	2	18	2.90	24.1	0.30	3784	—	6.57	0.4	—
0929	2	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	24.1	0.28	3775	—	6.56	6.0	—
0945	2	28	2.94	24.1	0.28	3778	—	6.56	6.2	—
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown				± 10%	± 0.1	± 10mV	N/A

SAMPLES TAKEN

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

CLEAR
NO ODOUR

Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	[redacted]
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	20-4-2021

STP 2

WELL DETAILS			SAMPLING EQUIPMENT		
Well depth:	13.14	(m)	Sampling device: Peristaltic (low flow)	GEO#	✓
Well diameter:	50mm		Water meter	YSI#	PRO + ✓
Casing type:	PVC		Turbidity Meter	TM#	
Initial water level:	4.42	(m)	Interphase probe:	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
1024	2	2	4.83	24.2	2.17	11881	—	6.38	86.3	—
1028	2	4	4.85	24.2	2.04	11828	—	6.37	82.5	—
1033	2	6	4.86	24.2	1.72	11783	—	6.38	79.2	—
1037	2	8	4.86	24.2	1.43	11750	—	6.37	80.3	—
1041	2	10	4.86	24.1	1.26	11784	—	6.38	77.2	—
1045	2	12	4.86	24.1	1.06	11855	—	6.38	72.3	—
1049	2	14	4.86	24.2	0.94	11786	—	6.38	69.2	—
1054	2	16	4.86	24.1	0.88	11870	—	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	22	4.86	24.1	0.67	11817	—	6.38	68.7	—
1112	2	24	4.86	24.1	0.62	11802	—	6.38	69.6	—
1117	2	26	4.86	24.1	0.58	11770	—	6.38	68.7	—
1122	2	28	4.86	24.1	0.49	11752	—	6.38	68.5	—
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	SAMPLES TAKEN			± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

NO COLOUR
NO ODOUR
NO VISIBLE TURBIDITY

Samples Taken	Number	Duplicate: QA_	Triplicate: QA_	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m³ (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	sch4p4(6) Personal information
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	20-4-2021

97/1

WELL DETAILS			SAMPLING EQUIPMENT	
Well depth:	1.52 (m)		Sampling device: Peristaltic (low flow)	GEO# ✓
Well diameter:	50mm		Water meter	YSI# P20 + ✓
Casing type:	PVC		Turbidity Meter	TM#
Initial water level:	0.51 (m)		Interphase probe:	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
1158	2	2	0.51	21.7	2.47	378.9	—	5.82	122.7	—
1202	2	4	0.51	21.8	2.47	378.3	—	5.72	130	—
1206	2	6	0.51	21.8	2.47	378.0	—	5.72	132	—
1210	2	8	0.51	21.8	2.45	378	—	5.73	133	—
1214	2	10	0.51	21.8	2.48	377	—	5.75	133	—
			SAMPLES		TAKEN					
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

TURBID
NO COLOUR
NO ODOUR

Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000 m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

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

					Field					Inorganics									Metals											
					Dissolved Oxygen (DO)	Electrical Conductivity (EC)	pH	Oxidation Reduction Potential (ORP)	Temperature	Ammonia as N	Chloride	Kjeldahl Nitrogen Total	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total)	Oxides of Nitrogen	Total Phosphorus as P	Sulphate as SO4	Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	
					mg/L	µS/cm	pH_Units	mV	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
				LOR						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 background	No change from background	55	55	13	13	No change from background	0.2	0.2	1	1	1	1	
Bore_ID	*Period*	*Sample_Date*	*Plant*	*Lab_ReportNumber*	D_O	EC	pH	ORP	temp	Am	Cl	T_N_Kj	N_NO3	N_NO2	T_N	NOX	T_P	S_SO4	Al	Al_F	As	As_F	Bo	Cd	Cd_F	Chr_III_VI	Chr_III_VI_F	Co	Co_F
97-01	Dec-16	21/12/2016	WwTP	EB1630075	1.45	670	6.24	-43	25.9	0.02	196	0.5	0.06	<0.01	0.6	0.06	0.04	23	2860	3	1	<1	<50	<0.1	<0.1	2	<1	3	2
97-01	Jun-17	22/06/2017	WwTP	EB1712820003	0.26	810	6.14	161.4	20.2	<0.01	-	<0.1	<0.01	<0.01	<0.1	<0.01	<0.01	-	160	<10	<1	<1	<50	<0.1	<0.1	<1	<1	<1	<1
97-01	Dec-17	13/12/2017	WwTP	EB1726592	2.36	2829	6.32	75	25	0.13	70	0.4	<0.01	<0.01	0.4	<0.01	<0.01	8	1490	50	<1	<1	<50	<0.1	<0.1	<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	<0.01	0.2	0.02	<0.01	10	840	30	<1	<1	<50	<0.1	<0.1	<1	<1	<1	<1
97-01	Jun-18	6/06/2018	WwTP	EB1813834	0.42	720	6.32	197.5	19.7	0.02	189	0.2	<0.01	<0.01	0.2	<0.01	0.04	21	220	<10	<1	<1	<50	<0.1	<0.1	<1	<1	<1	<1
97-01	Sep-20	22/09/2020	WwTP	EB2025060	5.52	585	5.87	209.8	20.5	0.01	161	0.1	0.24	<0.01	0.3	0.24	<0.01	22	680	10	<1	<1	<50	<0.1	<0.1	<1.0	2	<1.0	<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**	<0.01	**0.8**	**0.02**	**0.04**	**8**	**1090**	**1540**	<1	<1	<50	<0.1	<0.1	<1	<1	<1	<1
DESAL 1	Sep-16	27/09/2016	IWTP	EB1623330	1.35	118	4.31	-135	22.9	<0.01	24	0.5	0.63	<0.01	1.1	0.62	0.06	<1	1030	450	<1	<1	<50	<0.1	<0.1	1	<1	<1	<1
DESAL 1	Dec-16	14/12/2016	IWTP	EB1629480	0.44	162.4	4.23	-123.9	24.5	0.14	34	0.7	0.08	<0.01	0.8	0.08	0.04	<5	1030	640	<1	<1	<50	<0.1	<0.1	1	<1	<1	<1
DESAL 1	Mar-17	8/03/2017	IWTP	EB1704526	0.01	89.2	4.48	254	26.3	0.12	17	1.4	<0.01	<0.01	1.4	<0.01	0.06	<1	2060	870	<1	<1	<50	<0.1	<0.1	2	<1	<1	<1
DESAL 1	Jun-17	21/06/2017	IWTP	EB1712688001	0.38	126.4	4.59	176.2	24.4	0.15	24	1	0.01	<0.01	1	0.01	0.07	16	940	400	<1	<1	<50	<0.1	<0.1	2	1	<1	<1
DESAL 1	Sep-17	27/09/2017	IWTP	EB1719944	1.38	459	6.24	60.6	23.5	0.03	139	0.2	0.08	<0.01	0.3	0.08	0.03	2	280	40	<1	<1	880	<0.1	<0.1	<1	<1	<1	<1
DESAL 1	Dec-17	14/12/2017	IWTP	ET1701842	1.15	187	5.03	-116.2	24.9	0.25	45	0.8	<0.01	<0.01	0.8	<0.01	0.01	<1	660	390	<1	<1	50	<0.1	<0.1	<1	<1	<1	<1
DESAL 1	Mar-18	22/03/2018	IWTP	EB1807442	0.05	554	4.55	-50.2	25.7	0.11	151	1.1	0.02	<0.01	1.1	0.02	0.08	<1	800	500	1	<1	610	<0.1	<0.1	<1	<1	<1	<1
DESAL 1	Jun-18	4/06/2018	IWTP	EB1813546	0.11	431	4.52	-22.6	24.7	0.05	107	1.4	0.74	<0.01	2.1	0.74	0.02	<1	1070	820	<1	<1	80	<0.1	<0.1	<1	<1	<1	<1
DESAL 1	Oct-18	8/10/2018	IWTP	EB1824231	0.15	192.3	4.08	79.9	23.7	0.14	46	0.8	0.17	<0.01	1	0.17	0.03	<1	670	410	<1	<1	<50	<0.1	<0.1	<1	<1	<1	<1
DESAL 1	Dec-18	18/12/2018	IWTP	EB1831182	1.25	177.3	4.08	231.1	25	0.11	37	0.8	0.78	<0.01	1.6	0.78	0.03	<1	840	560	<1	<1	<50	<0.1	<0.1	2	<1	<1	<1
DESAL 1	Mar-19	25/03/2019	IWTP	EB1907649	0.08	171.1	4.05	360	26.4	0.16	38	0.9	0.76	<0.01	1.7	0.76	0.04	<1.0	1090	420	<1.0	<1.0	<50	<0.1	<0.1	2	<1.0	<1.0	<1.0
DESAL 1	Jun-19	24/06/2019	IWTP	EB1916325	0.34	179.6	4.05	233	24.5	0.14	38	1.1	0.15	<0.01	1.2	0.15	0.05	5	950	580	<1.0	<1.0	<50	<0.1	<0.1	2	<1.0	<1.0	<1.0
DESAL 1	Sep-19	16/09/2019	IWTP	EB1924392	0.13	239	3.92	306	32.4	0.15	56	0.7	0.11	<0.01	0.8	0.11	0.02	2	420	420	<1.0	<1.0	50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
DESAL 1	Dec-19	16/12/2019	IWTP	EB1933892	0.88	278	3.89	248	25.2	0.12	71	0.8	0.02	<0.01	0.8	0.02	0.02	<1.0	560	470	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
DESAL 1	Apr-20	15/04/2020	IWTP	EB2010399	0.32	298.7	3.99	172.4	26.3	0.1	72	1.2	0.76	<0.01	2	0.76	<0.05	<5.0	590	480	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
DESAL 1	Jun-20	22/06/2020	IWTP	EB2016548	0.18	343.1	4.1		24.5	0.12	77	1.1	0.3	<0.05	1.4	0.3	0.01	<5	620	610	<0.001	<0.001	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
DESAL 1	Sep-20	24/09/2020	IWTP	EB2025327	0.28	632	4.14	124.6	23.7	0.13	178	1.6	<0.05	<0.05	1.6	<0.01	0.03	<5	1020	980	2	<1	<50	<0.1	<0.1	<1	1	<1.0	<1
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	<1	<50	<0.1	<0.1	2	<1	<1	<1
DESAL 1	Apr-21	22/04/2021	IWTP	EB2111143	**0.13**	**453**	**4.1**	**-20**	**25.9**	**0.08**	**116**	**1.7**	**0.53**	<0.05	**2.2**	**0.53**	<0.05	<5	**1020**	**1040**	<1	<1	**60**	<0.1	<0.1	**1**	**1**	<1	<1
DESAL 2	Sep-16	27/09/2016	IWTP	EB1623330	0.06	137.4	2.27	-134.3	22.4	<0.01	31	0.8	0.15	<0.01	1	0.15	0.07	<1	1160	400	<1	<1	<50	<0.1	<0.1	4	<1	<1	<1
DESAL 2	Dec-16	14/12/2016	IWTP	EB1629480	0.61	96.2	4.38	-121.9	23.5	0.1	18	0.7	0.34	<0.01	1	0.34	0.05	<5	1700	510	<1	<1	<50	<0.1	<0.1	3	<1	<1	<1
DESAL 2	Mar-17	8/03/2017	IWTP	EB1704526	0.12	160	4.15	286	24.5	0.1	33	3.4	0.18	<0.01	3.6	0.18	0.14	<1	980	340	<1	<1	<50	<0.1	<0.1	3	<1	<1	<1
DESAL 2	Jun-17	21/06/2017	IWTP	EB1712688002	0.83	193.7	4.33	9.8	23.6	0.1	48	1.1	0.02	<0.01	1.1	0.02	0.06	<1	950	490	<1	<1	<50	<0.1	<0.1	2	<1	<1	<1
DESAL 2	Sep-17	27/09/2017	IWTP	EB1719944	0.02	123	4.45	38.9	23.2	0.1	34	0.8	0.13	<0.05	0.9	0.13	0.08	<5	890	350	<1	<1	<50	<0.1	<0.1	2	<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	227.4	4.78	28.1	24.5	0.11	49	1.4	0.34	<0.01	1.7	0.34	0.03	<5	740	450	1	<1	<50	<0.1	<0.1	2	<1	<1	<1
DESAL 2	Jun-18	4/06/2018	IWTP	EB1813546	0.05	171.9	4.4	211.8	23.9	0.09	30	0.8	0.66	<0.01	1.5	0.66	0.02	<1	580	500	<1	<1	<50	<0.1	<0.1	1	<1	<1	<1
DESAL 2	Oct-18	8/10/2018	IWTP	EB1824231	0.93	229.8	3.98	143.6	23.1	0.14	54	1.6	1.91	<0.01	3.5	1.91	0.02	<1	820	650	<1	<1	<50	<0.1	<0.1	<1	<1	<1	<1
DESAL 2	Dec-18	18/12/2018	IWTP	EB1831182	1.26	166.9	4.07	381	23.8	0.11	33	0.7	0.82	<0.01	1.5	0.82	0.01	<1	540	590	<1	<1	<50	<0.1	<0.1	<1	<1	<1	<1
DESAL 2	Mar-19	25/03/2019	IWTP	EB1907649	0.05	268	3.82	329.8	24.7	0.12	66	0.8	0.21	<0.01	1	0.21	0.02	2	500	430	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
DESAL 2	Jun-19	24/06/2019	IWTP	EB1916325	0.23	225	3.82	265.8	23.5	0.14	50	0.9	0.03	<0.01	0.9	0.03	0.04	<1.0	520	400	<1.0	<1.0	<50	<0.1	<0.1	1	<1.0	<1.0	<1.0
DESAL 2	Sep-19	16/09/2019	IWTP	EB1924392	0.15	212	3.6	334	23	0.1	48	0.7	0.55	<0.01	1.2	0.55	0.01	1	350	370	<1.0	<1.0	50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
DESAL 2	Dec-19	16/12/2019	IWTP	EB1933892	0.98	194	3.71	292	23.9	0.08	46	1.3	0.07	<0.01	1.3	0.07	0.1	<1.0	510	450	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
DESAL 2	Apr-20	15/04/2020	IWTP	EB2010399	0.31	313.6	3.92	180.6	24.8	0.1	81	1.3	0.03	<0.01	1.3	0.03	0.1	2	1350	560	<1.0	<1.0	<50	<0.1	<0.1	3	<1.0	<1.0	<1.0
DESAL 2	Jun-20	22/06/2020	IWTP	EB2016548	0.32	238.2	4.3		23.8	0.15	52	1	<0.05	<0.05	1	<0.01	0.14	<5	620	590	<0.001	<0.001	<50	<0.1	<0.1	<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	0.9	<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	Dec-20	9/12/2020	IWTP	EB2032757	0.59	194.4	4.45	189.4	23.9	0.13	45	<0.5	0.07	<0.05	<0.5	0.07	<0.05	<5	1550	530	<1	<1	<50	<0.1	<0.1	4	<1	1	<1
DESAL 2	Apr-21	22/04/2021	IWTP	EB2111143	**0.25**	**199**	**4.09**	**114**	**24.5**	**0.05**	**43**	**0.6**	**0.39**	<0.05	**1**	**0.39**	**0.14**	<5	**400**	**360**	<1	<1	<50	<0.1	<0.1	<1	<1	<1	<1
DESAL 3	Sep-16	27/09/2016	IWTP	EB1623330	1.26	172	5.36	-56.1	24.7	<0.01	24	1.4	<0.01	<0.01	1.4	<0.1	0.2	<1	2920	540	3	3	<50	<0.1	<0.1	12	2	6	5
DESAL 3	Dec-16	14/12/2016	IWTP	EB1629480	1.24	183.3	5.28	-54.1	26.1	0.26	43	1.4	<0.01	<0.01	1.4	<0.01	0.19	<1	3090	460	4	2	<50	<0.1	<0.1	12	1	5	3
DESAL 3	Mar-17	8/03/2017	IWTP	EB1704526	0.01	153	5.19	-154	27.3	0.29	36	1.3	<0.01	<0.01	1.3	<0.01	0.28	<1	2920	540	2	2	<50	<0.1	<0.1	14	1	3	2
DESAL 3	Jun-17	21/06/2017	IWTP	EB1712688003	1.18	168	5.18	124	25.9	0.38	44	1.3	0.01	<0.01	1.3	0.01	0.1	<1	1180	420	2	2	<50	<0.1	<0.1	4	1	2	2
DESAL 3	Sep-17	27/09/2017	IWTP	EB1719944	0	170	5.2	-111	25.2	0.33	47	1.3	<0.01	<0.01	1.3	<0.01	0.16	<1	1070	360	2	2	<50	<0.1	<0.1	5	1	2	2
DESAL 3	Dec-17	14/12/2017	IWTP	ET1701842	1.71	199	5.08	-125.4	26.2	0.41	47	1	<0.01	<0.01	1	<0.01	0.1	<1	1160	460	1	<1	60	<0.1	<0.1	4	1	3	2
DESAL 3	Mar-18	22/03/2018	IWTP	EB1807442	0.06	202.3	5.33	-103.1	27.6	0.36	46	1.4	<0.01	<0.01	1.4	<0.01	0.1	3	1160	530	3	2	<50	<0.1	<0.1	5	2	2	2
DESAL 3	Jun-18	4/06/2018	IWTP	EB1813546	0.05	198.3	5.33	-119.7	26.3	0.3	42	0.6	0.02	<0.01	0.6	0.02	0.05	<1	1210	910	2	2	<50	0.1	<0.1	4	2	2	2

