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:	23-6-2020

97/5

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	1.02 (m)	Sampling device. Peristaltic (low flow)	GEO# ✓
Well diameter:	50 mm	Water meter	YSI#
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	0.576 (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
1146	2	2	0.780							
1152	1.4	3.4	DRY							
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

Pumped dry at 3.4L & did not recover.

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

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

Client:	Trility	Job No:	[redacted]
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	23-6-2020

00/07

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	1.80 (m)	Sampling device. Peristaltic (low flow)	GEO# ✓
Well diameter:	50mm	Water meter	YSI#
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	DRY (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
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations; eg. Nearby activities, weather

WELL DRY

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

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

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:	23-6-2020

00/08

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	1.785 (m)	Sampling device: Peristaltic (low flow)	GEO#
Well diameter:	50mm	Water meter	YSI#
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	DRY (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
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

WELL DRY

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

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

Field Technician #1

Field Technician #2

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JUNE 2020
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Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

Appendix B-1: June 2020 Quarterly Results Summary Table

			Appendix B: Results Summary Table June 2020														
			Field					Inorganics									
			Dissolved Oxygen (DO)	Electrical Conductivity (EC)	pH	Oxidation Reduction Potential (O	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 S
			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
LOR								0.01	1	0.1	0.01	0.01	0.1	0.1	0.01	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
Sample ID	**Sampled Date**	**Lab_Report Number**														
STP1	24/06/2020	EB2016812	0.85	3,844	6.67		23.7	0.03	1,020	0.1	<0.01	<0.01	0.1	0.1	0.01	92
STP2	24/06/2020	EB2016812	0.49	12,069	6.5		26.3	0.03	3,850	0.3	<0.01	<0.01	0.4	0.4	0.07	369
STP1 Duplicate	24/06/2020	EB2016812	0.85	3,844	6.67		23.7	0.04	1020	0.1	<0.01	<0.01	0.1	<0.1	0.01	92
DESAL1	22/06/2020	EB2016548	0.18	343.1	4.1		24.5	0.12	77	1.1	0.3	<0.01	1.4	0.3	0.01	<1
DESAL2	22/06/2020	EB2016548	0.32	238.2	4.3		23.8	0.15	52	1	<0.01	<0.01	1	<0.1	0.14	<1
DESAL3	22/06/2020	EB2016548	0.34	202	5.07		26.3	0.47	47	1.2	<0.01	<0.01	1.2	<0.1	0.07	<1
DESAL 1 Duplicate	22/06/2020	EB2016548	0.18	343.1	4.1		24.5	0.13	78	1.1	<0.01	<0.01	1.4	0.31	0.01	<1

			Appendix B: Results Summary Table June 2020															
			Metals															
			Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
			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
LOR			10	10	1	1	50	0.1	0.1	1	1	1	1	1	1	50	50	1	1
		Trigger Criteria	**55**	**55**	**13**	**13**	**No change from background**	**0.2**	**0.2**	**1**	**1**	**1.4**	**1.4**	**1.4**	**1.4**			**3.4**	**3.4**
Sample ID	**Sampled Date**	**Lab_Report Number**																	
STP1	24/06/2020	EB2016812	<10	<10	1.0	1.0	<50	<0.1	<0.1	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,660	1,780	<1.0	<1.0
STP2	24/06/2020	EB2016812	<10	<10	2.0	2.0	<50	<0.1	<0.1	<1.0	<1.0	2.0	2.0	<1.0	<1.0	60	50	<1.0	<1.0
STP1 Duplicate	24/06/2020	EB2016812	<10	<10	1	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,630	1,760	<1.0	<1.0
DESAL1	22/06/2020	EB2016548	620	610	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	2.0	170	170	<1.0	<1.0
DESAL2	22/06/2020	EB2016548	620	590	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	0.001	2.0	760	740	<1.0	<1.0
DESAL3	22/06/2020	EB2016548	840	1,000	2	0.0	<50	<0.1	<0.1	3.0	3.0	<1.0	<1.0	<1.0	<1.0	3,000	3,000	<1.0	<1.0
DESAL 1 Duplicate	22/06/2020	EB2016548	0.61	1	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	160	170	<1.0	<1.0

			Appendix B: Results Summary Table June 2020															
			Metals														Microbiological	
			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	cfu/100 ml	cfu/100 ml
LOR			1	1	0.1	0.1	1	1	0.01	0.01	10	10	1	1	5	5	1	1
		Trigger Criteria	**1900**	**1900**	**0.06**	**0.06**	**11**	**11**	**0.05**	**0.05**	**5**	**5**			**8**	**8**	**No change from background**	**No change from background**
Sample ID	**Sampled Date**	**Lab_Report Number**																
STP1	24/06/2020	EB2016812	1,260	1,380	<0.1	<0.1	12.0	4.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	6.0	<1	<1
STP2	24/06/2020	EB2016812	121	116	<0.1	<0.1	3.0	4.0	0.02	0.02	<10	<10	<1.0	<1.0	17.0	<5.0	<1	<1
STP1 Duplicate	24/06/2020	EB2016812	1,280	1,380	<0.1	<0.1	<1.0	<1.0	<0.01	<0.1	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1
DESAL1	22/06/2020	EB2016548	13.0	14.0	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	7.0	<1	<1
DESAL2	22/06/2020	EB2016548	12.0	26.0	<0.1	<0.1	<1.0	1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	9.0	<1	<1
DESAL3	22/06/2020	EB2016548	23	26	<0.1	<0.1	2.0	2.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1
DESAL 1 Duplicate	22/06/2020	EB2016548	13	13	<0.1	<0.1	1.0	1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1

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Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

Appendix B-2: IWTP Annual Results Summary Table

			Appendix B: Results Summary Table July 2019 to June 2020														
			Field					Inorganics									
			Dissolved Oxygen (DO)[1]	Electrical Conductivity (EC)	pH[2]	Oxidation Reduction Potential (C	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 S
			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
			Dissolved Oxygen (DO) (mg/L)	Electrical Conductivity (EC) (µS/cm)	pH (pH_Units)	ion Reduction Potential (OR	Temperature (°C)	mmonia as N (mg/L	hloride (mg/L	jeldahl Nitrogen Total (mg/L	itrate (as N) (mg/L	itrite (as N) (mg/L	itrogen (Total) (mg/L	xides of Nitrogen (mg/L	otal Phosphorus as P (mg/L	ulphate as S (mg/L
Sample ID	Sampled Date	Lab_Report Number	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 S
DESAL 1	16/09/2019	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
DESAL 1	16/12/2019	EB1933892	0.88	278	3.89	248	25.2	0.14	72	0.8	0.02	<0.01	1	0.02	0.02	<1.0
DESAL 1	15/04/2020	EB2010399	0.32	298.7	3.99	172.4	26.3	0.1	74	1.2	0.76	<0.01	2	0.76	<0.05	<5.0
DESAL 1	24/06/2020	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
DESAL 2	16/09/2019	EB1924392	0.15	212	3.6	334	23	0.1	48	0.7	0.55	<0.01	1.2	0.55	0.01	1
DESAL 2	16/12/2019	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
DESAL 2	15/04/2020	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
DESAL 2	22/06/2020	EB2016548	0.32	238.2	4.3		23.8	0.15	52	1	<0.05	<0.05	1	<0.01	0.14	<5
DESAL 3	16/09/2019	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
DESAL 3	16/12/2019	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
DESAL 3	15/04/2020	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
DESAL 3	24/06/2020	EB2016548	0.34	202	5.07		26.3	0.47	47	1.2	<0.05	<0.05	1.2	<0.01	0.07	<5