Agnes Water. Trility. Groundwater Sampling 2016-2021

					Field					Inorganics									Metals										
					Dissolved Oxygen (DO)	Electrical Conductivity (EC)	pH	Oxidation Reduction Potential (ORP)	Temperature	Ammonia as N	Chloride	Kjeldahl Nitrogen Total	Nitrate (as N)	Nitrite (as N)	Nitrogen (Total)	Oxides of Nitrogen	Total Phosphorus as P	Sulphate as SO4	Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)
					mg/L	µS/cm	pH_Units	mV	°C	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
				LOR						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 background	No change from background	55	55	13	13	No change from background	0.2	0.2	1	1	1	1
Bore_ID	***Period***	***Sample_Date***	***Plant***	***Lab_ReportNumber***	D_O	EC	pH	ORP	temp	Am	Cl	T_N_Kj	N_NO3	N_NO2	T_N	NOX	T_P	S_SO4	Al	Al_F	As	As_F	Bo	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	Dec-18	18/12/2018	IWTP	EB1831182	1.46	249.9	4.74	-130.6	26.4	0.26	58	0.9	<0.05	<0.01	0.9	<0.05	0.06	<1	880	880	1	2	<50	<0.1	<0.1	3	2	1	1
DESAL 3	Mar-19	25/03/2019	IWTP	EB1907649	0.05	234.6	4.8	-174.6	28	0.35	67	1.1	<0.01	<0.01	1.1	<0.01	0.07	<5.0	830	520	2	2	<50	<0.1	<0.1	4	2	<1.0	<1.0
DESAL 3	Jun-19	24/06/2019	IWTP	EB1916325	0.6	204	4.76	-130	25.6	0.41	51	1.5	<0.01	<0.05	1.5	<0.01	0.14	<5.0	2420	740	2	2	<50	<0.1	<0.1	10	2	2	1
DESAL 3	Sep-19	16/09/2019	IWTP	EB1924392	0.15	222	4.74	-171.8	25	0.39	56	1.5	<0.01	<0.01	1.5	<0.01	0.06	<1.0	1030	800	1	1	<50	<0.1	<0.1	4	3	<1.0	<1.0
DESAL 3	Dec-19	16/12/2019	IWTP	EB1933892	1.51	208	4.72	-155	26.6	0.38	54	1.6	<0.01	<0.01	1.6	<0.01	0.09	<1.0	870	1040	2	2	<50	<0.1	<0.1	3	3	<1.0	<1.0
DESAL 3	Apr-20	15/04/2020	IWTP	EB2010399	0.44	219	4.82	-177.7	27.6	0.5	60	1.6	<0.01	<0.01	1.6	<0.01	0.21	<1.0	920	730	1	1	<50	<0.1	<0.1	3	2	<1.0	<1.0
DESAL 3	Jun-20	22/06/2020	IWTP	EB2016548	0.34	202	5.07		26.3	0.47	47	1.2	<0.05	<0.05	1.2	<0.01	0.07	<5	840	1000	0.002	0.002	<50	<0.1	<0.1	3	3	<1.0	<1.0
DESAL 3	Sep-20	24/09/2020	IWTP	EB2025327	0.27	207.8	5.12	117.5	25	0.48	54	1.1	<0.05	<0.05	1.1	<0.01	0.07	<5	670	560	2	1	<50	<0.1	<0.1	3	2	<1.0	<1
DESAL 3	Dec-20	9/12/2020	IWTP	EB2032757	1.93	483.3	4.8	-31.1	26.3	0.75	148	0.8	<0.01	<0.01	0.8	<0.01	<0.05	2	640	390	1	2	<50	<0.1	<0.1	3	<1	1	1
DESAL 3	Apr-21	22/04/2021	IWTP	EB2111143	**1.75**	**1772**	**4.55**	**-134**	**27.2**	**1.64**	**545**	**2.1**	<0.01	<0.01	**2.1**	<0.01	**0.05**	**55**	**300**	**300**	**0.001**	**0.001**	**100**	<0.1	<0.1	<1	**1**	**1**	**1**
STP 1	Sep-16	28/09/2016	WwTP	EB1623330	2.78	3812	6.67	-24.3	23.6	<0.01	1020	<0.1	<0.01	<0.01	<0.1	<0.1	<0.01	91	40	<10	2	1	<50	<0.1	<0.1	<1	<1	<1	<1
STP 1	Dec-16	21/12/2016	WwTP	EB1630075	0	3709	6.65	-200.5	24.3	0.01	962	0.1	<0.01	<0.01	0.1	<0.01	0.02	98	10	<10	1	1	<50	<0.1	<0.1	<1	<1	<1	<1
STP 1	Mar-17	9/03/2017	WwTP	EB1704666	0.03	3800	6.64	187.6	24.3	0.01	998	<0.1	<0.01	<0.01	<0.1	<0.01	0.05	94	10	<10	2	1	<50	0.2	<0.1	<1	<1	<1	<1
STP 1	Jun-17	22/06/2017	WwTP	EB1712820001	1.1	3574	6.72	9.3	23.4	0.01	955	<0.1	<0.01	<0.01	<0.1	<0.01	0.1	100	<10	<10	2	1	<50	<0.1	<0.1	<1	<1	<1	<1
STP 1	Sep-17	28/09/2017	WwTP	EB1720060	0.03	3592	6.79	4.7	23.6	0.02	1140	<0.1	<0.01	<0.01	<0.1	<0.01	0.02	92	<10	<10	1	1	<50	<0.1	<0.1	<1	<1	<1	<1
STP 1	Dec-17	13/12/2017	WwTP	EB1726592	2.22	8420	6.51	-17.6	24	0.01	986	0.1	<0.01	<0.01	0.1	<0.01	0.02	90	<10	<10	2	1	<50	<0.1	<0.1	<1	<1	<1	<1
STP 1	Mar-18	21/03/2018	WwTP	EB1807282	0.15	4118	6.7	69	24.3	0.07	975	<0.1	<0.01	<0.01	<0.1	<0.01	0.03	98	<10	<10	1	1	<50	<0.1	<0.1	<1	<1	<1	<1
STP 1	Jun-18	6/06/2018	WwTP	EB1813834	0.14	4148	6.73	33.8	23.2	0.03	1040	<0.1	<0.01	<0.01	<0.1	<0.01	0.02	105	<10	<10	1	1	<50	<0.1	<0.1	<1	<1	<1	<1
STP 1	Oct-18	8/10/2018	WwTP	EB1824223	1.53	3475	6.55	-24.6	23.6	0.11	1050	<0.1	0.01	<0.01	<0.1	0.01	0.02	95	<10	<10	1	1	<50	<0.1	<0.1	<1	<1	<1	<1
STP 1	Dec-18	20/12/2018	WwTP	EB1831536	2.08	3812	6.61	11.9	23.9	0.04	991	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	93	<10	<10	1	<1	50	<0.1	<0.1	<1	<1	<1	<1
STP 1	Mar-19	26/03/2019	WwTP	EB1907817	0.3	3854	6.57	10.9	24.4	0.03	1060	0.2	0.04	<0.01	0.2	0.04	0.02	99	<10	<10	1	1	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
STP 1	Jun-19	25/06/2019	WwTP	EB1916591	0.54	3919	6.56	7.6	23.2	0.01	997	<0.1	<0.01	<0.01	<0.1	<0.01	0.01	97	<10	<10	1	1	<50	<0.1	<0.1	<1.0	<1.0	<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	<0.1	<0.1	<0.1	<0.1	<0.1	0.01	95	<10	<10	1	1	80	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
STP 1	Dec-19	17/12/2019	WwTP	EB1934065	2.64	3648	6.54	2.1	24	0.05	1020	<0.1	<0.01	<0.01	<0.1	<0.01	0.01	95	10	<10	1	1	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
STP 1	Apr-20	15/04/2020	WwTP	EB2010933	0.72	3729	6.71	-16.7	24.1	0.25	1020	0.3	<0.01	<0.01	0.3	<0.01	0.02	95	<10	<10	1	1	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0
STP 1	Jun-20	24/06/2020	WwTP	EB2016812	0.85	3844	6.67		23.7	0.03	1020	0.1	<0.01	<0.01	0.1	0.1	0.01	92	<10	<10	1	1	<50	<0.1	<0.1	2	<1.0	<1.0	<1.0
STP 1	Sep-20	22/09/2020	WwTP	EB2025060	0.55	3844	6.79	7	23.6	<0.01	1050	<0.1	<0.01	<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	Dec-20	8/12/2020	WwTP	EB2032617	1.09	3915	6.65	-2.2	24	0.18	1060	0.4	<0.01	<0.01	0.4	<0.01	0.03	92	<10	<10	1	<1	50	<0.1	<0.1	<1	<1	<1	<1
STP 1	Apr-21	20/04/2021	WwTP	EB2110810	**0.28**	**3780**	**6.56**	6.2	**24.1**	**0.17**	**1070**	**0.2**	<0.01	<0.01	**0.2**	<0.01	**0.02**	**98**	<10	<10	**1**	<1	<50	<0.1	<0.1	<1	<1	<1	<1
STP 2	Sep-16	28/09/2016	WwTP	EB1623330	3.72	11908	6.5	-160.5	22.9	<0.01	4160	<0.1	<0.01	<0.01	<0.1	<0.1	0.03	373	60	<10	2	1	70	<0.1	<0.1	<1	<1	2	2
STP 2	Dec-16	21/12/2016	WwTP	EB1630075	0.04	11734	6.44	-121.3	25.9	0.03	4060	<0.1	<0.01	<0.01	<0.1	<0.01	0.02	384	<10	<10	1	1	60	<0.1	<0.1	<1	<1	1	<1
STP 2	Mar-17	9/03/2017	WwTP	EB1704666	0	12124	6.47	187.6	23.1	0.01	3860	<0.1	0.01	<0.01	<0.1	0.01	0.05	400	<10	<10	2	1	<50	<0.1	<0.1	<1	<1	1	1
STP 2	Jun-17	22/06/2017	WwTP	EB1712820002	2.53	11407	6.53	25.8	22.9	0.06	4060	<0.1	<0.01	<0.01	<0.1	<0.01	<0.01	385	<10	<10	2	2	60	<0.1	<0.1	<1	<1	1	1
STP 2	Sep-17	28/09/2017	WwTP	EB1720060	0.06	11343	6.64	92.1	23.2	0.06	4230	<0.1	0.07	<0.01	<0.1	0.07	0.03	366	<10	<10	1	1	<50	<0.1	<0.1	<1	<1	1	1
STP 2	Dec-17	13/12/2017	WwTP	EB1726592	3.05	10739	6.56	46.4	23.2	0.02	3840	<0.1	<0.01	<0.01	<0.1	<0.01	0.02	294	<10	<10	2	2	<50	<0.1	<0.1	<1	<1	2	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	<10	3	3	60	<0.1	<0.1	<1	<1	3	3
STP 2	Jun-18	6/06/2018	WwTP	EB1813834	0.21	13178	6.58	116.2	22.8	0.05	4070	<0.5	0.01	<0.01	<0.5	0.01	0.08	394	<10	<10	1	2	80	<0.1	<0.1	<1	<1	2	2
STP 2	Oct-18	8/10/2018	WwTP	EB1824223	1.91	10918	6.36	10.2	22.8	0.05	4030	<0.5	<0.01	<0.01	<0.5	<0.01	<0.05	365	<10	<10	1	1	<50	<0.1	<0.1	<1.0	<1.0	1	1
STP 2	Dec-18	20/12/2018	WwTP	EB1831536	3.01	11880	6.44	119.4	23.2	0.04	3800	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	346	<10	<10	1	1	80	<0.1	<0.1	<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	0.1	0.01	<0.01	0.1	0.01	0.05	380	<10	<10	1	1	60	<0.1	<0.1	<1.0	<1.0	1	1
STP 2	Jun-19	25/06/2019	WwTP	EB1916591	0.95	12245	6.39	102.6	23.2	0.06	3780	<0.5	<0.01	<0.01	<0.5	<0.01	<0.05	379	<10	<10	1	1	50	<0.1	<0.1	<1.0	<1.0	1	1
STP 2	Sep-19	17/09/2019	WwTP	EB1924565	0.83	12364	6.5	121	23.3	0.04	3940	<0.1	<0.1	<0.1	<0.1	<0.1	0.02	375	<10	<10	1	1	<50	<0.1	<0.1	<1.0	<1.0	1	1
STP 2	Dec-19	17/12/2019	WwTP	EB1934065	3.24	11708	6.35	111	23.5	0.01	4020	<0.1	<0.01	<0.01	<0.1	<0.01	0.02	381	10	<10	1	1	60	<0.1	<0.1	<1.0	<1.0	1	1
STP 2	Apr-20	15/04/2020	WwTP	EB2010933	1.13	11732	6.53	85.5	24	0.18	3850	0.3	<0.01	<0.01	0.3	<0.01	0.04	369	<10	<10	1	2	<50	<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	0.07	369	<10	<10	2	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	23.9	0.01	3950	<0.5	<0.01	<0.01	<0.5	<0.01	0.07	366	<10	<10	2	2	<50	<0.1	<0.1	<1.0	2	1	2
STP2	Dec-20	8/12/2020	WwTP	EB2032617	1.59	12200	6.45	99.8	23.7	0.31	4000	0.6	<0.01	<0.01	0.6	<0.01	0.12	375	10	<10	2	<1	90	<0.1	<0.1	<1	<1	2	2
STP 2	Apr-21	20/04/2021	WwTP	EB2110810	**0.49**	**11800**	**6.38**	68.5	**24.1**	<0.01	**4000**	<0.5	**0.07**	<0.01	<0.5	**0.07**	**0.06**	**390**	<10	<10	**2**	**1**	<50	<0.1	<0.1	<1	<1	**2**	**2**

					Metals																								Microbiological	
					Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. Coli	Enterococci
					µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	cfu/100 ml	cfu/100 ml
				LOR	1	1	50	50	1	1	1	1	0.1	0.1	1	1	0.01	0.01	10	10	1	1	5	5	1	1
				Trigger Criteria	1.4	1.4	-	-	3.4	3.4	1900	1900	0.06	0.06	11	11	0.05	0.05	5	5	-	-	8	8	No change from background	No change from background
Bore_ID	***Period***	***Sample_Date***	***Plant***	***Lab_ReportNumber***	Cu	Cu_F	Fe	Fe_F	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	Dec-16	21/12/2016	WwTP	EB1630075	12	2	2820	<50	5	<1	566	67	<0.1	<0.1	2	<1	<0.01	<0.01	<10	<10	<1	<1	31	15	60	970
97-01	Jun-17	22/06/2017	WwTP	EB1712820003	<1	<1	100	<50	<1	<1	91	71	<0.1	<0.1	<1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	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	8	14	5	26
97-01	Mar-18	21/03/2018	WwTP	EB1807282	<1	<1	320	<50	<1	<1	6	3	<0.1	<0.1	<1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	9	98
97-01	Jun-18	6/06/2018	WwTP	EB1813834	<1	<1	90	<50	<1	<1	108	102	<0.1	<0.1	<1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	5
97-01	Sep-20	22/09/2020	WwTP	EB2025060	<1.0	<1.0	360	<50	<1.0	<1.0	12	1	<0.1	<0.1	<1.0	8	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	1
97-01	Apr-21	20/04/2021	WwTP	EB2110810	<1	<1	**380**	**250**	<1	<1	**13**	**8**	<0.1	<0.1	<1	<1	<0.01	<0.01	<0.01	<0.01	<1	<1	<5	**5**	**20**	**11**
DESAL 1	Sep-16	27/09/2016	IWTP	EB1623330	1	1	210	120	<1	<1	4	3	<0.1	<0.1	1	1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<10	<10
DESAL 1	Dec-16	14/12/2016	IWTP	EB1629480	1	1	270	160	<1	<1	4	3	<0.1	<0.1	1	<1	<0.01	<0.01	<10	<10	<1	<1	11	<5	<2	<2
DESAL 1	Mar-17	8/03/2017	IWTP	EB1704526	2	<1	740	330	<1	<1	4	3	<0.1	<0.1	1	7	0.01	0.01	<10	<10	<1	<1	<5	13	<10	<10
DESAL 1	Jun-17	21/06/2017	IWTP	EB1712688001	<1	<1	510	370	<1	<1	3	3	<0.1	<0.1	<1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<2	<2
DESAL 1	Sep-17	27/09/2017	IWTP	EB1719944	<1	<1	260	150	<1	<1	2	2	<0.1	<0.1	<1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
DESAL 1	Dec-17	14/12/2017	IWTP	ET1701842	<1	<1	970	840	<1	<1	7	5	<0.1	<0.1	<1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<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	Jun-18	4/06/2018	IWTP	EB1813546	<1	11	360	320	<1	1	6	6	<0.1	<0.1	<1	4	<0.01	<0.01	<10	<10	<1	<1	<5	27	<1	<1
DESAL 1	Oct-18	8/10/2018	IWTP	EB1824231	<1	<1	220	160	<1	<1	5	5	<0.1	<0.1	<1	<1	<0..01	<0.01	<10	<10	<1	<1	<5	<5	<2	<2
DESAL 1	Dec-18	18/12/2018	IWTP	EB1831182	<1	<1	240	210	<1	<1	5	5	<0.1	<0.1	<1	1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
DESAL 1	Mar-19	25/03/2019	IWTP	EB1907649	1	1	220	160	<1.0	<1.0	6	5	<0.1	<0.1	1	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<2.0	<2.0
DESAL 1	Jun-19	24/06/2019	IWTP	EB1916325	2	<1.0	420	290	<1.0	<1.0	6	6	<0.1	<0.1	1	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	9	<5.0	<10	<10
DESAL 1	Sep-19	16/09/2019	IWTP	EB1924392	<1.0	<1.0	290	250	<1.0	<1.0	7	7	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESAL 1	Dec-19	16/12/2019	IWTP	EB1933892	<1.0	<1.0	240	200	<1.0	<1.0	7	6	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESAL 1	Apr-20	15/04/2020	IWTP	EB2010399	<1.0	<1.0	180	140	<1.0	<1.0	8	8	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	6	<5.0	<1	<1
DESAL 1	Jun-20	22/06/2020	IWTP	EB2016548	<1.0	2	170	170	<1.0	<1.0	13	14	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	7	<1	<1
DESAL 1	Sep-20	24/09/2020	IWTP	EB2025327	1	<1	630	640	<1	<1	26	28	<0.1	<0.1	2	2	0.02	0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESAL 1	Dec-20	9/12/2020	IWTP	EB2032757	<1	<1	840	640	<1	<1	13	12	<0.1	<0.1	2	1	<0.01	<0.01	<10	<10	<1	<1	<5	7	<1	<1
DESAL 1	Apr-21	22/04/2021	IWTP	EB2111143	**2**	**1**	**640**	**630**	<1	<1	**11**	**11**	<0.1	<0.1	**6**	<1	<10	<10	<0.01	<0.01	<1	<1	**22**	<5	<1	<1
DESAL 2	Sep-16	27/09/2016	IWTP	EB1623330	2	1	620	350	2	<1	11	10	<0.1	<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	10	16	<10	<10
DESAL 2	Mar-17	8/03/2017	IWTP	EB1704526	2	<1	540	330	1	2	13	9	<0.1	<0.1	2	19	0.01	<0.01	<10	<10	<1	<1	<5	23	<100	<100
DESAL 2	Jun-17	21/06/2017	IWTP	EB1712688002	<1	<1	830	600	<1	<1	10	9	<0.1	<0.1	2	2	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<2	<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	Dec-17	14/12/2017	IWTP	ET1701842	<1	<1	720	380	<1	<1	8	6	<0.1	<0.1	2	<1	<0.01	<0.01	<10	<10	<1	<1	<5	9	<1	<1
DESAL 2	Mar-18	22/03/2018	IWTP	EB1807442	2	<1	750	560	<1	<1	7	6	<0.1	<0.1	1	1	<0.01	<0.01	<10	<10	<1	<1	<5	9	<1	<1
DESAL 2	Jun-18	4/06/2018	IWTP	EB1813546	<1	2	430	380	<1	<1	9	8	<0.1	<0.1	1	2	<0.01	<0.01	<10	<10	<1	<1	<5	9	<1	<1
DESAL 2	Oct-18	8/10/2018	IWTP	EB1824231	2	9	480	370	<1	<1	6	7	<0.1	<0.1	<1	2	0.01	<0.01	<10	<10	<1	<1	<5	18	<2	<2
DESAL 2	Dec-18	18/12/2018	IWTP	EB1831182	<1	<1	320	320	<1	<1	5	5	<0.1	<0.1	<1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
DESAL 2	Mar-19	25/03/2019	IWTP	EB1907649	<1.0	1	380	340	<1.0	<1.0	7	7	<0.1	<0.1	1	2	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	10	<2.0	<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	<1.0	5	0.014	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESAL 2	Dec-19	16/12/2019	IWTP	EB1933892	<1.0	<1.0	460	390	<1.0	<1.0	7	6	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESAL 2	Apr-20	15/04/2020	IWTP	EB2010399	2	<1.0	670	570	1	<1.0	30	28	<0.1	<0.1	2	1	0.04	<0.01	<10	<10	<1.0	<1.0	<5.0	7	<1	<1
DESAL 2	Jun-20	22/06/2020	IWTP	EB2016548	0.001	2	760	740	<1.0	<1.0	12	26	<0.1	<0.1	<1.0	1	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	9	<1	<1
DESAL 2	Sep-20	24/09/2020	IWTP	EB2025327	<1	<1	1010	1020	<1	<1	13	13	<0.1	<0.1	1	<1	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
DESAL 2	Dec-20	9/12/2020	IWTP	EB2032757	2	<1	990	700	1	<1	25	25	<0.1	<0.1	3	2	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<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	126	0.7	<0.1	14	9	<0.01	<0.01	<10	<10	<1	<1	11	6	<100	<100
DESAL 3	Dec-16	14/12/2016	IWTP	EB1629480	10	1	4930	2960	7	<1	143	100	0.6	<0.1	13	8	<0.01	<0.01	<10	<10	<1	<1	12	13	<10	<10
DESAL 3	Mar-17	8/03/2017	IWTP	EB1704526	9	<1	3890	2200	7	<1	97	50	0.9	<0.1	9	8	0.03	<0.01	<10	<10	<1	<1	8	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	Sep-17	27/09/2017	IWTP	EB1719944	2	<1	4040	3360	2	<1	57	50	0.2	<0.1	7	5	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<10	<10
DESAL 3	Dec-17	14/12/2017	IWTP	ET1701842	2	<1	2960	2400	2	<1	56	45	0.2	<0.1	6	4	<0.01	<0.01	<10	<10	<1	<1	15	13	<1	<1
DESAL 3	Mar-18	22/03/2018	IWTP	EB1807442	3	<1	3220	2710	2	<1	46	42	0.1	<0.1	6	5	0.02	<0.01	<10	<10	<1	<1	10	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