Appendix B: Results Summary Table July 2019 to June 2020

			Metals																	
			Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
			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
			luminium (µg/L	luminium (Filtered) (µg/L	rsenic (µg/L	rsenic (Filtered) (µg/L	oron (µg/L	admium (µg/L	admium (Filtered) (µg/L	hromium (III+VI) (µg/L	hromium (III+VI) (Filtered) (µg/L	obalt (µg/L	obalt (Filtered) (µg/L	opper (µg/L	opper (Filtered) (µg/L	ron (µg/L	ron (Filtered) (µg/L	ead (µg/L	ead (Filtered) (µg/L
Sample ID	Sampled Date	Lab_Report Number	Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
DESAL 1	16/09/2019	EB1924392	420	420	<1.0	<1.0	50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	290	250	<1.0	<1
DESAL 1	16/12/2019	EB1933892	560	470	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	240	200	<1.0	<1.0
DESAL 1	15/04/2020	EB2010399	590	480	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	180	140	<1.0	<1.0
DESAL 1	24/06/2020	EB2016548	620	610	<0.001	<0.001	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	2	170	170	<1.0	<1.0
DESAL 2	16/09/2019	EB1924392	350	370	<1.0	<1.0	50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	350	330	<1.0	<1.0
DESAL 2	16/12/2019	EB1933892	510	450	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	460	390	<1.0	<1.0
DESAL 2	15/04/2020	EB2010399	1350	560	<1.0	<1.0	<50	<0.1	<0.1	3	<1.0	<1.0	<1.0	2	<1.0	670	570	1	<1.0
DESAL 2	22/06/2020	EB2016548	620	590	<0.001	<0.001	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	0.001	2	760	740	<1.0	<1.0
DESAL 3	16/09/2019	EB1924392	1030	800	1	1	<50	<0.1	<0.1	4	3	<1.0	<1.0	2	<1.0	4300	4280	<1.0	<1.0
DESAL 3	16/12/2019	EB1933892	870	1040	2	2	<50	<0.1	<0.1	3	3	<1.0	<1.0	<1.0	1	4290	3860	<1.0	1
DESAL 3	15/04/2020	EB2010399	920	730	1	1	<50	<0.1	<0.1	3	2	<1.0	<1.0	<1.0	<1.0	3990	3710	<1.0	<1.0
DESAL 3	24/06/2020	EB2016548	840	1000	0.002	0.002	<50	<0.1	<0.1	3	3	<1.0	<1.0	<1.0	<1.0	3000	3000	<1.0	<1.0

Appendix B: Results Summary Table July 2019 to June 2020

			Metals														Microbiological	
			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	cfu/100 ml	cfu/100 ml
			Manganese (µg/L	Manganese (Filtered) (µg/L	Mercury (µg/L	Mercury (Filtered) (µg/L	Nickel (µg/L	Nickel (Filtered) (µg/L	Silver (µg/L	Silver (Filtered) (µg/L	Selenium (µg/L	Selenium (Filtered) (µg/L	Tin (µg/L	Tin (Filtered) (µg/L	Zinc (µg/L)	Zinc (Filtered) (µg/L	E. Coli (cfu/100 ml)	Enterococci (cfu/100 ml)
Sample ID	Sampled Date	Lab_Report Number	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. Coli	Enterococci
DESAL 1	16/09/2019	EB1924392	7	7	<0.1	<0.1	<0.1	<1.0	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
DESAL 1	16/12/2019	EB1933892	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	15/04/2020	EB2010399	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	24/06/2020	EB2016548	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 2	16/09/2019	EB1924392	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	16/12/2019	EB1933892	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	15/04/2020	EB2010399	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	22/06/2020	EB2016548	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 3	16/09/2019	EB1924392	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	16/12/2019	EB1933892	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	15/04/2020	EB2010399	28	29	<0.1	<0.1	3	3	0.02	<0.01	<10	<10	<1.0	<1.0	6	8	<1	<1
DESAL 3	24/06/2020	EB2016548	23	26	<0.1	<0.1	2	2	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5	<1	<1

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JUNE 2020
ANNUAL REPORT
Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

Appendix B-3: WwTP Annual Results Summary Table

Appendix B: Results Summary Table July 2019 to June 2020

			Field					Inorganics								
			Dissolved Oxygen (DO)[1]	Electrical Conductivity (EC)	pH[2]	Oxidation Reduction Potential (C	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 S
			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
			Dissolved Oxygen (DO) (mg/L)	Electrical Conductivity (EC) (µS/cm)	pH (pH_Units)	ion Reduction Potential (OF	Temperature (°C)	mmonia as N (mg/l	hloride (mg/l	jeldahl Nitrogen Total (mg/l	itrate (as N) (mg/l	itrite (as N) (mg/l	itrogen (Total) (mg/l	xides of Nitrogen (mg/l	otal Phosphorus as P (mg/l	ulphate as S (mg/l
Sample ID	Sampled Date	Lab_Report Number	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 S
STP1	17/09/2019	EB1924565	0.25	3,848	6.68	10.7	23.5	0.05	1,030	<0.1	<0.1	<0.1	<0.1	<0.1	0.01	95
STP1	17/12/2019	EB1934065	2.64	3,648	6.54	2.1	24	0.05	1,020	<0.1	<0.01	<0.01	<0.1	<0.01	0.01	96
STP1	15/04/2020	EB2010933	0.72	3,729	6.71	-16.7	24.1	0.25	1,020	0.3	<0.01	<0.01	0.3	<0.01	0.02	95
STP1	24/06/2020	EB2016812	0.85	3,844	6.67		23.7	0.03	1,020	0.1	<0.01	<0.01	0.1	0.1	0.01	92
STP2	17/09/2019	EB1924565	0.83	12,364	6.5	121	23.3	0.04	3,940	<0.1	<0.1	<0.1	<0.1	<0.1	0.02	375
STP2	17/12/2019	EB1934065	3.24	11,708	6.35	111	23.5	0.01	4,020	<0.1	<0.01	<0.01	<0.1	<0.01	0.02	381
STP2	15/04/2020	EB2010933	1.13	11,732	6.53	85.5	24	0.18	3,850	0.3	<0.01	<0.01	0.3	<0.01	0.04	369
STP2	24/06/2020	EB2016812	0.49	12,069	5.07		26.3	0.03	3,850	0.3	<0.01	<0.01	0.4	0.4	0.07	369