						Metals																						Microbiological	
						Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. Coli	Enterococci
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	cfu/100 ml	cfu/100 ml
					LOR	1	1	50	50	1	1	1	1	0.1	0.1	1	1	0.01	0.01	10	10	1	1	5	5	1	1
					Trigger Criteria	1.4	1.4	-	-	3.4	3.4	1900	1900	0.06	0.06	11	11	0.05	0.05	5	5	-	-	8	8	No change from background	No change from background
Bore_ID	*Period*	*Sample_Date*	*Plant*	*Lab_ReportNumber*		Cu	Cu_F	Fe	Fe_F	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
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	<2	<2
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	<5	<10	<10
DESAL 3	Mar-19	25/03/2019	IWTP	EB1907649		1	1	5450	4500	<1.0	<1.0	35	34	<0.1	<0.1	4	4	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	15	<2.0	<2.0
DESAL 3	Jun-19	24/06/2019	IWTP	EB1916325		6	<1.0	4440	3840	4	<1.0	45	41	0.3	<0.1	5	3	<0.01	<0.01	<10	<10	<1.0	<1.0	6	6	<10	<10
DESAL 3	Sep-19	16/09/2019	IWTP	EB1924392		2	<1.0	4300	4280	<1.0	<1.0	33	36	<0.1	<0.1	4	3	<0.01	<0.01	<10	<10	<1.0	<1.0	6	<5.0	<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	7	<5.0	<1	<1
DESAL 3	Apr-20	15/04/2020	IWTP	EB2010399		<1.0	<1.0	3990	3710	<1.0	<1.0	28	29	<0.1	<0.1	3	3	0.02	<0.01	<10	<10	<1.0	<1.0	6	8	<1	<1
DESAL 3	Jun-20	22/06/2020	IWTP	EB2016548		<1.0	<1.0	3000	3000	<1.0	<1.0	23	26	<0.1	<0.1	2	2	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5	<1	<1
DESAL 3	Sep-20	24/09/2020	IWTP	EB2025327		1	<1	3800	3550	<1	<1	28	26	<0.1	<0.1	2	2	<0.01	<0.01	<10	<10	<1.0	<1.0	<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
DESAL 3	Apr-21	22/04/2021	IWTP	EB2111143		<1	<1	**9850**	**10000**	<1	<1	**92**	**98**	<0.1	<0.1	**4**	**4**	<10	<10	<0.01	<0.01	<1	<1	<5	<5	<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	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
STP 1	Dec-16	21/12/2016	WwTP	EB1630075		<1	<1	1630	1560	<1	<1	1330	1300	<0.1	<0.1	1	1	<0.01	<0.01	<10	<10	<1	<1	20	6	<1	<1
STP 1	Mar-17	9/03/2017	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	<1	<1
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	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
STP 1	Sep-17	28/09/2017	WwTP	EB1720060		<1	<1	1790	1680	<1	<1	1390	1340	<0.1	<0.1	<1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
STP 1	Dec-17	13/12/2017	WwTP	EB1726592		<1	<1	1830	1660	<1	<1	1400	1330	<0.1	<0.1	<1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
STP 1	Mar-18	21/03/2018	WwTP	EB1807282		<1	<1	1700	1570	<1	<1	1310	1270	<0.1	<0.1	1	1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<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	<10	<10	<1	<1	<5	<5	<1	<1
STP 1	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	<5	<1	<1
STP 1	Dec-18	20/12/2018	WwTP	EB1831536		<1	<1	1780	1620	<1	<1	1350	1330	<0.1	<0.1	1	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	1
STP 1	Mar-19	26/03/2019	WwTP	EB1907817		<1.0	<1.0	1790	1580	<1.0	<1.0	1330	1270	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1.0	<1.0
STP 1	Jun-19	25/06/2019	WwTP	EB1916591		<1.0	<1.0	1680	1750	<1.0	<1.0	1290	1410	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<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	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP 1	Dec-19	17/12/2019	WwTP	EB1934065		<1.0	<1.0	1830	1610	<1.0	<1.0	1350	1260	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP 1	Apr-20	15/04/2020	WwTP	EB2010933		<1.0	<1.0	1820	1570	<1.0	<1.0	1390	1240	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5	<1	<1
STP 1	Jun-20	24/06/2020	WwTP	EB2016812		<1.0	<1.0	1660	1780	<1.0	<1.0	1260	1380	<0.1	<0.1	12	4	<0.01	<0.01	<10	<10	<10	<1.0	<1.0	<5.0	6	<1	<1
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	<10	<10	<1.0	<1.0	<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	<1	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
STP 1	Apr-21	20/04/2021	WwTP	EB2110810		<1	<1	**1830**	**1580**	<1	<1	**1240**	**1200**	<0.1	<0.1	<1	<1	<0.01	<0.01	<0.01	<0.01	<1	<1	<5	**5**	<1	<1
STP 2	Sep-16	28/09/2016	WwTP	EB1623330		<1	1	<50	<50	<1	<1	109	110	<0.1	<0.1	3	4	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
STP 2	Dec-16	21/12/2016	WwTP	EB1630075		<1	<1	<50	<50	<1	<1	106	105	<0.1	<0.1	3	3	0.04	0.04	<10	<10	<1	<1	<5	<5	<1	<1
STP 2	Mar-17	9/03/2017	WwTP	EB1704666		<1	<1	60	<50	<1	<1	104	114	<0.1	<0.1	3	6	0.07	0.06	<10	<10	<1	<1	<5	<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	<10	<1	<1	<5	<5	<1	<1
STP 2	Sep-17	28/09/2017	WwTP	EB1720060		<1	1	<50	<50	<1	<1	970	104	<0.1	<0.1	3	3	0.06	0.01	<10	<10	<1	<1	<5	<5	<1	<1
STP 2	Dec-17	13/12/2017	WwTP	EB1726592		<1	<1	<50	<50	<1	<1	130	121	<0.1	<0.1	3	3	<0.01	0.02	<10	<10	<1	<1	<5	<5	<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	<10	<1	<1	<5	<5	<1	<1
STP 2	Jun-18	6/06/2018	WwTP	EB1813834		<1	5	<50	<50	<1	<1	113	106	<0.1	<0.1	3	4	0.02	<0.01	<10	<10	<1	<1	15	10	<1	<1
STP 2	Oct-18	8/10/2018	WwTP	EB1824223		<1.0	6	<50	<50	<1.0	<1.0	105	98	<0.1	<0.1	3	3	0.04	<0.01	<10	<10	<1.0	<1.0	<5.0	12	<1	<1
STP 2	Dec-18	20/12/2018	WwTP	EB1831536		<1.0	<1.0	<50	<50	<1.0	<1.0	114	106	<0.1	<0.1	5	2	<0.05	<0.05	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP 2	Mar-19	26/03/2019	WwTP	EB1907817		<1.0	<1.0	<50	<50	<1.0	<1.0	102	110	<0.1	<0.1	2	3	0.02	0.02	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP 2	Jun-19	25/06/2019	WwTP	EB1916591		<1.0	<1.0	<50	<50	<1.0	<1.0	110	107	<0.1	<0.1	3	2	0.02	0.02	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP 2	Sep-19	17/09/2019	WwTP	EB1924565		<1.0	<1.0	<50	<50	<1.0	<1.0	111	126	<0.1	<0.1	3	2	0.03	0.03	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP 2	Dec-19	17/12/2019	WwTP	EB1934065		<1.0	<1.0	<50	<50	<1.0	<1.0	109	105	<0.1	<0.1	2	2	0.03	0.02	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP 2	Apr-20	15/04/2020	WwTP	EB2010933		<1.0	<1.0	<50	<50	<1.0	<1.0	113	111	<0.1	<0.1	3	3	0.02	0.01	<10	<10	<1.0	<1.0	<5.0	5	<1	<1
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	<10	<1.0	<1.0	17	<5.0	<1	<1
STP 2	Sep-20	22/09/2020	WwTP	EB2025060		<1.0	<1.0	<50	<50	<1.0	<1.0	108	117	<0.1	<0.1	3	12	0.04	0.03	<10	<10	<1.0	<1.0	<5.0	5	<1	<1
STP2	Dec-20	8/12/2020	WwTP	EB2032617		<1	<1	<50	<50	<1	<1	134	117	<0.1	<0.1	4	3	0.02	0.01	<10	<10	<1	<1	<5	<5	<1	<1
STP 2	Apr-21	20/04/2021	WwTP	EB2110810		<1	<1	<50	<50	<1	<1	**126**	**119**	<0.1	<0.1	**4**	**4**	<0.01	<0.01	**10**	**10**	<1	<1	<5	<5	<1	<1

Analyte	Unit	LOR	STP1 20/04/2021	STP1 Duplicate 20/04/2021	RPD(%)	DESAL 1 22/04/2021	DESAL 1 Duplicate 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	<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	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		<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	

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

ALS Environmental

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 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 08:30
Order number	: 4500067182	Date Analysis Commenced	: 21-Apr-2021
C-O-C number	: ----	Issue Date	: 30-Apr-2021 09:20
Sampler	: (6) Personal infor		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with 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	Brisbane Inorganics, Stafford, QLD
	Microbiologist	Brisbane Microbiological, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Assistant Laboratory Manager	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

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	97-01	STP1 Duplicate	----
				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	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**98**	**390**	**8**	**96**	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**1070**	**4000**	**101**	**1070**	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	**1.54**	<0.01	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	**0.001**	<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	**1.20**	**0.119**	**0.008**	**1.18**	----
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	----
Iron	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								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	97-01	STP1 Duplicate	----
				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	7439-97-6	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								
Silver	7440-22-4	0.01	µg/L	<0.01	**0.01**	<0.01	<0.01	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.17**	<0.01	**0.52**	**0.03**	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	<0.01	<0.01	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	**0.07**	**0.02**	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
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 Analyser								
^ 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								
ø Electrical Conductivity (Non Compensated)	----	1	µS/cm	**3780**	**11800**	**377**	**3780**	----
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 MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	**20**	<1	----
MW023: Enterococci by Membrane Filtration								
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	: 4(6) Personal inforr	Contact	: 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(6) Personal inforr		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with 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 infor	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Microbiologist	Brisbane Microbiological, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Assistant Laboratory Manager	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 (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- 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%
ED045G: Chloride by Discrete Analyser (QC Lot: 3637178)									
EB2110810-002	STP2	ED045G: Chloride	16887-00-6	1	mg/L	4000	4020	0.431	0% - 20%
EB2110582-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	10	10	0.00	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3635186)									
EB2110760-001	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
EB2110813-001	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
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.001	<0.001	0.00	No Limit

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 (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 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
EG020T: Total Metals 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
EG035F: Dissolved Mercury by FIMS (QC Lot: 3635185)									
EB2110810-003	97-01	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2110760-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit

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 (%)*
EG035T: Total Recoverable Mercury by 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 Water by ORC-ICPMS (QC Lot: 3635202)									
EB2110810-001	STP1	EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EG094T: Total metals in Fresh water by ORC-ICPMS (QC Lot: 3635424)									
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 Analyser (QC Lot: 3644703)									
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 N by Discrete Analyser (QC Lot: 3637175)									
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
EK057G: Nitrite as N by Discrete Analyser (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 plus Nitrate as N (NOx) 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
EK061G: Total Kjeldahl Nitrogen By Discrete 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
EK067G: Total Phosphorus as P by Discrete 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%

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) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3637176)								
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: 3635186)								
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: 3635420)								
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: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	101	82.0	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG035F: Dissolved Mercury by FIMS (QCLot: 3635185)								
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)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	97.6	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3635202)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	101	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3635424)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	103	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3644703)								
EK055G: 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: 3637175)								
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: 3637179)								
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 Analyser (QCLot: 3644705)								
EK059G: 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)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	98.2	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3638363)								
EK067G: 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**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED041G: Sulfate (Turbidimetric) 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
ED045G: Chloride by Discrete Analyser (QCLot: 3637178)							
EB2110582-002	Anonymous	ED045G: Chloride	16887-00-6	4000 mg/L	112	70.0	130
EG020F: Dissolved 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
		EG020A-F: Cobalt	7440-48-4	1 mg/L	97.6	70.0	130

Sub-Matrix: **WATER**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	Matrix Spike (MS) Report: SpikeRecovery(%) MS	Matrix Spike (MS) Report: Acceptable Limits (%) Low	Matrix Spike (MS) Report: Acceptable Limits (%) High
EG020F: Dissolved 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
EG020T: Total Metals 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
EG035F: Dissolved Mercury by FIMS (QCLot: 3635185)							
EB2110760-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	88.3	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3635422)							
EB2110665-004	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	99.6	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3644703)							
EB2109623-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	101	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3637175)							
EB2110582-002	Anonymous	EK057G: Nitrite as N	14797-65-0	4 mg/L	88.5	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3637179)							
EB2110998-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	105	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3644705)							
EB2110813-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	97.0	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3638364)							
EB2110409-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	# Not Determined	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3638363)							
EB2110409-003	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	# Not Determined	70.0	130

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	: 4(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 inform	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.

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.

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

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO 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	EB2110409--003	Anonymous	**Total Kjeldahl Nitrogen as N**	----	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
EK067G: Total Phosphorus as P by Discrete Analyser	EB2110409--003	Anonymous	**Total Phosphorus as P**	----	Not Determined	----	**MS recovery not determined, background level greater than or 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: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		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, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**----**	----	----	**22-Apr-2021**	18-May-2021	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
STP1, STP2, 97-01, 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 (EG020A-F)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**----**	----	----	**23-Apr-2021**	17-Oct-2021	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**23-Apr-2021**	17-Oct-2021	✓	**23-Apr-2021**	17-Oct-2021	✓
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**----**	----	----	**23-Apr-2021**	18-May-2021	✓

Matrix: **WATER**

Evaluation: × = Holding time breach ; ✓ = Within holding time.

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**----**	----	----	**27-Apr-2021**	18-May-2021	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**----**	----	----	**23-Apr-2021**	17-Oct-2021	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**23-Apr-2021**	17-Oct-2021	✓	**23-Apr-2021**	17-Oct-2021	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**----**	----	----	**27-Apr-2021**	18-May-2021	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**----**	----	----	**22-Apr-2021**	22-Apr-2021	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**----**	----	----	**27-Apr-2021**	18-May-2021	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**24-Apr-2021**	18-May-2021	✓	**24-Apr-2021**	18-May-2021	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**24-Apr-2021**	18-May-2021	✓	**24-Apr-2021**	18-May-2021	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**----**	----	----	**21-Apr-2021**	21-Apr-2021	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
STP1, STP2, 97-01, STP1 Duplicate	**20-Apr-2021**	**----**	----	----	**21-Apr-2021**	21-Apr-2021	✓

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: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates (DUP)							
Ammonia as N by Discrete analyser	EK055G	2	19	**10.53**	**10.00**	✓	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	2	20	**10.00**	**10.00**	✓	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 ORC-ICPMS	EG094-AgF	1	4	**25.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
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	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-ICPMS	EG094-AgF	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
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-ICPMS	EG094-AgF	1	4	**25.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard

Matrix: **WATER**

Evaluation: × = Quality Control frequency not within specification ; ✓ = Quality Control frequency within specification.

Quality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Method Blanks (MB) - Continued							
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	1	20	**5.00**	**5.00**	✓	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
Matrix Spikes (MS)							
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
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	1	20	**5.00**	**5.00**	✓	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

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 Cl - 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-AqF	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 by a discrete dynode ion detector. This method is compliant with NEPM Schedule B(3).

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 Analyser	EK059G	WATER	In house: Referenced to APHA 4500-NO3- F. Combined oxidised Nitrogen (NO2+NO3) is determined by Chemical Reduction and direct colourimetry by Discrete Analyser. This method is compliant with NEPM Schedule B(3)
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	WATER	In house: Referenced to APHA 4500-Norg D (In house). An aliquot of sample is digested using a high 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 Discrete Analyser	EK062G	WATER	In house: Referenced to APHA 4500-Norg / 4500-NO3-. This method is compliant with NEPM Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al, Zhang et al. This procedure involves sulphuric acid 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 sampler)	* EN67-B02	WATER	Field determinations as per methods described in APHA or supplied by client. The analysis is performed in the field by non-ALS samplers. ALS NATA accreditation does not apply for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9

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 - ORC	EN25-ORC	WATER	In house: Referenced to USEPA SW846-3005. This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground water samples for analysis by ORC- ICPMS. This method is compliant with NEPM Schedule B(3)

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CHAIN OF CUSTODY

ALS

ALS Laboratory: please tick →

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CLIENT: TRILITY

OFFICE: AGNES WATER

PROJECT: GROUNDWATER MONITORING PROJECT NO.:

ORDER NUMBER: PURCHASE ORDER NO.: 4500067182

PROJECT MANAGER: 6) Personal info CONTACT PH: DL: +61 7 49757975 | M: 6) Personal info

SAMPLER: 6) Personal info SAMPLER MOBILE: Personal i

COC Emailed to ALS? (YES / NO) EDD FORMAT (or default):

Email Reports to : Personal trility.com.au; awatergroup@trility.com.au

Email Invoice to (will default to PM if no other addresses are listed): *accountspayable@trility.com.au*

TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)
☐ Standard TAT (List due date):
☐ Non Standard or urgent TAT (List due date):

ALS QUOTE NO.: BN/222/16

COUNTRY OF ORIGIN:

COC SEQUENCE NUMBER (Circle)
COC: 1 2 3 4 5 6 7
OF: 1 2 3 4 5 6 7

RELINQUISHED BY: h4p4(6) Personal informatio
DATE/TIME: 20/04/2021 1430

RECEIVED BY: 6) Personal in
DATE/TIME: 21/4/21 0830

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY:
DATE/TIME:

FOR LABORATORY USE ONLY (Circle)
Custody Seal Intact? Yes No N/A
Free ice / frozen ice bricks present upon receipt? Yes No N/A
Random Sample Temperature on Receipt: °C
Other comment:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Toll Connote no. is MYTH779406

Environmental Division
Brisbane
Work Order Reference
EB2110810

Telephone : + 61-7-3243 7222

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required)								
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TABLE 1	Temp Field	DO Field	EC Field µs/cm	pH Field	ORP Field			
1	STP1	20/04/2021 0948	W		5	X	24.1	0.28	3778	6.56	6.2			
2	STP2	20/04/2021 1125	W		5	X	24.1	0.49	11752	6.38	68.5			
3	97-01	20/04/2021 1215	W		5	X	21.8	2.48	377	5.75	133.0			
4	97-2		W											Ran dry after purging and did not recover.
5	97-3		W											Ran dry after purging and did not recover.
6	97-4		W											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.
9	008		W											Ran dry after purging and did not recover.
~~10~~ 4	STP1 Duplicate	20/04/2021 0952	W		5	X	24.1	0.28	3778	6.56	6.2			
				TOTAL	20									

MICRO LAB

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

ALS Environmental

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 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	: 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	: 4p4(6) Personal informa		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with 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	Brisbane Inorganics, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Administration, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Microbiologist	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.
~ = 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

Sub-Matrix: WATER 9Matrix: WATER7				DESAL 1	DESAL 2	DESAL 8	DESAL 1 Duplicate	----
				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	----
ED(01) : Sulfate 9Turbidimetric7as SO0 2- by DA								
Sulfate as SO0 - Turbidimetric	14808-79-8	1	mg/L	<5	<5	44	<5	----
ED(04) : Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	113	08	404	113	----
E) (2(F: Dissolved Getals by ICP-GS								
Aluminium	7429-90-5	0.01	mg/L	1.(0	(.83	(.8(	1.(3	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	(.((1	<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	(.((1	<0.001	(.((1	(.((1	----
Copper	7440-50-8	0.001	mg/L	(.((1	<0.001	<0.001	(.((1	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	(.((1	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	(.((0	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
6inc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	<0.005	----
Ganganese	7439-96-5	0.001	mg/L	(.(11	(.((5	(.(5M	(.(12	----
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	----
Iron	7439-89-6	0.05	mg/L	(.38	(.8M	1(.(	(.30	----
E) (2(T: Total Getals by ICP-GS								
Aluminium	7429-90-5	0.01	mg/L	1.(2	(.0(	(.8(	1.(0	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	(.((1	<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	(.((1	<0.001	<0.001	(.((1	----
Copper	7440-50-8	0.001	mg/L	(.((2	<0.001	<0.001	(.((1	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	(.((1	<0.001	----
Nickel	7440-02-0	0.001	mg/L	(.((3	<0.001	(.((0	<0.001	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
6inc	7440-66-6	0.005	mg/L	(.(22	<0.005	<0.005	<0.005	----
Ganganese	7439-96-5	0.001	mg/L	(.(11	(.((5	(.(52	(.(11	----
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	(.(3	<0.05	(.1(	(.(3	----
Iron	7439-89-6	0.05	mg/L	(.30	(.8M	5.M4	(.Z1	----
E) (84F: Dissolved Gercury by FIGS								
Gercury	7439-97-6	0.0001	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	----
				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 Gercury 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 water 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 Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**(.(M**	**(.(4**	**1.30**	**(.12**	----
EK(4Z) : Nitrite as N by Discrete Analyser								
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 Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**(.48**	**(.85**	<0.01	**(.45**	----
EK(45) : Nitrite plus Nitrate as N 9NOx7 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 9TKN + 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								
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 9Temperature Compensated7	COND_TEMP	1	µS/cm	**048**	**155**	**1ZZ2**	**048**	----
ø Field Dissolved Oxygen	----	0.1	mg/L	**(.18**	**(.24**	**1.Z4**	**(.18**	----
GW((3: Faecal Coliforms & E.coli by GF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	<1	----
GW(28: Enterococci by Gembrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	<1	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2111108**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: 4(6) Personal inform	Contact	: 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	: 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		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 4		
No. of samples analysed	: 4		

Accreditation No. 825
Accredited for compliance with 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	Brisbane Inorganics, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Administration, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Microbiologist	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					
Laboratory sample ID	*Sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Acceptable RPD (%)*
ED401G: Sulfate (Turbidimetric) as SO0 2- by DA (QC Lot: 8304604)									
EB2111179-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	1250	1270	1.20	0% - 20%
EB2111179-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	100	99	1.47	0% - 20%
ED406G: C7loride by Discrete A5alyser (QC Lot: 8304601)									
EB2111179-003	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1280	1280	0.130	0% - 20%
EG424h: Dissolned F etals by ICP-F S (QC Lot: 83046v2)									
EB2111187-002	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
EB2111145-001	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
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	0.00	No Limit

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: Dissolved F etals by ICP-F S (QC Lot: 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 etals by ICP-F S (QC Lot: 83043M4)									
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: Dissolved F ercury by hIF S (QC Lot: 83046v8)									
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
EG486T: Total Reconerable F ercury by hIF S (QC Lot: 830433M)									

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 (%)*
EG486T: Total Recoverable Mercury by hIF S (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
EG490h: Dissolved Metals in Water by ORC-ICPMS (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
EG490T: Total metals in water by ORC-ICPMS (QC Lot: 83043MB)									
EB2111143-001	DESAL 1	EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	<0.01	0.00	No Limit
EK466G: Ammonia as N by Discrete Analyser (QC Lot: 8361814)									
EB2111143-001	DESAL 1	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.08	0.00	No Limit
EK46MG: Nitrite as N by Discrete Analyser (QC Lot: 8304689)									
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
EK469G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QC Lot: 8361849)									
EB2111022-001	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	----	0.01	mg/L	0.53	0.59	9.92	0% - 20%
EK431G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 830MB0v)									
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%
EK43MG: Total Phosphorus as P by Discrete Analyser (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

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) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Acceptable Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED401G: Sulfate (Turbidimetric) as SO0 2- by DA (QCLot: 8304604)								
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: 83046v2)								
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: 83043M4)								
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: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.2	82.0	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report: Result	Laboratory Control Spike (LCS) Report: Spike Concentration	Spike Recovery (%): LCS	Acceptable Limits (%): Low	Acceptable Limits (%): High
EG486h: Dissolved F ercury by hIF S (QCLot: 83046v8)								
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: 830433M)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	95.2	84.0	118
EG490h: Dissolved F etals i5 hres7 Water by ORC-ICPF S (QCLot: 83046v3)								
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 (QCLot: 83043MB)								
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: 8361814)								
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: 8304689)								
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 A5alyser (QCLot: 8361849)								
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 (QCLot: 830M80v)								
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 (QCLot: 830M80M)								
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**

Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Acceptable Limits (%): Low	Acceptable Limits (%): High
ED401G: Sulfate (Turbidimetric) as SO0 2- by DA (QCLot: 8304604)							
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: 8304601)							
EB2111179-004	Anonymous	ED045G: Chloride	16887-00-6	4000 mg/L	95.1	70.0	130
EG424h: Dissolved F etals by ICP-F S (QCLot: 83046v2)							
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
		EG020A-F: Lead	7439-92-1	1 mg/L	100	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	96.3	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Acceptable Limits (%)	
Laboratory sample ID	Sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG424h: Dissolved 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 etals 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: Dissolved F ercury by hIF S (QCLot: 83046v8)							
EB2111143-002	DESAL 2	EG035F: Mercury	7439-97-6	0.01 mg/L	101	70.0	130
EG486T: Total Reconerable 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 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 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 plus Nitrate as N (NOx) by Discrete A5alyser (QCLot: 8361849)							
EB2111143-002	DESAL 2	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	88.5	70.0	130
EK431G: Total Kjelda7l Nitroge5 By Discrete A5alyser (QCLot: 830M80v)							
EB2110470-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	84.1	70.0	130
EK43MG: Total P7osp7orus 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 inforr	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	: 48000671Q2	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.

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)(CkReport5

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

Outliers : Analysis Holding Time Compliance

- **NO Analysis Holding Time Outliers exist.**

Outliers : Frequency of Quality Control Samples

- **NO 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 anyk is provided herein5

9 olding time for leachate methods)e5g5 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 1Q0 days5 A recorded breach does not guarantee a breach for all non-volatile parameters5

9 olding times for ***VOC in soils*** 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 or . inyl Chloride and Styrene are not xey analytes of interesth concern5

Matriq: **WATER** Evaluation: × & 9 olding time breach K✓ & Within holding time5

Method / Container / Client Sample ID(s)	Sample Date	Extraction / Preparation			Analysis		
		Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
ED(01) : Sulfate KTurbidimetricj as SO0 2- by DA							
Clear Plastic Bottle - Natural KED(01) j							
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**20-Apr-2(21**	20-May-2021 ✓
DESAL 3/	DESAL 1 Duplicate						
ED(04) : Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural KED(04) j							
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**20-Apr-2(21**	20-May-2021 ✓
DESAL 3/	DESAL 1 Duplicate						
E) (2(F: Dissolved Metals by ICP-MS							
Clear HDPE KG-T ORCj - Filtered5Lab-acidified KE) (2(A-Fj							
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**2U-Apr-2(21**	1z-Oct-2021 ✓
DESAL 3/	DESAL 1 Duplicate						
E) (2(T: Total Metals by ICP-MS							
Clear HDPE KG-T ORCj - Gnfiltered5Lab-acidified KE) (2(A-Tj							
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**2; -Apr-2(21**	1z-Oct-2021 ✓	**2; -Apr-2(21**	1z-Oct-2021 ✓	
DESAL 3/	DESAL 1 Duplicate						
E) (84F: Dissolved Mercury by FIMS							
Clear HDPE KG-T ORCj - Filtered5Lab-acidified KE) (84Fj							
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**8(-Apr-2(21**	20-May-2021 ✓
DESAL 3/	DESAL 1 Duplicate						
E) (84T: Total Recoverable Mercury by FIMS							
Clear HDPE KG-T ORCj - Gnfiltered5Lab-acidified KE) (84Tj							
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**2U-Apr-2(21**	20-May-2021 ✓
DESAL 3/	DESAL 1 Duplicate						
E) (U0F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE KG-T ORCj - Filtered5Lab-acidified KE) (U0-AgFj							
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**2U-Apr-2(21**	1z-Oct-2021 ✓
DESAL 3/	DESAL 1 Duplicate						
E) (U0T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE KG-T ORCj - Gnfiltered5Lab-acidified KE) (U0-AgTj							
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**2; -Apr-2(21**	1z-Oct-2021 ✓	**2; -Apr-2(21**	1z-Oct-2021 ✓	
DESAL 3/	DESAL 1 Duplicate						

Matriq: **WATER**

Evaluation: × & 9olding time breach K✓ & Within holding time5

Method / Container / Client Sample ID(s)		Sample Date	Extraction / Preparation			Analysis		
			Date extracted	Due for extraction	Evaluation	Date analysed	Due for analysis	Evaluation
E3 (44) : Ammonia as N by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid KE3 (44) j								
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**8(-Apr-2(21**	20-May-2021	✓
DESAL 3/	DESAL 1 Duplicate							
E3 (47) : Nitrite as N by Discrete Analyser								
Clear Plastic Bottle - Natural KE3 (47) j								
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**20-Apr-2(21**	24-Apr-2021	✓
DESAL 3/	DESAL 1 Duplicate							
E3 (4U) : Nitrite plus Nitrate as N KNOxj by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid KE3 (4U) j								
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**8(-Apr-2(21**	20-May-2021	✓
DESAL 3/	DESAL 1 Duplicate							
E3 (91) : Total 3 eldahl Nitrogen By Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid KE3 (91) j								
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**2U-Apr-2(21**	20-May-2021	✓	**2U-Apr-2(21**	20-May-2021	✓
DESAL 3/	DESAL 1 Duplicate							
E3 (97) : Total Phosphorus as P by Discrete Analyser								
Clear Plastic Bottle - Sulfuric Acid KE3 (97) j								
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**2U-Apr-2(21**	20-May-2021	✓	**2U-Apr-2(21**	20-May-2021	✓
DESAL 3/	DESAL 1 Duplicate							
MW((9: Faecal Coliforms & E.coli by MF								
Sterile Plastic Bottle - Sodium Thiosulfate KMW((9j								
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**28-Apr-2(21**	23-Apr-2021	✓
DESAL 3/	DESAL 1 Duplicate							
MW(28: Enterococci by Membrane Filtration								
Sterile Plastic Bottle - Sodium Thiosulfate KMW(28j								
DESAL 1/	DESAL 2/	**22-Apr-2(21**	**----**	----	----	**28-Apr-2(21**	23-Apr-2021	✓
DESAL 3/	DESAL 1 Duplicate							

Quality Control Parameter Frequency Compliance

The followVing report summarises the fre; uency of laboratory (C samples analysed Vithin the analytical lot)skin Vhich the submitted sample)skVas)Verekprocessed5Actual 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: × & (uality Control fre; uency not Vithin specification K✓ & (uality Control fre; uency Vithin specification5

(uality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***Actual***	***Expected***	*Evaluation*	
Laboratory Duplicates)DUPk							
Ammonia as N by Discrete analyser	E=088G	1	8	**2(.((**	**1(.((**	✓	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)NOqkby 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)Turbidimetrickas 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.((**	✓	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	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-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-AgT	1	4	**24.((**	**4.((**	✓	NEPM 2013 B3 w ALS (C Standard
Nitrite and Nitrate as N)NOqkby 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)Turbidimetrickas 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.((**	✓	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-ICPMS	EG0z4-AgF	1	4	**24.((**	**4.((**	✓	NEPM 2013 B3 w ALS (C Standard

Matriq: **WATER**

Evaluation: × & (uality Control fre; uency not Within specification K✓ & (uality Control fre; uency Within specification5

(uality Control Sample Type		Count		Rate (%)			Quality Control Specification
Analytical Methods	*Method*	*QC*	*Regular*	***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.((**	✓	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
Matriq Spixes)MSk							
Ammonia as N by Discrete analyser	E=088G	1	8	**2(.((**	**4.((**	✓	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
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.((**	✓	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

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 follo Ving 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

Analytical Methods	Method	Matrix	Method Descriptions
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 AP9 A 4800 Cl - 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 4Q0 nm AP9 A 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 elements5Ions 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 elements5Ions 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 9g - B)FloV-injection)SnCl2k)Cold . apour generationk AASk Samples are 0548µm filtered prior to analysis5 FIM-AAS is an automated flameless atomic absorption techni; ue5 A bromateHbromide 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 9g - B)FloV-injection)SnCl2k)Cold . apour generationk AASk FIM-AAS is an automated flameless atomic absorption techni; ue5A bromateHbromide 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-AqF	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 Ions 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 detection5Ions 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

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 Analyser	E=08zG	WATER	In house: Referenced to AP9 A 4800-NO3- F5 Combined oqidised Nitrogen)NO2+NO3k is determined by Chemical Reduction and direct colourimetry by Discrete Analyser5This method is compliant Vith NEPM Schedule B)3k
Total =jeldahl Nitrogen as N By Discrete Analyser	E=061G	WATER	In house: Referenced to AP9 A 4800-Norg D)In housek5An ali; uot of sample is digested using a high 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 + Noqk By Discrete Analyser	E=062G	WATER	In house: Referenced to AP9 A 4800-Norg H4800-NO3-5This method is compliant Vith NEPM Schedule B)3k
Total Phosphorus as P By Discrete Analyser	E=067G	WATER	In house: Referenced to AP9 A 4800-P 9 / Jirxa et al/ Zhang et al5 This procedure involves sulphuric acid 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 QQ0nm using discrete analyser5This method is compliant Vith NEPM Schedule B)3k
Field Tests)performed by eqternal samplerk	* EN67-B02	WATER	Field determinations as per methods described in AP9 A or supplied by client5 The analysis is performed in the field by non-ALS samplers5 ALS NATA accreditation does not apply for this service5
Thermotolerant Coliforms w E5coli by Membrane Filtration	MW006	WATER	AS 42765 7
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS42765z

Preparation Methods	Method	Matrix	Method Descriptions
T=NHTP Digestion	E=061HE=067	WATER	In house: Referenced to AP9 A 4800 Norg - DKAP9 A 4800 P - 9 5This 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 Nitric-9 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 - ORC	EN28-ORC	WATER	In house: Referenced to USEPA SWQ46-30085 This is an Ultrapure Nitric acid digestion procedure used to prepare surface and ground Vater samples for analysis by ORC- ICPMS5 This method is compliant Vith NEPM Schedule B)3k

4/5

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
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☐GLADSTONE 46 Callemondah Drive Clinton QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.gladstone@alsglobal.com
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☐TOWNSVILLE 14-15 Desma Court Bohle QLD 4818 Ph: 07 4796 0600 E: [illegible]
☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: TRILITY	TURNAROUND REQUIREMENTS: (Standard TAT may be longer for some tests e.g. Ultra Trace Organics) ☐ Standard TAT (List due date): ☐ Non Standard or urgent TAT (List due date):
OFFICE: AGNES WATER	
PROJECT: GROUNDWATER MONITORING PROJECT NO.:	ALS QUOTE NO.: BN/222/16
ORDER NUMBER: PURCHASE ORDER NO.: 4500067182	COUNTRY OF ORIGIN:
PROJECT MANAGER: [redacted] CONTACT PH: DL: +61 7 49757975 | M: [redacted]	
SAMPLER: [redacted] SAMPLER MOBILE: [redacted]	RELINQUISHED BY: [redacted]
COC Emailed to ALS? (YES / NO) EDD FORMAT (or default):	
Email Reports to [redacted]@trility.com.au; [redacted]@trility.com.au; awatergroup@trility.com.au	DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): accountspayable@trility.com.au	22/04/2021 1400

COC SEQUENCE NUMBER (Circle)							
COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Tóizh 23/4/21		
DATE/TIME: 0830	DATE/TIME:	DATE/TIME:

FOR LABORATORY USE ONLY (Circle)

Custody Seal Intact?	Yes	No	N/A
Free ice / frozen ice bricks present upon receipt?	Yes	No	N/A
Random Sample Temperature on Receipt:		°C	
Other comment:			

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TABLE 1	Temp Field	DO Field	EC Field µs/cm	pH Field	ORP Field			Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please add field results to COA
1	DESAL 1	22/04/2021 0928	W		5	X	25.9	0.13	453	4.10	-20			
2	DESAL 2	22/04/2021 1035	W		5	X	24.5	0.25	199	4.09	114			
3	DESAL 3	22/04/2021 1230	W		5	X	27.2	1.75	1772	4.55	-134			
4	DESAL 1 Duplicate	22/04/2021 0932	W		5	X	25.9	0.13	453	4.10	-20			
				TOTAL	20									

Environmental Division
Brisbane
Work Order Reference
EB2111143

Telephone : + 61-7-3243 7222

MICRO LAB

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VB = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles.

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	1st January 2021 – 31st 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)

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

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."
Alf Larson STP Effluent	14/10/2021	Total Phosphorus	7 mg/L	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-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 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)
	8/12/2021			7.6 mg/L	
	15/12/2021			34 mg/L	
	22/12/2021			28 mg/L	

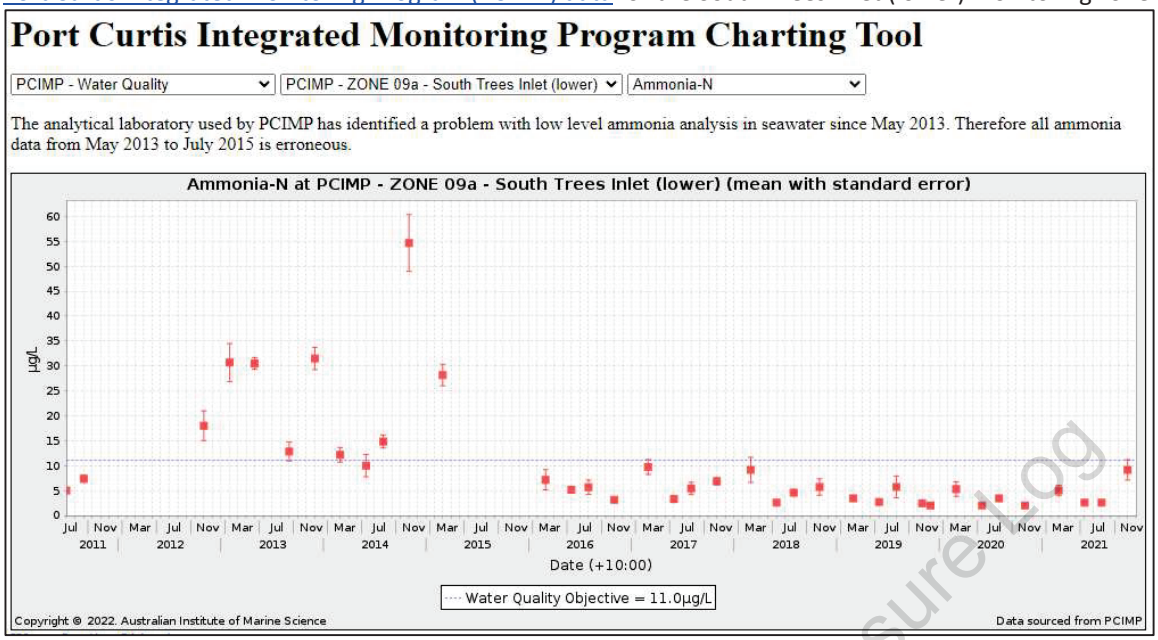
Location	Date of Non-Compliance Observed	Parameter	Limit	Result	Comments
Alf Larson STP Effluent	**20/08/2021**	Total Nitrogen	30 mg/L	51.5 mg/L	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the non-compliances, is planned to be turned offline while major corrective actions are outworked. 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) New Contractor from September 2021.
	1/09/2021			74.4 mg/L	
	15/09/2021			124.5 mg/L	
	7/10/2021			160 mg/L	
	14/10/2021			510 mg/L	
	21/10/2021			85 mg/L	
	28/10/2021			36 mg/L	
	4/11/2021			410 mg/L	
	11/11/2021			44 mg/L	
	25/11/2021			38 mg/L	
	2/12/2021			38 mg/L	

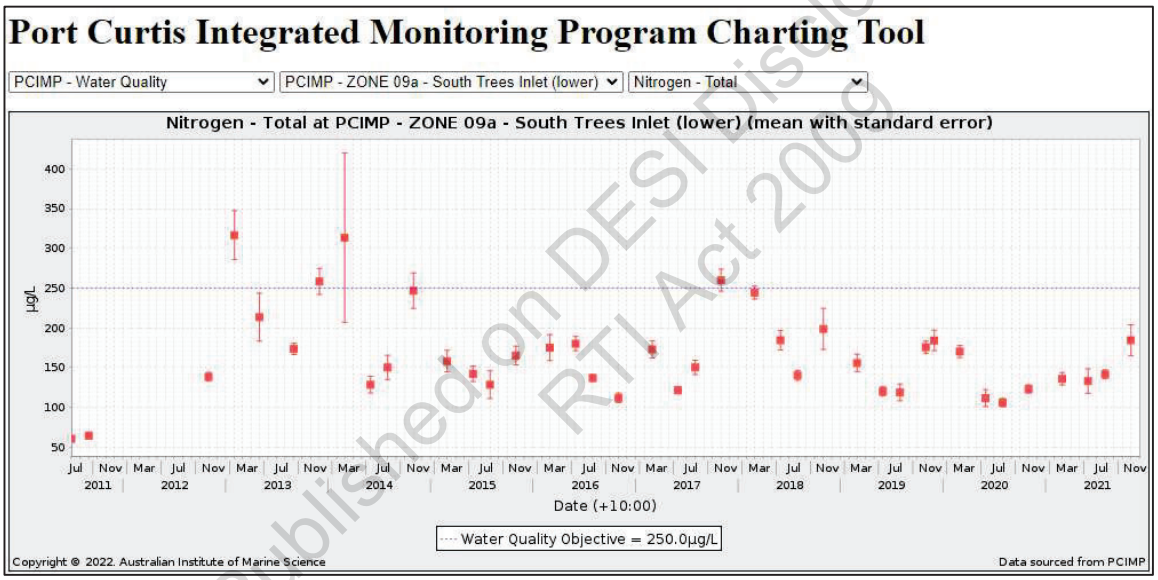
Location	Date of Non-Compliance Observed	Parameter	Limit	Result	Comments
Alf Larson STP Effluent	8/12/2021	Total Nitrogen	30 mg/L	42 mg/L	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the non-compliances, is planned to be turned offline while major corrective actions are outworked. 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)
	15/12/2021			54 mg/L	
	22/12/2021			47 mg/L	
	29/09/2021	Electrical Conductivity	2500µs/cm	2500 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 non-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 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)
	7/10/2021			3000 µs/cm	
	14/10/2021			3800 µs/cm	
Alf Larson STP Effluent	29/09/2021	pH	6.5-8.0	8.1	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) 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)
	7/10/2021			8.4	
	14/10/2021			8.4	
	15/12/2021			6	
Location	**Date of Non-Compliance Observed**	**Parameter**	**Limit**	**Result**	**Comments**

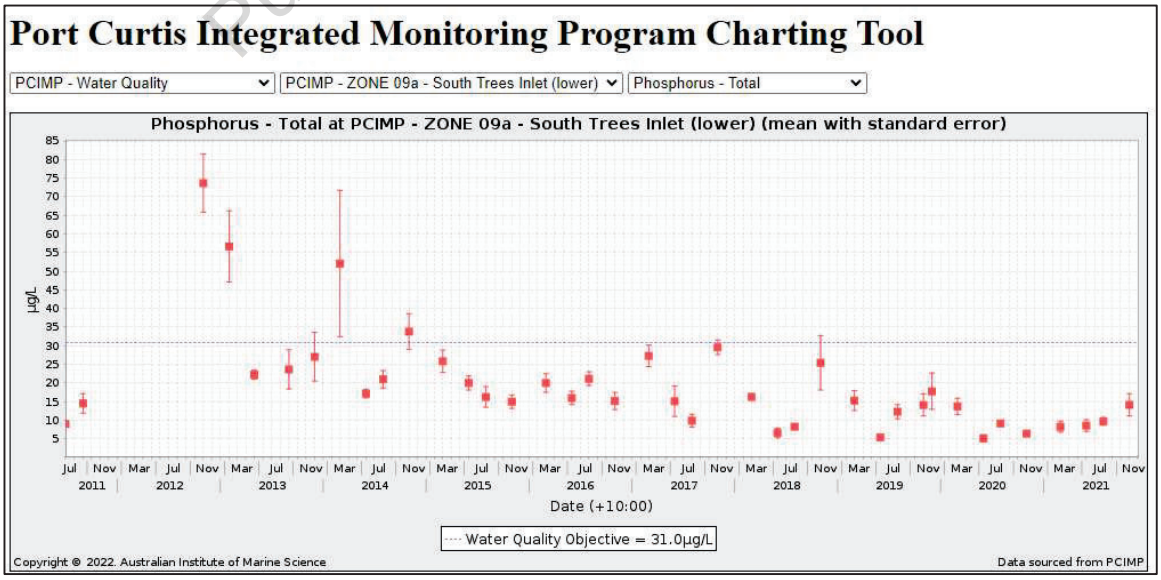
Alf Larson STP Effluent	21/07/2021	E.coli	<10 CFU/100 ml	ND	Exceedances were not discovered by GRC until July 2022. The site is wholly contractor operated and maintained - and at present, since discovering the non-compliances, is planned to be turned offline while major corrective actions are outworked. C-CPLRC-100288994 (case still open) 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)
	26/07/2021			ND	
	05/08/2021			ND	
	12/08/2021			ND	
	20/08/2021			ND	
	26/08/2021			ND	
	01/09/2021			ND	
	08/09/2021			ND	
	15/09/2021			ND	
Alf Larson STP Effluent	29/09/2021	E.coli	<10 CFU/100 ml	<10 MPN/100 ml	Tests were conducted in MPN/100 ml instead of CFU/100ml
	07/10/2021	E.coli	<10 CFU/100 ml	<10 MPN/100 ml	
Location	**Date of Non-Compliance Observed**	**Parameter**	**Limit**	**Result**	**Comments**

Alf Larson STP Effluent	14/10/2021	E. coli	10 CFU/100 ml	<10 MPN/100 ml	Tests were conducted in MPN/100 ml instead of CFU/100ml
	21/10/2021			<10 MPN/100 ml	
	28/10/2021			<10 MPN/100 ml	
	4/11/2021			<10 MPN/100 ml	
	11/11/2021			<10 MPN/100 ml	
	18/11/2021			ND	No Data Available
	25/11/2021			<10 CFU/100ml	LOR is equal to the EA maximum Limit
	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			<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).