			Appendix B: Results Summary Table July 2019 to June 2020																	
			Metals																	
			Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
			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
			luminium (µg/L	luminium (Filtered) (µg/L	rsenic (µg/L	rsenic (Filtered) (µg/L	oron (µg/L	admium (µg/L	admium (Filtered) (µg/L	hromium (III+VI) (µg/L	hromium (III+VI) (Filtered) (µg/L	obalt (µg/L	obalt (Filtered) (µg/L	opper (µg/L	opper (Filtered) (µg/L	ron (µg/L	ron (Filtered) (µg/L	ead (µg/L	ead (Filtered) (µg/L
Sample ID	Sampled Date	Lab_Report Number	Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
STP1	17/09/2019	EB1924565	<10	<10	1.0	1.0	80	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,680	1,670	<1.0	<1.0
STP1	17/12/2019	EB1934065	10	<10	1.0	1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,830	1,610	<1.0	<1.0
STP1	15/04/2020	EB2010933	<10	<10	1.0	1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,820	1,570	<1.0	<1.0
STP1	24/06/2020	EB2016812	<10	<10	1.0	1.0	<50	<0.1	<0.1	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,660	1,780	<1.0	<1.0
STP2	17/09/2019	EB1924565	<10	<10	1.0	1.0	<50	<0.1	<0.1	<1.0	<1.0	1.0	1.0	<1.0	<1.0	<50	<50	<1.0	<1.0
STP2	17/12/2019	EB1934065	10	<10	1.0	1.0	60	<0.1	<0.1	<1.0	<1.0	1.0	1.0	<1.0	<1.0	<50	<50	<1.0	<1.0
STP2	15/04/2020	EB2010933	<10	<10	1.0	2.0	<50	<0.1	<0.1	<1.0	<1.0	1.0	2.0	<1.0	<1.0	<50	<50	<1.0	<1.0
STP2	24/06/2020	EB2016812	<10	<10	2.0	2.0	<50	<0.1	<0.1	<1.0	<1.0	2.0	2.0	<1.0	<1.0	60	50	<1.0	<1.0

Appendix B: Results Summary Table July 2019 to June 2020

			Metals															Microbiological	
			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	cfu/100 ml	cfu/100 ml
			Manganese (µg/L)	Manganese (Filtered) (µg/L)	Mercury (µg/L)	Mercury (Filtered) (µg/L)	Nickel (µg/L)	Nickel (Filtered) (µg/L)	Silver (µg/L)	Silver (Filtered) (µg/L)	Selenium (µg/L)	Selenium (Filtered) (µg/L)	Tin (µg/L)	Tin (Filtered) (µg/L)	Zinc (µg/L)	Zinc (Filtered) (µg/L)	E. Coli (cfu/100 ml)	Enterococci (cfu/100 ml)
Sample ID	Sampled Date	Lab Report Number	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. Coli	Enterococci
STP1	17/09/2019	EB1924565	1,340	1,310	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP1	17/12/2019	EB1934065	1,350	1,260	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP1	15/04/2020	EB2010933	1,390	1,240	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1
STP1	24/06/2020	EB2016812	1,260	1,380	<0.1	<0.1	12.0	4.0	<0.01	<0.01	<10	<10	<10	<1.0	<5.0	6.0	<1	<1
STP2	17/09/2019	EB1924565	111	126	<0.1	<0.1	3.0	2.0	0.03	0.03	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP2	17/12/2019	EB1934065	109	105	<0.1	<0.1	2.0	2.0	0.03	0.02	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP2	15/04/2020	EB2010933	113	111	<0.1	<0.1	3.0	3.0	0.02	0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1
STP2	24/06/2020	EB2016812	121	116	<0.1	<0.1	3.0	4.0	0.02	0.02	<10	<10	<10	<1.0	17	<5.0	<1	<1