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

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 exceedances were reported to DES (04/07/2021) N-100108621
10-Jul	14.29	
22-Jul	21.37	
23-Jul	35.05	
24-Jul	11.47	
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

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

Month	South Trees WWTP Excess Volume Discharged >1200KL/Day) KL	Date	Comments
Jan-21	1609	(01/01)	Following Internal reviews, all the exceedances were reported to DES (04/07/2021) C-CPLRC-100108622
	1383	(26/01)	
Feb-21	1392	(07/02)	
Mar-21	1593	(16/03)	
	1743	(21/03)	
	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 reviews, all the exceedances were reported to DES (04/07/2021) C-CPLRC-100108622
Jun-21	1356	(06/06)	
	1382	(27/06)	
Jul-21	1858	(04/07)	
	1258	(22/07)	
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)
Dec-21	1312	(05/12)	Exceedance of maximum Daily limit- Notified to DES (06/12/21)- reported as 1391KL- Actual was 1312KL

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	1st January 2022 – 30th 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;

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)

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

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."
Alf Larson STP Effluent	14/10/2021	Total Phosphorus	7 mg/L	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-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 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)
	8/12/2021			7.6 mg/L	
	15/12/2021			34 mg/L	
	22/12/2021			28 mg/L	

Location	Date of Non-Compliance Observed	Parameter	Limit	Result	Comments
Alf Larson STP Effluent	**20/08/2021**	Total Nitrogen	30 mg/L	51.5 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. 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)
	1/09/2021			74.4 mg/L	
	15/09/2021			124.5 mg/L	
	7/10/2021			160 mg/L	
	14/10/2021			510 mg/L	
	21/10/2021			85 mg/L	
	28/10/2021			36 mg/L	
	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
Alf Larson STP Effluent	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. 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)
	15/12/2021			54 mg/L	
	22/12/2021			47 mg/L	
	29/09/2021	Electrical Conductivity	2500µs/cm	2500 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 non-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 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)
	7/10/2021			3000 µs/cm	
	14/10/2021			3800 µs/cm	
Alf Larson STP Effluent	29/09/2021	pH	6.5-8.0	8.1	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) 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)
	7/10/2021			8.4	
	14/10/2021			8.4	
	15/12/2021			6	

Location	Date of Non-Compliance Observed	Parameter	Limit	Result	Comments
Alf Larson STP Effluent	21/07/2021	E.coli	<10 CFU/100 ml	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) 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)
	26/07/2021			ND	
	05/08/2021			ND	
	12/08/2021			ND	
	20/08/2021			ND	
	26/08/2021			ND	
	01/09/2021			ND	
	08/09/2021			ND	
	15/09/2021			ND	
Alf Larson STP Effluent	29/09/2021	E.coli	<10 CFU/100 ml	<10 MPN/100 ml	Tests were conducted in MPN/100 ml instead of CFU/100ml
	07/10/2021	E.coli	<10 CFU/100 ml	<10 MPN/100 ml	

Location	Date of Non-Compliance Observed	Parameter	Limit	Result	Comments
Alf Larson STP Effluent	14/10/2021	E. coli	10 CFU/100 ml	<10 MPN/100 ml	Tests were conducted in MPN/100 ml instead of CFU/100ml
	21/10/2021			<10 MPN/100 ml	
	28/10/2021			<10 MPN/100 ml	
	4/11/2021			<10 MPN/100 ml	
	11/11/2021			<10 MPN/100 ml	
	18/11/2021			ND	No Data Available
	25/11/2021			<10 CFU/100ml	LOR is equal to the EA maximum Limit
	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			<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

Location	Date of Non-Compliance Observed	Parameter	Limit	Result	Comments
Alf Larson STP Effluent	19/01/22	Total Phosphorous	7 mg/L	11	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) 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)
	27/01/22			12	
	2/02/22			22	
	11/02/22			14	
	16/02/22			18	
	25/02/22			15	
	3/03/22			7.4	
	10/03/22			ND	
	16/03/22			13	
	28/03/22			ND	
Alf Larson STP Effluent	10/3/22	Electrical Conductivity	2500µs/cm	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) 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)
	28/03/22			ND	
	5/04/22			ND	
	14/04/22			ND	
	21/04/22			3400	
Alf Larson STP Effluent	25/02/22	pH	6.5-8.0	8.3	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) 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)
	10/03/22			ND	
	28/03/22			ND	
	5/04/22			ND	
	14/04/22			ND	
	31/05/22			6.4	
	14/06/22			8.2	
Alf Larson STP Effluent	7/01/22	Total Nitrogen	30 mg/L	47	
	12/01/22			50	

Location	Date of Non-Compliance Observed	Parameter	Limit	Result	Comments
Alf Larson STP Effluent	19/01/22	Total Nitrogen	30 mg/L	55	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) 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)
	27/01/22			36	
	2/2/22			46	
	11/2/22			50.1	
	16/2/22			39	
	25/02/22			31	
	10/3/22			ND	
	28/03/22			ND	
	25/4/22			41	
	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	

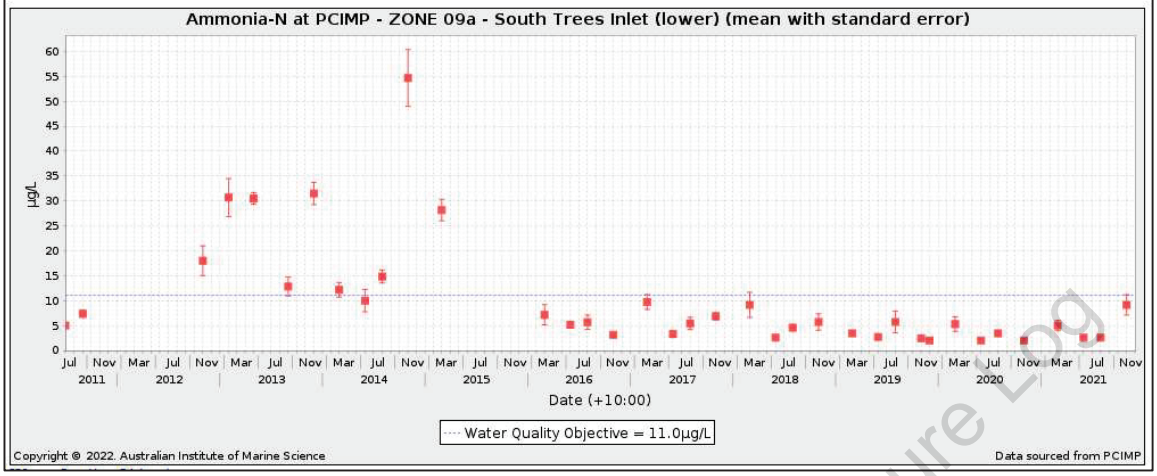
Location	Date of Non-Compliance Observed	Parameter	Limit	Result	Comments
Alf Larson STP Effluent	7/01/22 to 28/06/22	E.coli	10 CFU/100 ml	<10	LOR is equal to the EA maximum Limit
	12/01/22			<100	LOR > EA Max limit
	10/03/22			ND	No Data
	28/3/22			ND	No Data
	21/04/22			>2000	Sample Bottles not labelled.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

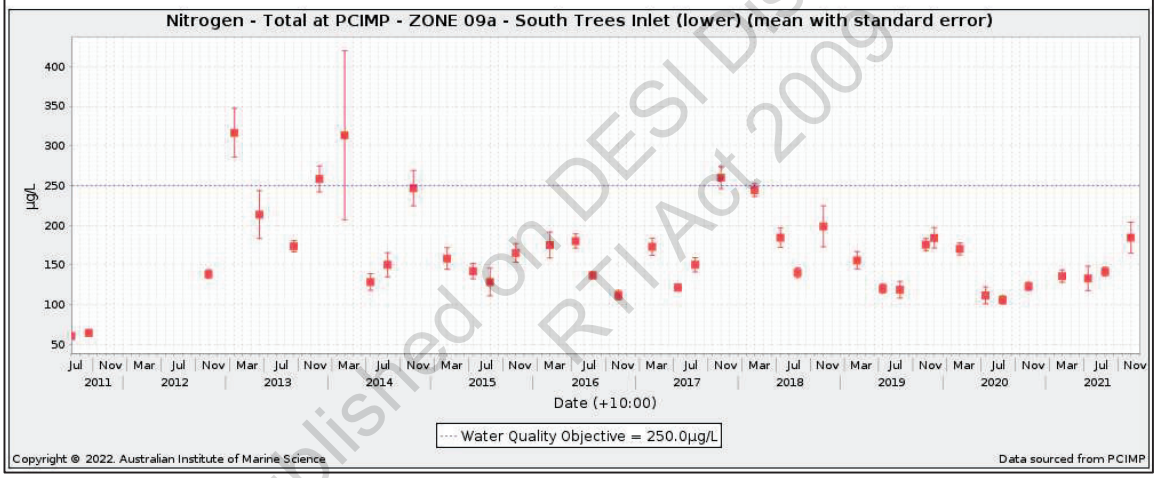
PCIMP - Water Quality | PCIMP - ZONE 09a - South Trees Inlet (lower) | Ammonia-N

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.



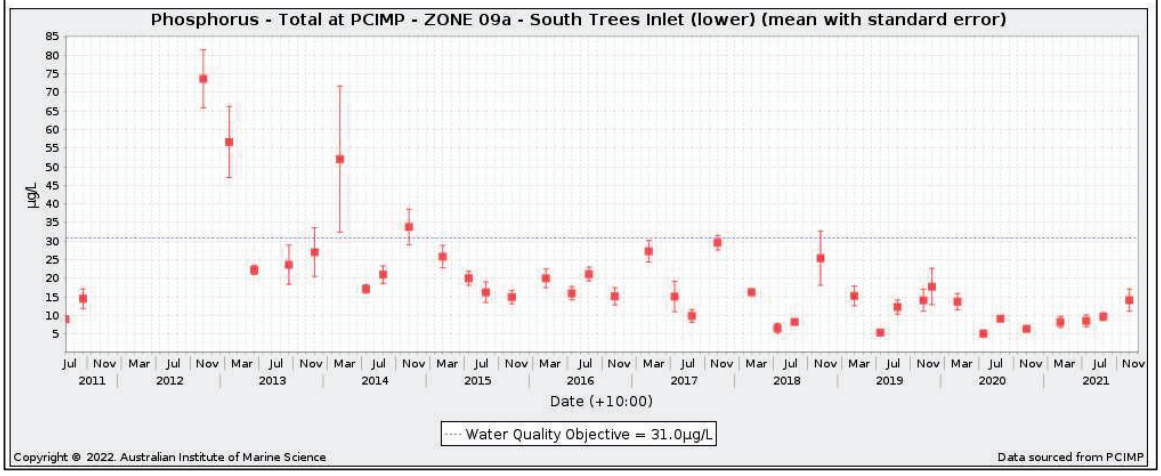
Port Curtis Integrated Monitoring Program Charting Tool

PCIMP - Water Quality | PCIMP - ZONE 09a - South Trees Inlet (lower) | Nitrogen - Total



Port Curtis Integrated Monitoring Program Charting Tool

PCIMP - Water Quality | PCIMP - ZONE 09a - South Trees Inlet (lower) | Phosphorus - Total



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.
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:

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
Jan-22	11.52
Feb-22	8.79
Mar-22	186.57
Apr-22	11.51
May-22	128.72
June-22	82.43

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
Jan-22	218.153
Feb-22	206.836
March-22	186.256
Apri-22	215.549
May-22	80.714
June-22	190.968

Gladstone WWTP Flow Exceeding 10 ML/Day		
Month	Exceedance (ML)	Comments
9-Jul 21	29.14	Following Internal reviews, all the exceedances were reported to DES (04/07/2021) N-100108621
10-Jul 21	14.29	
22-Jul 21	21.37	
23-Jul 21	35.05	
24-Jul 21	11.47	
8-Sep 21	10.26	
11/03/22	29.20	- Report : C-CPLRC-100221566
12/03/22	37.23	
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-100256310
25/05/22	13.16	C-CPLRC-100261243

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
Jan-22	27.353
Feb-22	21.854
March-22	43.405
April-22	25.287
May-22	50.350
June-22	32.701

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	

South Trees Flow Exceedances Jan-21 to June 22

Month	South Trees WWTP Excess Volume Discharged >1200KL/Day) KL	Date	Comments
Jan-21	1609	(01/01)	Following Internal reviews, all the exceedances were reported to DES (04/07/2021) C-CPLRC-100108622
	1383	(26/01)	
Feb-21	1392	(07/02)	
Mar-21	1593	(16/03)	
	1743	(21/03)	
	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 reviews, all the exceedances were reported to DES (04/07/2021) C-CPLRC-100108622
Jun-21	1356	(06/06)	
	1382	(27/06)	
Jul-21	1858	(04/07)	
	1258	(22/07)	
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	C-CPLRC-100221566
	2712	10/03/2022	
	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

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" , "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 - 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

Queensland Government

Shari Sievers
Community Response Officer
Community Response | Operational Support
Department of Environment and Science
P 1300 130 372 (option 2) **E** pollutionhotline@des.qld.gov.au
Lvl 9 400 George Street, BRISBANE QLD 4000
GPO Box 2454, BRISBANE QLD 4001

From: Chris.Irving <Chris.Irving@gladstone.qld.gov.au>
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.

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: Chris.Irving@gladstone.qld.gov.au | Website: www.gladstone.qld.gov.au

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.qld.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
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; 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

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.

Jane Doran
PO Box 29 Gladstone Qld 4680
Phone: 07 4970 0700

Jane.Doran@gladstone.qld.gov.au

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 ﷺ EPPR00959913) for both 13 Aug 2020 and 20 Aug 2020.

Kind Regards.

Martin Tumbers
Acting Compliance and Internal Audit Officer
GLADSTONE REGIONAL COUNCIL
PO Box 29 Gladstone QLD 4680
Phone: 07 4970 0700 | Fax: 07 4970 0700
Website: www.gladstone.qld.gov.au

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:	Please find following: • Galcon – Daily Station's Consumption Report (13 August 2020 – 19 August 2020) • Trility Over Irrigation Action Plan
Reporter	
Name: Jane Doran	Date: 28 August 2020

8/28/2020 06:11:17 AM

Daily Station's Consumption in m³

From Date
Thursday, August 13, 2020
To Date
Wednesday, August 19, 2020

Effluent 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
2020	Aug	13				350.00	202.00	350.00							9.00	911.0
		14					78.00		280.00	280.00	280.00				21.00	939.0
		15										280.00	280.00	280.00	16.00	856.0
		16	260.00	260.00	260.00										16.00	796.0
		17					280.00								3.00	283.0
		18				210.00		210.00							6.00	426.0
		19							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.
2. 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.	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.
3. 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?	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.
4. 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.	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.	Team Leader	20/8/2020	Completed. Running between 7am-4pm there are not enough hours to over irrigate.
6. Have a specialist check the program and functionality. If changes are made, then conduct a thorough testing. Report to Wade any program bug fixes.	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
7. Perform daily manual valve isolations on plots which aren't operating.	Team Leader	20/8/2020	Completed and Ongoing
8. 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.	Team Leader	21/8/2020	Completed
9. Follow up on the ordered valve diaphragms whereabouts	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.

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.
  Scope - 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.
  Timeframe: 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 get hold 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,

Myra dela Cruz
Senior Environmental Officer
Coal & Central QLD Compliance | Gladstone

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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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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
TOC	Top of Casing
Trility	Trility Pty Ltd
µS/cm	microsiemens per centimetre
µg/L	mircograms per litre
WwTP	Wastewater Treatment Plant

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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 1-1 Location 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 (**Figure 2-1)**
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) (**Figure 2-2**)

*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.

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 period July 2019 to June 2020 in accordance with Conditions WT8-AW, WT9-AW, WT10-AW and WT11-AW of the Environmental Authority.

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**).

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.

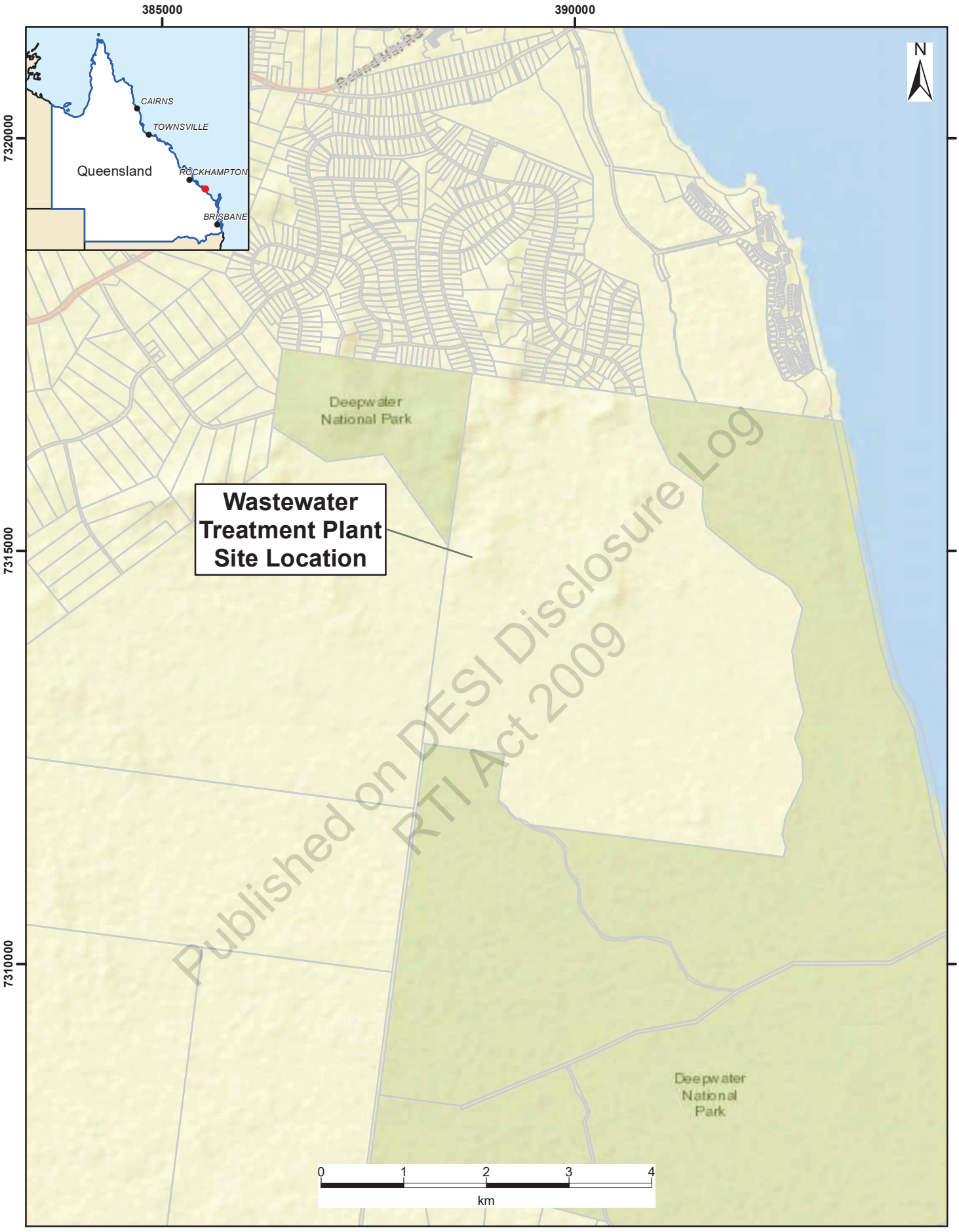
As groundwater flow is inferred as flowing in a southerly direction, impacts from the release of chemicals and/or contaminants on residents drawing water from this aquifer at Agnes Water is unlikely.

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.

Site Location of Integrated Water Treatment Plant	
Figure 2-1	**Trility Pty Ltd**
Date: *10/05/2018*	**Author:** ersona **Map Scale:** 1:8,000
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C114943_Trility Pty Ltd\GIS\Agnes Water\J143710-01_Sept_2017_QR\mxd\FIG_2_1_IWTP_site_location_171221.mxd



Lot Boundary

Site Location of Wastewater Treatment Plant

Figure 2-2	**Trility Pty Ltd**
Date: *10/05/2018*	Author: Personal **Map Scale:** 1:60,000
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C114943_Trility Pty Ltd\GIS\Agnes Water\143710-01_Sept_2017_QR\mxd\FIG_2_2_WwTP_site_location_171221.mxd

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. 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.**

Table 3-1 Integrated Water Treatment Plant Groundwater Monitoring Bores

Well Name	Easting	Northing	Depth of Well (m)	Relative Level (m)	Depth to Water (m)[1]	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

[1] 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 3-2 Wastewater Treatment Plant Groundwater Monitoring Bores

Well Name	Easting, MGA94	Northing, MGA94	Depth of Well (m)	Relative Level	Depth to Water (m)[1]	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

[1] As measured on 25 May 2016.

Lot Boundary
Groundwater Bore (Greencap May 2016)
Indicative Location of Treated Water Flush Point
Indicative Location of Brine Pipe
Indicative Location of Seawater Pipe

Location of IWTP Groundwater Bores

Figure 3-1

Trility Pty Ltd

Date: *9/07/2018*

Author: Personal

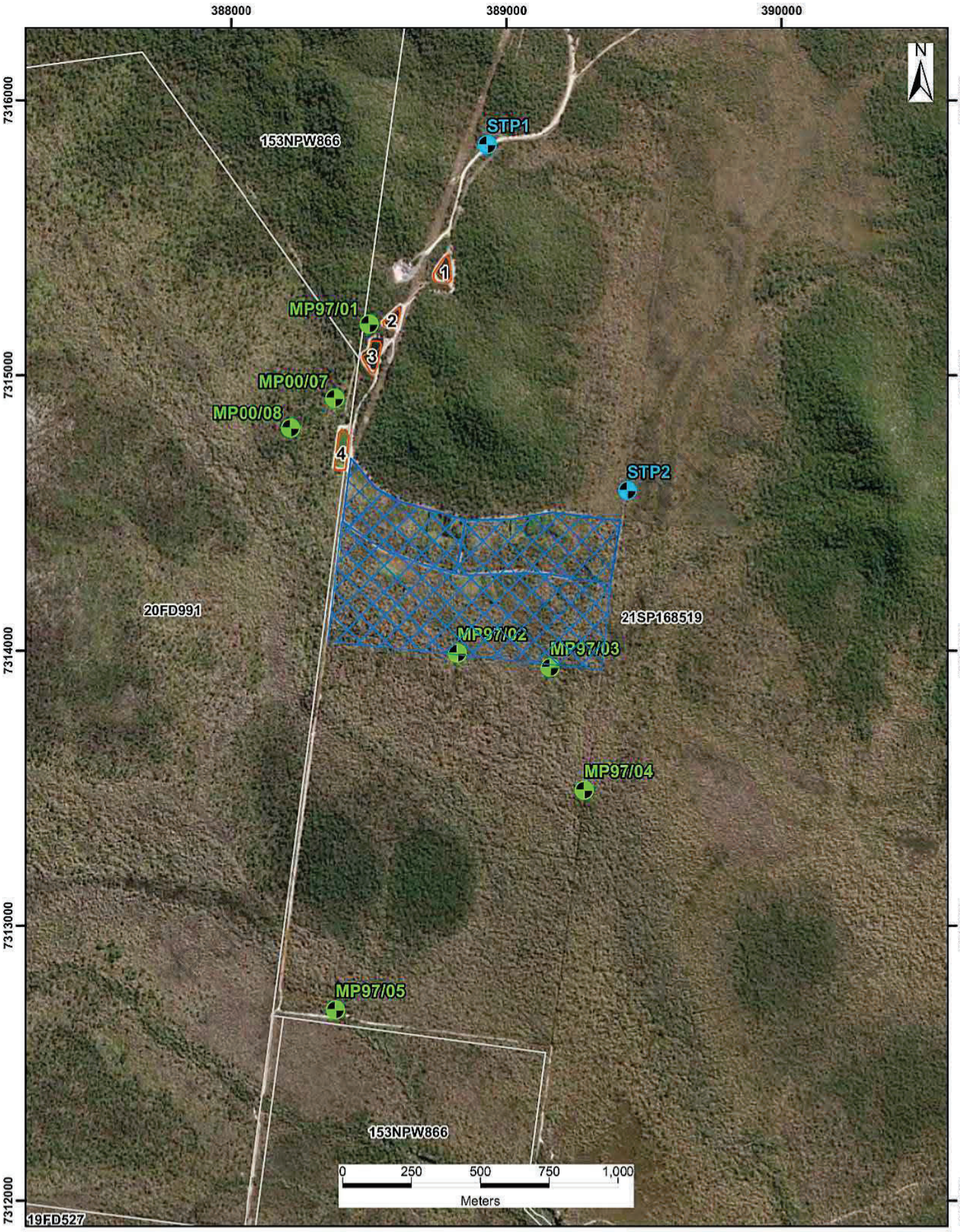
Map Scale: 1:1,200

Revision: R1

Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C114943_Trility Pty Ltd\GIS\Agnes Water\J143710-01-01-01_Mar_2018_QRmxd\FIG_3_1_IWTP_GW_bore_loc_180709.mxd



Lot Boundary
Lagoon
Recycled Water Irrigation Area

Groundwater Bore
Greencap (May 2016)
Previously Existing

Location of WwTP Groundwater Bores	
Figure 3-2	Trility Pty Ltd
Date: 6/08/2018	Author: Persona Map Scale: 1:16,000
Revision: R1	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C110943_Trility Pty Ltd\GIS\Agnes Water\Annual 2018\mxd\FIG_3_2_WwTP_GW_bore_loc_180808.mxd

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**.

Table 4-1 Monitoring Parameters and Trigger Values

Quality Characteristic	Units	Trigger Values
Dissolved Oxygen	mg/L	20% change from background[1]
Total Nitrogen	mg/L as Nitrogen	
Nitrate	mg/L as Nitrogen	
Ammonia	mg/L as Nitrogen	
Total Phosphorous	mg/L	
Chloride	mg/L	
Electrical Conductivity	uS/cm	
Sulphate	mg/L	No change from background[2]
Boron	mg/L	
pH	pH unit	
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 Guidelines
Dissolved Metals: (Al, Fe, Mn, As, Cd, Cr, Co, Cu, Pb, Hg, Ni, Se, Ag, Sn, Zn).	mg/L or ug/L	

[1] 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.

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 *E. Coli* and Enterococci)
MP97/03	Not sampled
MP97/04	December 2017
MP97/05	December 2017 (All parameters Except *E. Coli* and Enterococci)
MP00/07	Not sampled
MP00/08	Not sampled
DESAL1	September 2016
DESAL2	September 2016
DESAL3	September 2016

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 µm 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.

Table 6-1 Rainfall Data

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**

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 6-6and 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**.

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

Month	Groundwater Elevation (m AHD)[1]		
	DESAL1	DESAL2	DESAL3
July 2019	16.639	16.769	15.558
August 2019	16.535	16.723	15.512

Month	Groundwater Elevation (m AHD)[1]		
	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

[1] 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**.

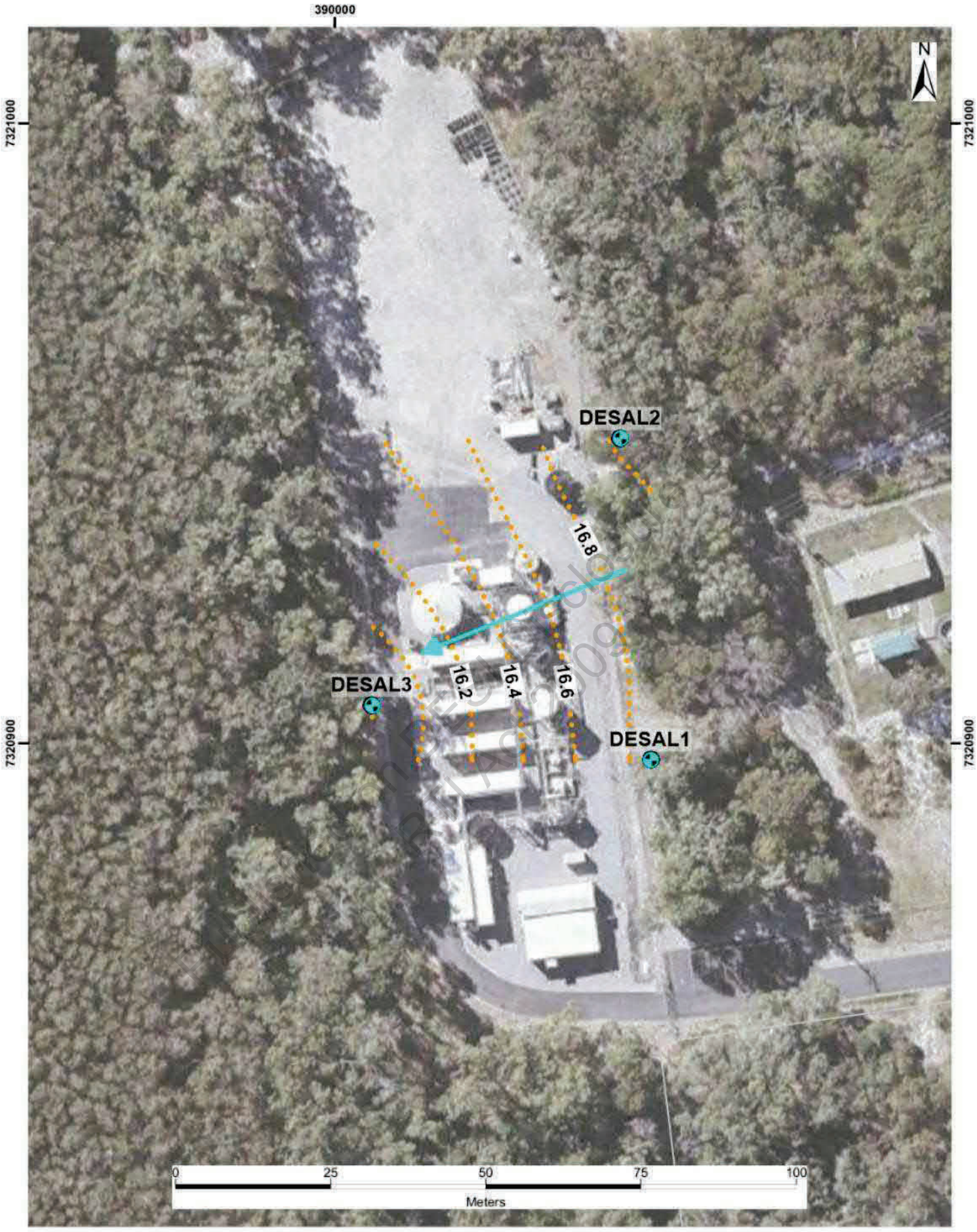
Table 6-3 Groundwater Gauging Data, WwTP July 2019 – June 2020

Month	Groundwater Elevation (m AHD)[1]								
	STP1	STP2	MP97/01	MP97/02	MP97/03	MP97/04	MP97/05	MP00/07	MP00/08
July 2019	29.243	6.888	Dry	Dry	Dry	Dry	Dry	Dry	Dry
August 2019	29.109	6.794	Dry	Dry	Dry	Dry	Dry	Dry	Dry
September 2019	29.013	6.685	Dry	Dry	Dry	Dry	Dry	Dry	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	Dry	Dry	Dry	Dry	Dry	Dry
January 2020	28.678	6.252	Dry	Dry	Dry	Dry	Dry	Dry	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

[1] 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:

- 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.



Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, April 2020	
Figure 6-1	Trility Pty Ltd
Date: 4/06/2020	Author: Personal
Revision: R1	Map Scale: 1:800
	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

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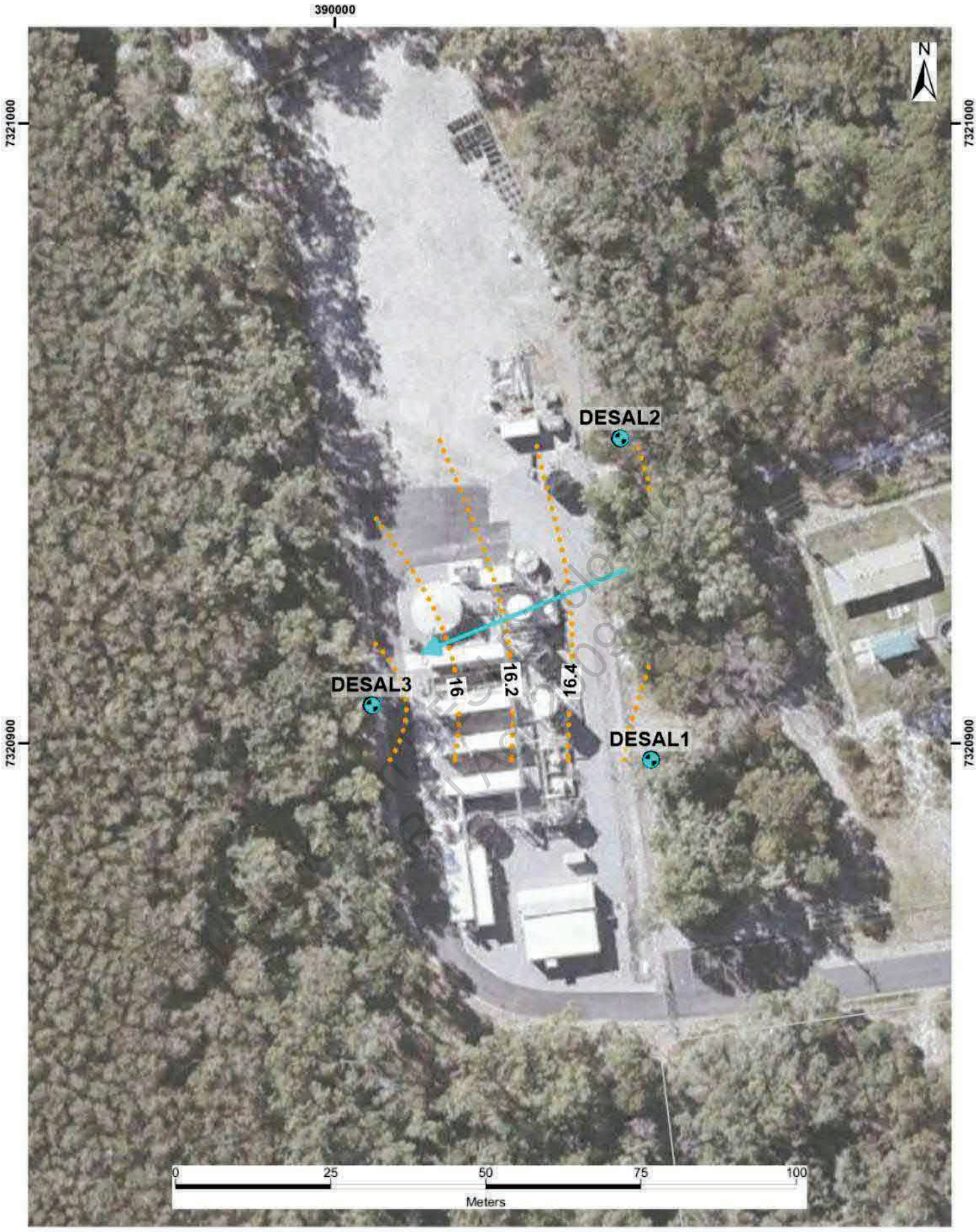

Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, May 2020	
Figure 6-2	**Trility Pty Ltd**
Date: *4/06/2020*	Author: Personal
Revision: R1	GREENCAP

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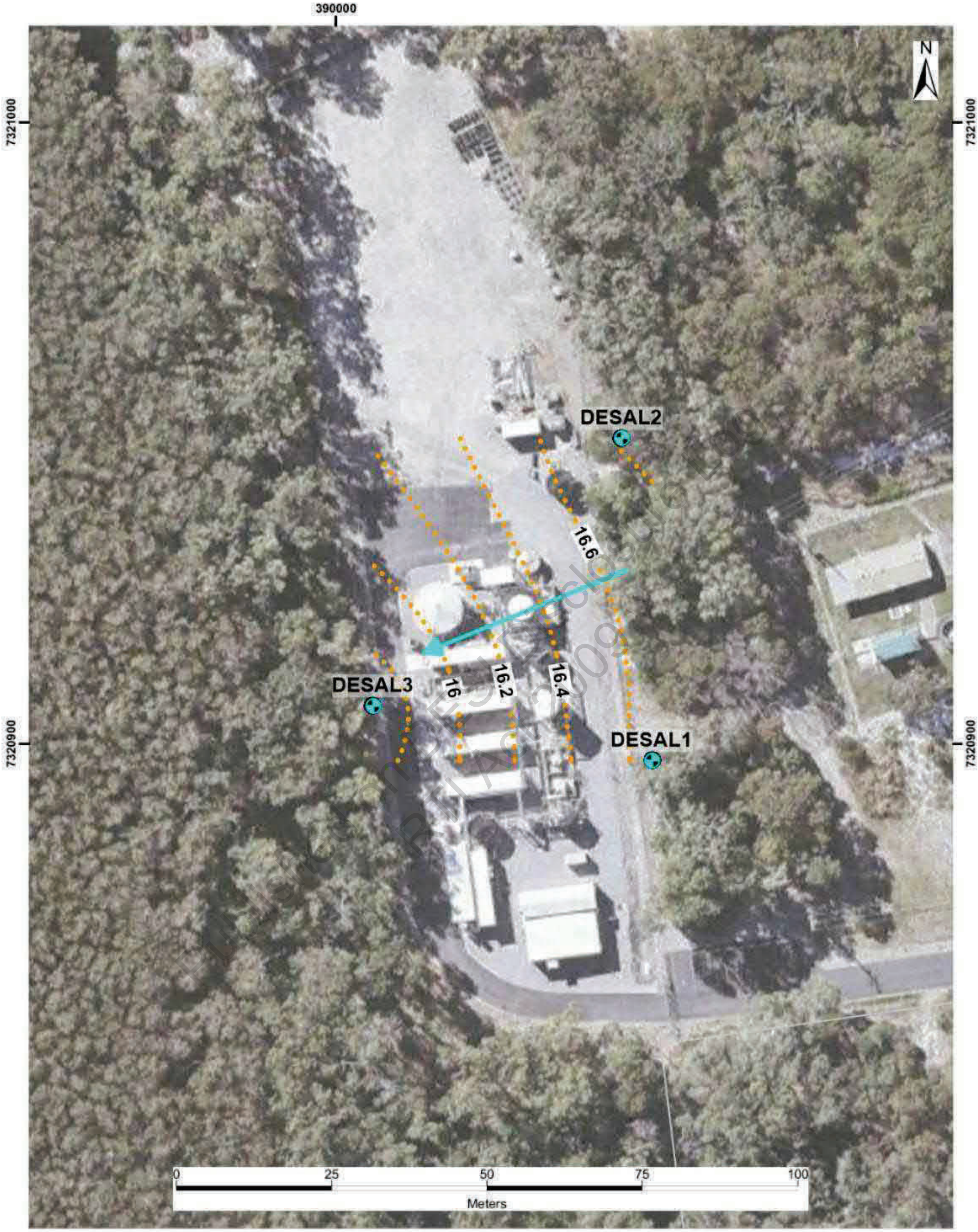


Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, June 2020

Figure 6-3

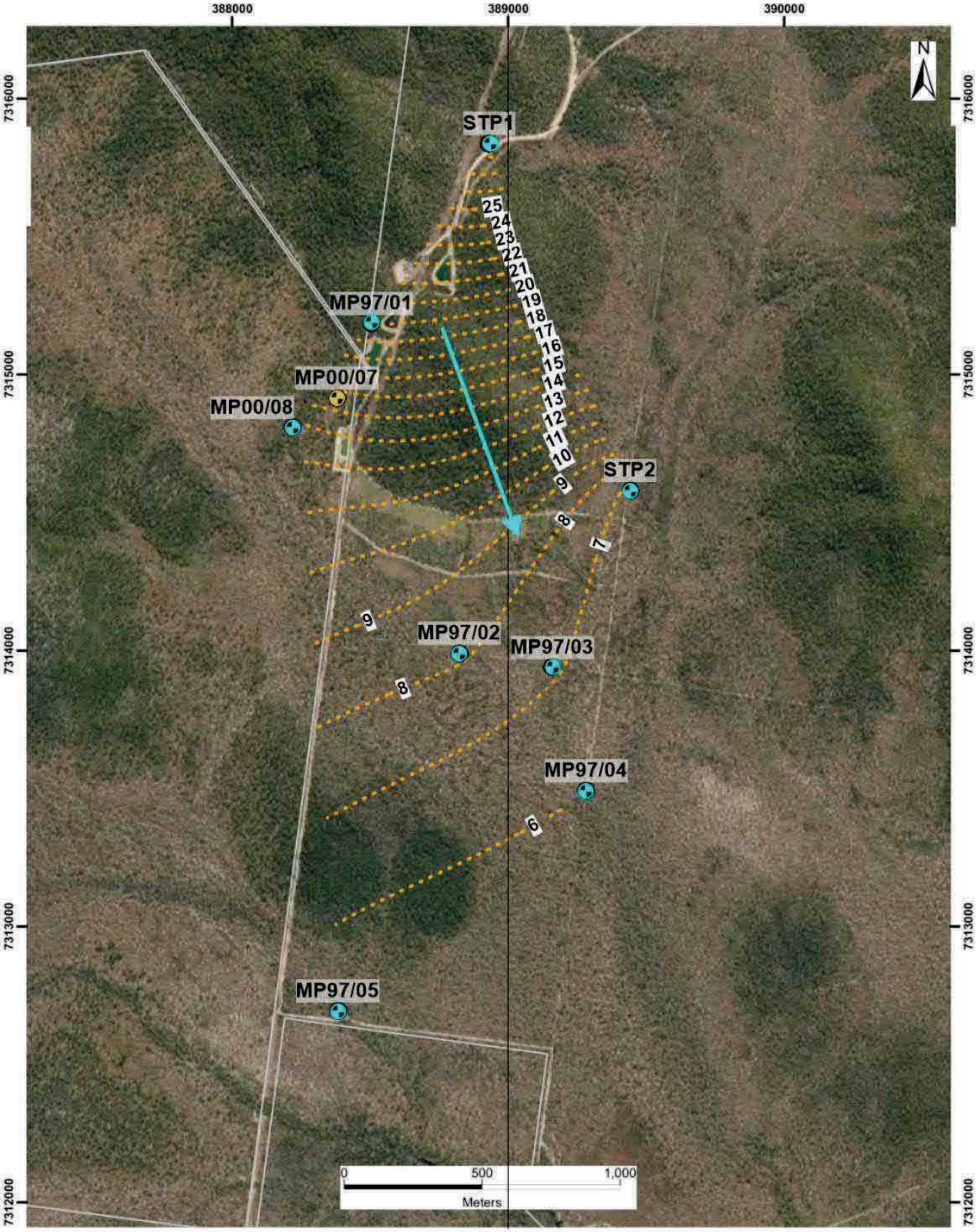
Trility Pty Ltd

Date: 4/06/2020

Author: Persona

GREENCAP

Persona



Lot Boundary

Groundwater Bore

Sampled

Dry

Inferred Groundwater Flow Direction

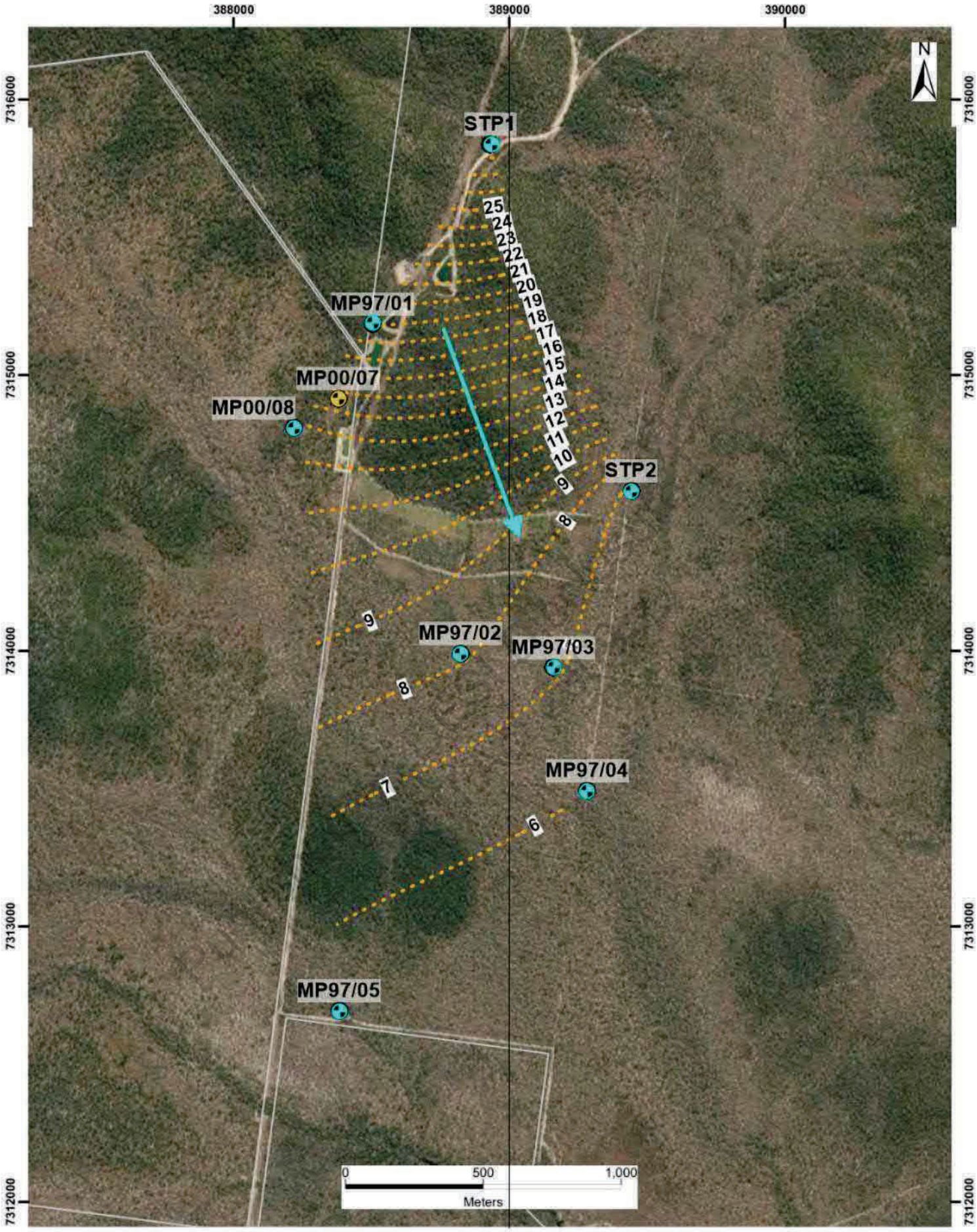
Groundwater Level Contours (mAHD)

WwTP Inferred Groundwater Flow Direction, April 2020

Figure 6-4	**Trility Pty Ltd**
Date: 4/06/2020	Author: Personal

GREENCAP

Personal



Lot Boundary

Groundwater Bore

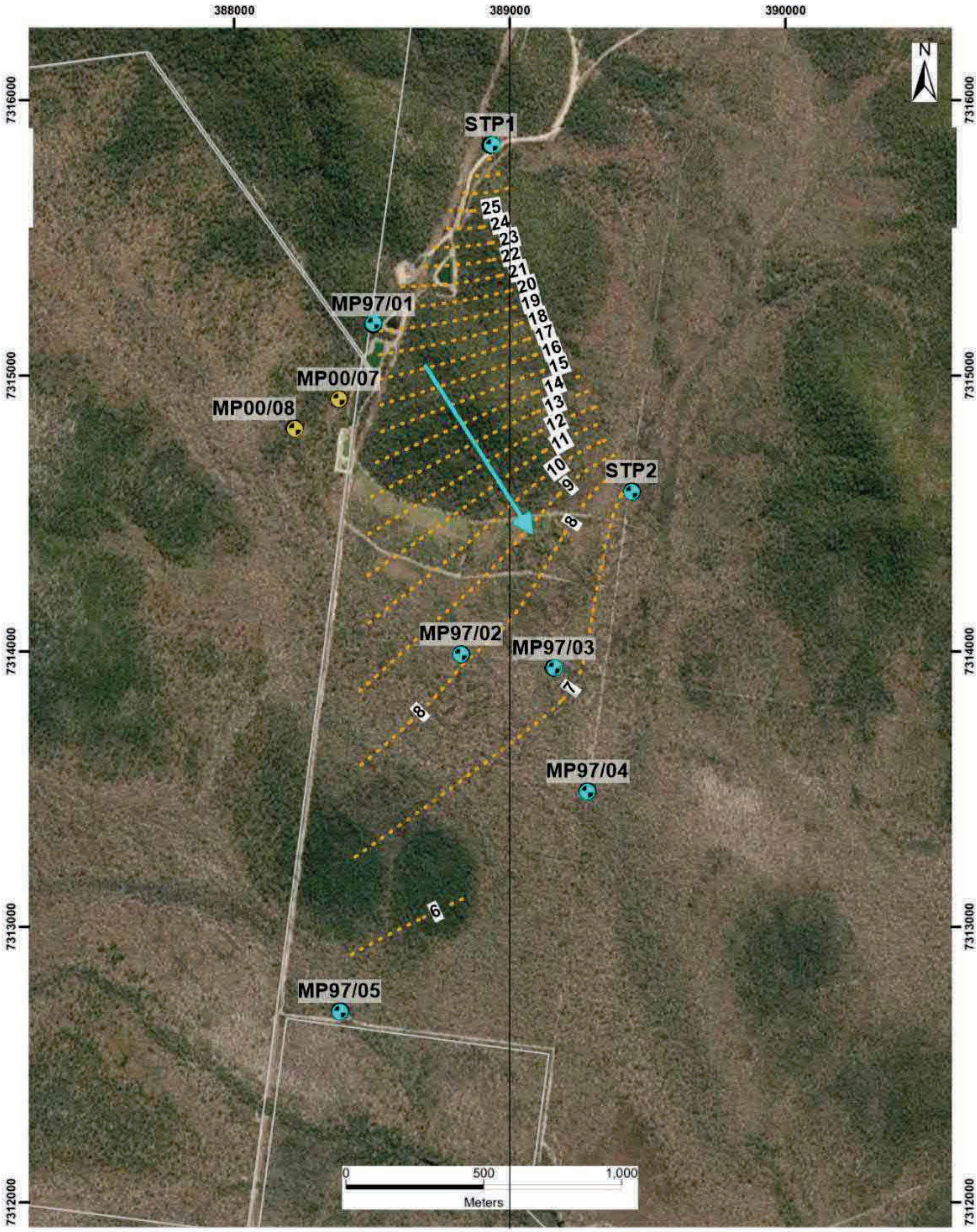
Sampled

Dry

Inferred Groundwater Flow Direction

Groundwater Level Contours (mAHD)

WwTP Inferred Groundwater Flow Direction, May 2020	
Figure 6-5	Trility Pty Ltd
Date: 4/06/2020	Author: [illegible]
Revision: R1	GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

Sampled

Dry

Groundwater Level Contours (mAHD)

WwTP Inferred Groundwater Flow Direction, June 2020		
Figure 6-6	**Trility Pty Ltd**	
Date: 4/06/2020	Author: Personal	GREENCAP

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

Monitoring locations	Physico-Chemical Parameters				
	pH [1] (pH Units)	EC [2] (µS/cm)	DO [2] (mg/L)	Temperature [3] (°C)	ORP [3] (mV)
WwTP					
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	

[1] The criteria for pH exceedance is any change from the background-derived trigger value,

[2] The criteria for dissolved oxygen and electrical conductivity exceedance is a 20% change down from the background value,

[3] 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 µS/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;

- 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

Parameter	Trigger Value	Bores Exceeding Trigger Value	Range of Reported Exceedances
Background WwTP Bores			
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			
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.

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

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

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.

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

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

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**.

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
EB2016548 (IWTP)	P	P	P	P	P
EB2016812 (WwTP)	P	P	P	P	P

P= Pass X = Fail - = not required * = refer to report text

Quality Assurance Criteria	Quality Control Criteria
Holding Times	**Accuracy**
Volatile Organic Carbons 14 days soil and water Semi Volatile Organic Carbons 7 days water, 14 days soil Metals 6 months, Mercury 28 days	Matrix spike, control sample: 70-130%, depending on analyte. Surrogate recovery: 50-150%, depending on analyte.
	Precision
	Method Blank: Not detected Duplicate: No limit (<10xLOR), 0-50% (10-20xLOR), 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 NATA-accredited 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 µg/L, Trigger Value – 0.06 µg/L) and selenium (LOR - 10 µg/L, Trigger Value – 5.0 µg/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.

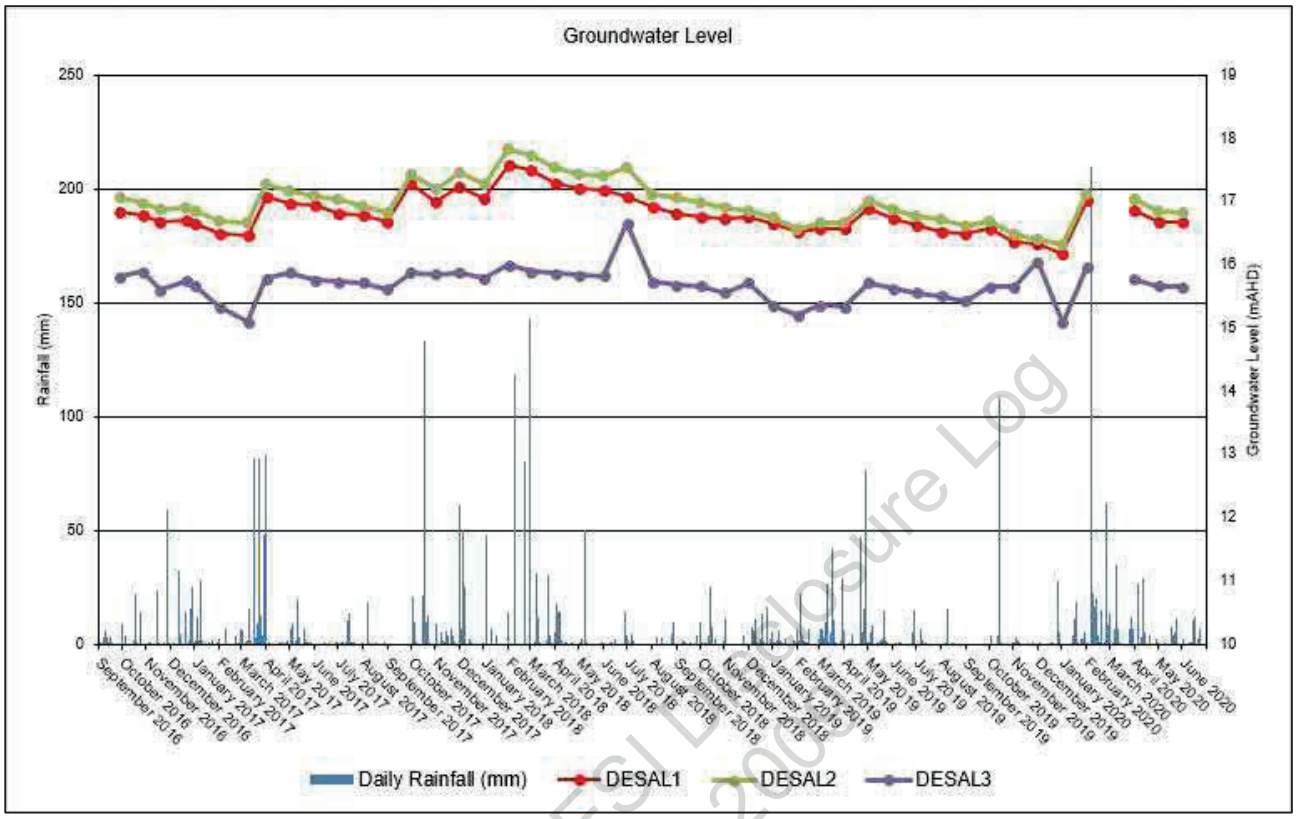


Figure 8-1 IWTP Groundwater Levels, September 2016 – June 2020

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.

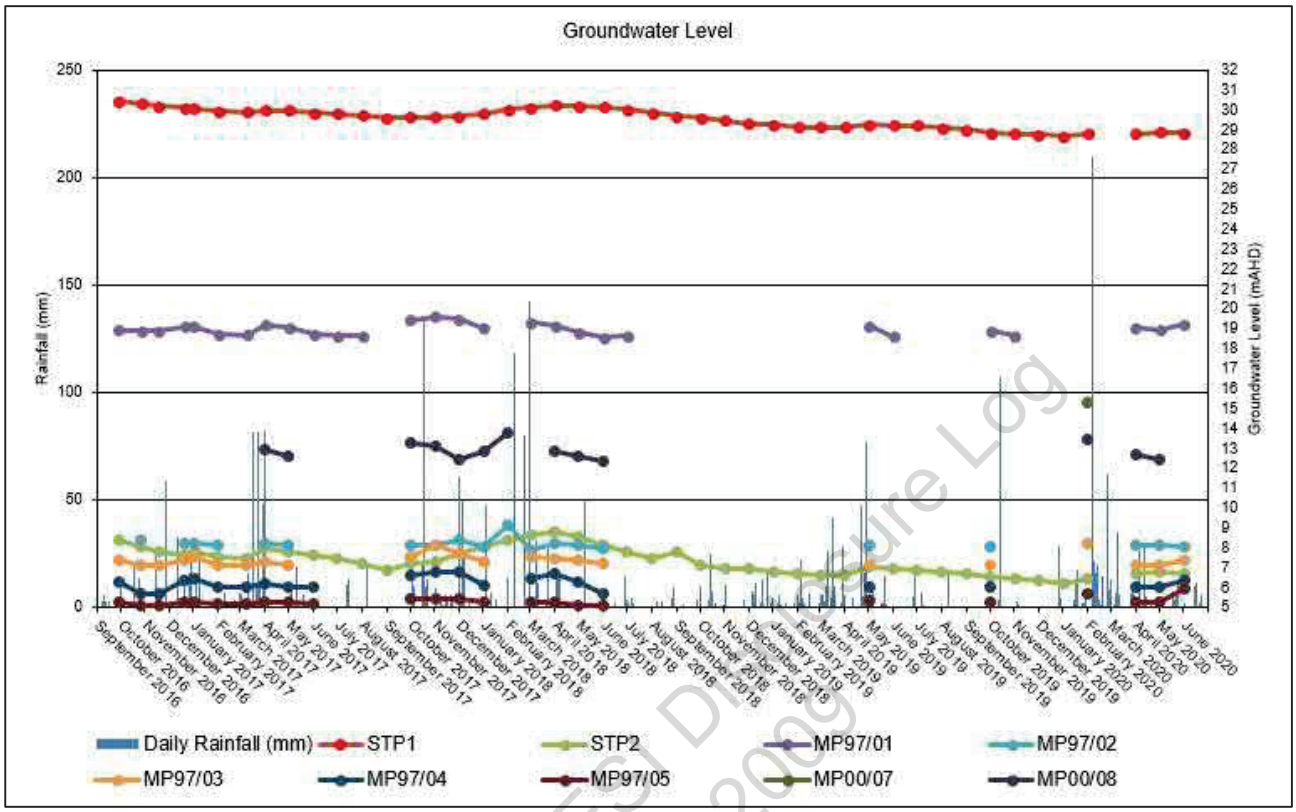


Figure 8-2 WwTP Groundwater Levels, September 2016 – June 2019

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 non-detect 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.

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 down-gradient 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.

Level 8 / 133 Mary Street
Brisbane QLD 4000
Australia

JUNE 2020
ANNUAL REPORT
Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

Appendix A: Groundwater Field Sampling Records

CHAIN OF CUSTODY

ALS Laboratory: please tick →

GLADSTONE 46 Callemoodah Drive Clinton QLD 4680
Ph: 07 4978 7944 E: ALSEnviro.gladstone@alsglobal.com

CLIENT: TRILITY	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR LABORATORY USE ONLY (Circle)
OFFICE: AGNES WATER		☐ Non Standard or urgent TAT (List due date):	Custody Seal Intact? Yes No N/A
PROJECT: GROUNDWATER MONITORING PROJECT NO.:	ALS QUOTE NO.: BN/222/16	COC SEQUENCE NUMBER (Circle)	Free ice / frozen ice bricks present upon receipt? Yes No N/A
ORDER NUMBER: PURCHASE ORDER NO.: 4500054738	COUNTRY OF ORIGIN:	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: 6) Personal inf	CONTACT PH: (07) 4974 7975	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: p4(6) Personal inform	SAMPLER MOBILE: p4(6) Personal inform	RELINQUISHED BY:	RECEIVED BY:
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 16.9.19 17.00	DATE/TIME:
Email Reports to : erson@TRILITY.com.au; awatergroup@trility.com.au		RELINQUISHED BY:	RECEIVED BY:
Email Invoice to (will default to PM if no other addresses are listed): accountspayable@trility.com.au		DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY	SAMPLE DETAILS MATRIX: Solid(S) Water(W)			CONTAINER INFORMATION		ANALYSIS REQUIRED including SUITES (NB. Suite Codes must be listed to attract suite price) Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle required).								Additional Information
LAB ID	SAMPLE ID	DATE / TIME	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TABLE 1	pH Field	Temp Field	D.O Field	Cond Field	ORP Field			Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
		16-9-19												
1	DESAL 1	9.15	W		5	X		23.4	0.13	239	306			
2	DESAL 2	10.00	W		5	X	3.60	23.0	0.15	217	334			
3	DESAL 3	10.40	W		5	X	4.74	25.0	0.15	227	-171.8			
4	DESAL 1 Dplicate	9.15	W		5	X	3.92	23.4	0.13	239	306			
				TOTAL	20									

Water Container Codes: P = Unpreserved Plastic; N = Nitric Preserved Plastic; ORC = Nitric Preserved ORC; SH = Sodium Hydroxide/Cd Preserved; S = Sodium Hydroxide Preserved Plastic; AG = Amber Glass Unpreserved; AP - Airfreight Unpreserved Plastic
V = VOA Vial HCl Preserved; VS = VOA Vial Sodium Bisulphate Preserved; VS = VOA Vial Sulfuric Preserved; AV = Airfreight Unpreserved Vial SG = Sulfuric Preserved Amber Glass; H = HCl preserved Plastic; HS = HCl preserved Speciation bottle; SP = Sulfuric Preserved Plastic; F = Formaldehyde Preserved Glass;
Z = Zinc Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine Preserved Bottles; STT = Sterile Sodium Thiosulfate Preserved Bottles

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client: Trility
Project: Groundwater bore installation and sampling
Location: Agnes Water, Qld
Job No: p4(6) Personal informa
Sampled b
Date: 16-9-19

Desc 1

WELL DETAILS			SAMPLING EQUIPMENT		
Well depth:	6.5 (m)		Sampling device: Peristaltic (low flow)	GEO#	✓
Well diameter:	50 mm		Water meter:	YSI#	✓
Casing type:	UC		Turbidity Meter:	TM#	
Initial water level:	2.677 (m)		Interphase probe:	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
8 45	2L	2L	2635	23.5	0.59	256.4	-	3.95	322	-
8.49	2L	4L	2638	23.4	0.57	249.0	-	3.92	317	-
8.53	2L	6L	2634	23.41	0.36	238.0	-	3.90	319	-
8.57	2L	8L	2634	23.41	0.18	240.5	-	3.93	313	-
9.01	2L	10L	2635	23.41	0.12	242.5	-	3.89	308	-
9.05	2L	12L	2635	23.4	0.11	238.6	-	3.92	308	-
9.09	2L	14L	2635	23.4	0.13	239.9	-	3.92	306	-
9.13	2L	16L	2635	23.4	0.13	239.4	-	3.92	306	-
			sample collected							
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather
fine, light winds, warm temperatures.

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour
Light tannin stained, low odour.

Samples Taken	Number	Duplicate: QA__	Triplicate: QA__	Order
Metals Plastic*				
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)				

MONITORING WELL VOLUMES:-

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

Field Technician #1

Field Technician #2

EENCAP
din Point
oundwater Sampling Record

GREENCAP

ent: Trility
ject: Groundwater bore installation and sampling
cation: Agnes Water, Qld

Job No:
Sampled by: 4(6) Personal infor
Date: 16-9-19

Desal 2

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	6.0 (m)	Sampling device: Peristaltic (low flow)	GEO# ✓
Well diameter:	50mm	Water meter:	YSI# PRO ✓
Casing type:	PVC	Turbidity Meter:	TM# ✗
Initial water level:	2949 (m)	Interphase probe:	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
9:30	2L	2L	2950	23.1	0.73	218	–	3.81	329	–
9:34	2L	4L	2951	23.0	0.61	217	–	3.70	352	–
9:38	2L	6L	2952	23.0	0.38	216	–	3.64	327	–
9:42	2L	8L	2951	23.0	0.31	215	–	3.64	339	–
9:46	2L	10L	2951	23.0	0.21	213	–	3.80	323	–
9:50	2L	12L	2951	23.0	0.19	213	–	3.62	337.6	–
9:54	2L	14L	2951	23.0	0.16	212	–	3.60	335	–
9:58	2L	16L	2951	23.0	0.15	212	–	3.60	334	–
			sample	collected						
sation Criteria (3 readings ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

observations: eg. Nearby activities, weather

fair light winds – warm temperatures

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

vations during Sampling:-
lours, sheens, turbidity, water colour

Light tannin stain.
Low odour.

Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Metals Plastic*				
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)

ORING WELL VOLUMES:-

ar of well casing:		mm	
ar of hole drilled:		mm	
me of casing only	0.000000	m3 (kL)	0.00 L per metre
me of drill-hole	0.000000	m3 (kL)	0.00 L per metre
me of annulus around casing	0.000000	m3 (kL)	0.00 L per metre
Bore Volume = 0.3*(3) + (1)	0.000000	m3 (kL)	0.0 L /m
ming 30% porosity in sand/gravel pack)			

chnician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client: Trility
Project: Groundwater bore installation and sampling
Location: Agnes Water, Qld

Job No:
Sampled by: 4(6) Personal inform
Date: 16-9-15

Desal 3

WELL DETAILS
Well depth: 50 (m)
Well diameter: 50mm
Casing type: PVC
Initial water level: 3306 (m)

SAMPLING EQUIPMENT
Sampling device: Peristaltic (low flow)
Water meter:
Turbidity Meter:
Interphase probe:
GEO#
YSI# PRO ✓
TM#
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
10:10	2L	2L	3640	24.9	0.13	211	–	4.71	-175.2	–
10:14	2L	4L	3645	24.9	0.13	212	–	4.73	-182.2	–
10:18	2L	6L	3650	24.9	0.13	213	–	4.71	-183	–
10:22	2L	8L	3650	24.9	0.14	215	–	4.74	-181	–
10:26	2L	10L	3650	24.9	0.13	217	–	4.75	-174	–
10:30	2L	12L	3650	25.0	0.13	218	–	4.73	-174.4	–
10:34	2L	14L	3650	24.9	0.14	223	–	4.74	-172.6	–
10:38	2L	16L	3650	25.0	0.15	222	–	4.74	-171.8	–
			sample collected							
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather
hot light winds

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour
light tannin stain
low odour.

Samples Taken	Number	Duplicate: QA__	Triplicate: QA_	Order
Metals Plastic*				
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:-

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
) Total Bore Volume = 0.3*(3) + (1) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.0 L /m

eld Technician #1

Field Technician #2

TRILITY

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
7-9-2016	1300	[redacted]	2210	2440	2985
27.9.2016	10:00		2275	2500	2992
18:10:2016	11.45		2324	2575	2845
15.11.2016	2.50pm		2440	2672	3142
14.12.2016.	0910am		2405	2650	2995
19.1.2017	0745		2461	2698	3072
27.2.2017	0230		2627	2860	3402
8.3.2017	0930		2650	2887	3642
18/4/2017	3.30pm		2051	2278	2953
14/5/2017	11:30am		2135	2372	2760
21-6-2017	9.30		2170	2470	2980
20-7-2017	15.40		2240	2510	2998
23-8-2017	8.10am		2317	2627	3017
27-9-2017	9.10 am		2425	2718	3120
26/10/2017	3pm		1825	2120	2554
20/11/2017	12pm		2120	2344	2892
14-12-17	8.50		1882	2085	2562
21.1.18	1:10pm		2065	2280	2950
27.2.18	8.30 a.m		1522	1728	2745
22.3.18	9.00 a.m		1607	1830	2846
27-4-18	3.30pm		1834	2023	2875
23-5-18	8:15		1912	2123	2896
4-6-18	9.00 a.m		1930	2150	2912
6-7-18	9.10 a.m.		2030	2023	2083
23.8.18	11.10 a.m		2210	2441	3001
19-9-18	9.00 am		2296	2498	3058
8-10-18	8.42 am		2350	2578	3072
29-11-18	13:06 pm		2370	2660	3175
18-12-18	9.00 a.m		2765	2692	3016
21-1-19	16:00 pm		2475	2810	3390
28-2-19	10:40 am		2587	2980	3535
25-3-19	9.00 am		2530	2882	3375
16-4-19	8.10 a.m		2547	2889	3401
27-5-19	12.30 p.m		2234	2552	3012
24-6-19	9.00 am		2380	2681	3100
31-7-2019	7.20 a.m		2478	2786	3181
16.8.19	5.30 am		2582	2832	3227
16.9.19	8.45 am		2627	2949	3306

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client: Trility
Project: Groundwater bore installation and sampling
Location: Agnes Water, Qld

Job No:
Sampled by: 6) Personal info
Date: 16-12-19

Desal 1

WELL DETAILS
Well depth: 6.5 (m)
Well diameter: 50 mm
Casing type: PVC
Initial water level: 2784 (m)

SAMPLING EQUIPMENT
Sampling device: Peristaltic (low flow) GEO# ✓ PRO
Water meter: YSI#
Turbidity Meter: TM#
Interphase probe: 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
9:00	2L	2L	2796	25.0	0.62	271	—	3.86	188	—
9:04	2L	4L	2794	25.1	0.73	273	—	3.88	215	—
9:08	2L	6L	2795	25.2	0.83	252	—	3.87	232	—
9:12	2L	8L	2795	25.2	0.52	281	—	3.86	241	—
9:16	2L	10L	2795	25.2	0.67	286	—	3.86	248	—
9:20	2L	12L	2795	25.2	0.87	279	—	3.86	248	—
9:24	2L	14L	2795	25.2	0.88	280	—	3.88	248	—
9:28	2L	16L	2795	25.2	0.88	278	—	3.89	248	—
				sample collected						
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather
NE winds Hot.

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour
low odour
Iron stained.

Samples Taken Metals Plastic*	Number	Duplicate QA	Triplicate QA	Order
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:		mm	
ameter 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
Total Bore Volume = 0.3*(3) + (1) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.0 L /m

ld Technician #1

Field Technician #2

:ENCAP
lin Point
undwater Sampling Record

GREENCAP

t: Trility
ct: Groundwater bore installation and sampling
tion: Agnes Water, Qld

Job No:
Sampled by: (6) Personal info
Date: 16-12-19

Desal 2

WELL DETAILS		SAMPLING EQUIPMENT		
Well depth:	60 (m)	Sampling device: Peristaltic (low flow)	GEO#	✓
Well diameter:	50mm	Water meter:	YSI#	✓ PRO
Casing type:	PVC	Turbidity Meter:	TM#	
Initial water level:	3140 (m)	Interphase probe:	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
9.40	2L	2L	3145	23.9	0.98	197	—	3.84	250	—
9.44	2L	4L	3145	23.9	1.02	197	—	3.84	250	—
9.48	2L	6L	3146	23.9	1.08	197	—	3.86	256	—
9.52	2L	8L	3146	23.9	0.91	195	—	3.84	281	—
9.56	2L	10L	3146	23.9	0.93	196	—	3.78	289	—
10.00	2L	12L	3146	23.9	0.97	192	—	3.71	292	—
10.04	2L	14L	3146	23.9	0.98	194	—	3.71	292	—
				sample collected						
ion Criteria (3 readings nges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

bservations: eg. Nearby activities, weather

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

NE winds
Hot
low to moderate odour.
low tannin stain.

Samples Taken	Number	Duplicate: QA	Triplicate: QA	Order
Metals Plastic*				
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)				

ING WELL VOLUMES:-

f well casing:		mm	
f hole drilled:		mm	
of casing only	0.000000	m3 (kL)	0.00 L per metre
of drill-hole	0.000000	m3 (kL)	0.00 L per metre
of annulus around casing	0.000000	m3 (kL)	0.00 L per metre
re Volume = 0.3*(3) + (1)	0.000000	m3 (kL)	0.0 L /m
g 30% porosity in sand/gravel pack)			

nician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	
Project:	Groundwater bore installation and sampling	Sampled by:	4(6) Personal infor
Location:	Agnes Water, Qld	Date:	16-12-19

Desal 3

WELL DETAILS		SAMPLING EQUIPMENT		
Well depth:	5.0 (m)	Sampling device: Peristaltic (low flow)	GEO#	✓
Well diameter:	50mm	Water meter:	YSI#	✓ PRO
Casing type:	PVC	Turbidity Meter:	TM#	
Initial water level:	3892 (m)	Interphase probe:	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
10:15	2	2L	2810	26.6	1.24	207	—	4.67	-123	—
10.19	2	4L	2817	26.7	1.28	208	—	4.67	-143	—
1023	2	6L	2820	26.6	1.48	209	—	4.67	-151	—
10.27	2	8L	2820	26.6	1.56	215	—	4.71	-154	—
10.31	2	10L	2820	26.6	1.51	208	—	4.73	-155	—
10.35	2	12L	2821	26.6	1.51	209	—	4.72	-155	—
				Sample collected.						
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather
fine NE winds, Hot.

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour
Iron stain, odorous

Samples Taken	Number	Duplicate QA	Triplicate QA	Order
Metals Plastic*				
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:		mm	
ameter 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
Total Bore Volume = 0.3*(3) + (1) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.0 L /m

ld Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	h4p4(6) Personal informati
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	15-4-2020

DESAL 1

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	6.5 (m)	Sampling device: Peristaltic (low flow)	GEO# ✓
Well diameter:	50 mm	Water meter:	YSI# ✓ PRO +
Casing type:	PVC	Turbidity Meter:	TM#
Initial water level:	2.243 (m)	Interphase probe:	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	233.1	
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		4.00	174.9	
12:03	2	20	2.252	26.3	0.32	298.7		3.99	172.4	
			SAMPLES TAKEN							
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

FINE, SLIGHT SOUTHERLY BREEZE

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

COLOUR BUT NOT TURBID.

Samples Taken	Number	Duplicte: QA__	Triplicate: QA__	Order
Metals Plastic*				
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)

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.0 L /m

Field Technician #1 **Field Technician #2**

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	ch4p4(6) Personal informatio
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	15-4-2020

DESAL 2

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	6.0 (m)	Sampling device: Peristaltic (low flow)	GEO# ✓
Well diameter:	50mm	Water meter:	YSI# ✓ PRO+
Casing type:	PVC	Turbidity Meter:	TM#
Initial water level:	2.523 (m)	Interphase probe:	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
10:10	2	2	2.530	24.7	0.24	292.2		4.16	135.0	
10:14	2	4	2.530	24.7	0.16	286.0		4.03	163.3	
10:18	2	6	2.532	24.8	0.16	304.0		3.99	186.2	
10:22	2	8	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	314.0		3.87	189.6	
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	311.7		3.91	186.2	
10:42	2	18	2.532	24.8	0.31	313.6		3.94	185.3	
10:46	2	20	2.532	24.8	0.31	313.6		3.92	180.6	
			SAMPLES	TAKEN						
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

FINE, SLIGHT SOUTHERLY BREEZE

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

TURBID

Samples Taken	Number	Duplicte: QA__	Triplicate: QA__	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.0 L /m

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	

DESAL 3

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	5.0 (m)	Sampling device: Peristaltic (low flow)	GEO# ✓ PRO+
Well diameter:	50mm	Water meter:	YSI#
Casing type:	PVC	Turbidity Meter:	TM#
Initial water level:	2.960 (m)	Interphase probe:	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
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	
0842	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		4.82	-167.2	
0850	2	12	3.360	27.7	0.42	207.9		4.82	-171.9	
0854	2	14	3.370	27.6	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		4.83	-177.8	
0906	2	20	3.386	27.7	0.43	212.3		4.82	-177.9	
0910	2	22	3.392	27.6	0.43	218.5		4.82	-177.7	
0914	2	24	3.396	27.6	0.44	219.0		4.82	-177.7	
			SAMPLES TAKEN							
Stabilisation Criteria (3 readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

FINE, SLIGHT SOUTHERLY BREEZE

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

DIRTY, TANNIN COLOURED, ODOUROUS

Samples Taken	Number	Duplicte: QA__	Triplicate: QA__	Order
Metals Plastic*				
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)

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.0 L /m

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	sch4p4(6) Personal information
Project:	Groundwater bore Installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	21-4-2020

STP 1

WELL DETAILS			SAMPLING EQUIPMENT		
Well depth:	15.36	(m)	Sampling device. Peristaltic (low flow)	GEO#	✓ PRO 7
Well diameter:	50mm		Water meter	YSI#	
Casing type:	PVC		Turbidity Meter	TM#	
Initial water level:	2.248	(m)	Interphase probe:	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
0936	2	2	2.375	24.2	0.39	3801		6.66	2.2	
0940	2	4	2.395	24.2	0.54	3764		6.64	2.8	
0944	2	6	2.428	24.2	0.65	3738		6.70	-6.7	
0948	2	8	2.448	24.1	0.66	3727		6.70	-9.9	
0952	2	10	2.468	24.1	0.68	3680		6.70	-13.2	
0956	2	12	2.484	24.2	0.70	3716		6.71	-15.4	
1000	2	14	2.495	24.1	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	24.1	0.72	3729		6.71	-16.7	
				SAMPLES TAKEN						
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

FINE, NO WIND, SUNNY

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

CLEAR, NO ODOUR

Samples Taken	Number	Duplicte: QA	Triplicate: QA	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

ch4p4(6) Personal informatio

Client:	Trility	Job No:	
Project:	Groundwater bore Installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	21-4-2020

STP 2

WELL DETAILS			SAMPLING EQUIPMENT	
Well depth:	13.14 (m)	Sampling device. Peristaltic (low flow)	GEO# ✓	
Well diameter:	50mm	Water meter	YSI# ✓	PRO +
Casing type:	PVC	Turbidity Meter	TM#	
Initial water level:	4.142 (m)	Interphase probe:	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
1051	2	2	4.512	24.1	0.62	11903		6.55	92.5	
1055	2	4	4.560	24.0	1.02	11786		6.54	89.7	
1059	2	6	4.565	24.0	1.07	11749		6.54	85.6	
1105	2	8	4.565	24.0	1.09	11656		6.53	86.3	
1109	2	10	4.565	24.0	1.10	11778		6.53	86.3	
1114	2	12	4.565	24.0	1.12	11640		6.53	85.9	
1118	2	14	4.565	24.0	1.13	11732		6.53	85.5	
			SAMPLES TAKEN							
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

FINE, NO WIND, SONNY

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

Observations during Sampling:-
eg. Odours, sheens, turbidity, water colour

CLEAR, NO ODOUR

Samples Taken	Number	Duplicte: QA_	Triplicate: QA_	Order
Metals Plastic*				
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)				

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) (assuming 30% porosity in sand/gravel pack)	0.000000	m3 (kL)	0.00 L per metre

Field Technician #1

Field Technician #2

TRILITY

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
7-9-2016	1300		2210	2440	2985
27.9.2016	10:00		2275	2500	2992
18.10.2016	11.45		2324	2575	2845
15.11.2016	2:50pm		2440	2672	3142
14.12.2016.	0910am		2405	2650	2995
19.1.2017	0745		2461	2698	3072
27.2.2017	0230		2627	2860	3402
8.3.2017	0930		2650	2889	3642
18/4/2017	3.30pm		2051	2278	2953
14/5/2017	11:30am		2135	2572	2960
21-6-2017	9.30		2170	2470	2980
20-7-2017	15.40		2240	2510	2998
23-8-2017	8.10 A.M		2317	2627	3017
27-9-2017	9.10 AM		2425	2718	3120
20/10/2017	3pm		1825	2120	2554
20/11/2017	12pm		2320	2344	2892
14.12.17	8.50		1882	2085	2562
21.1.18	1:10pm		2065	2280	2950
27.2.18	8.30 a.m		1522	1728	2745
22.3.18	9.00 A.M		1602	1830	2846
27-4-18	3.30pm		1834	2023	2875
23-5-18	8:15		1912	2123	2896
4-6-18	9.00 a.m		1930	2150	2912
6-7-18	9.10 a.m.		2030	2023	2083
23-8-18	11.10 a.m		2210	2441	3001
19-9-18	9.00 am		2296	2498	3058
8-10-18	8.42 AM		2350	2578	3072
29-11-18	13.06 pm		2370	2660	3175
18-12-18	9.00 A.M		2265	2692	3016
31-1-19	16.00 pm		2475	2810	3390
28-2-19	10:40 AM		2587	2980	3535
25-3-19	9.00 AM		2530	2882	3375
16-4-19	8.10 A.M		2547	2889	3401
27-5-19	1230 pm		2234	2552	3012
24-6-19	9.00 AM		2380	2681	3160
31-7-2019	7.20 A.M		2478	2786	3181
16.8.19	5.30 pm		2582	2832	3227
16.9.19	8.45 AM		2627	2949	3306
21.10.19	11.20 AM		2547	2851	3090
27.11.19	14.15 P.M.		2760	3065	3082
16-12-19	9.00 AM		2784	3140	2892
29.1.20	15:00 pm		2943	3244	3652
26.2.20	12:30 pm		2104	2445	2779
15-4-20	0830		2243	2523	2960
29-5-20	0830		2430	2695	3072
22-6-20	0950		2443	2735	3080