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JUNE 2020
ANNUAL REPORT
Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

Appendix D: Groundwater Contours

Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, July 2019

Figure D-1	**Trility Pty Ltd**
Date: *15/10/2019*	Author: Personal
	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 Inferred Groundwater Flow Direction, August 2019

Figure D-2	**Trility Pty Ltd**
Date: *15/10/2019*	**Author:** Personal
Revision: R1	**Map Scale:** 1:800
	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

Lot Boundary

Groundwater Bore

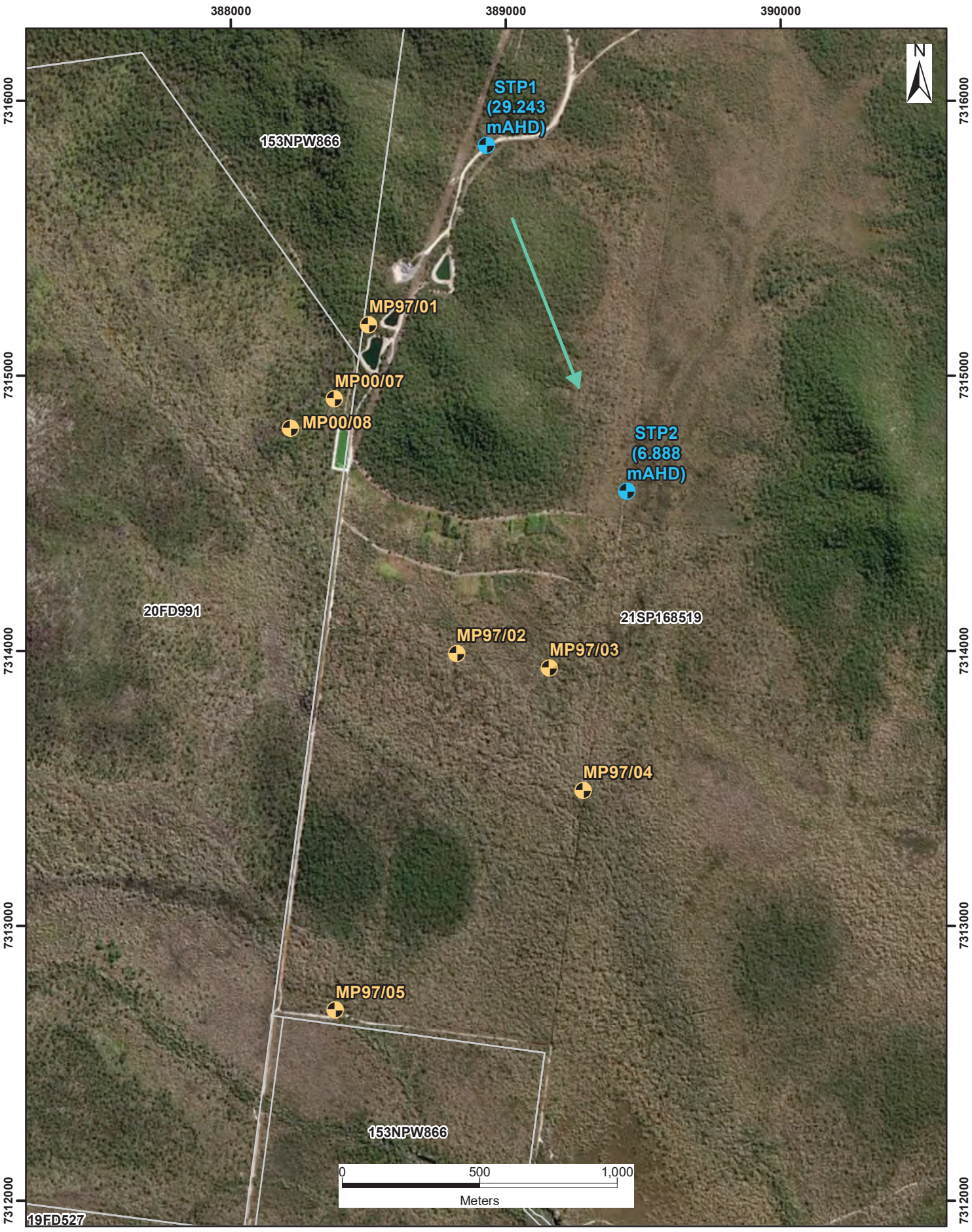
Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, September 2019	
Figure D-3	**Trility Pty Ltd**
Date: *15/10/2019*	**Author:** Personal **Map Scale:** 1:800
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

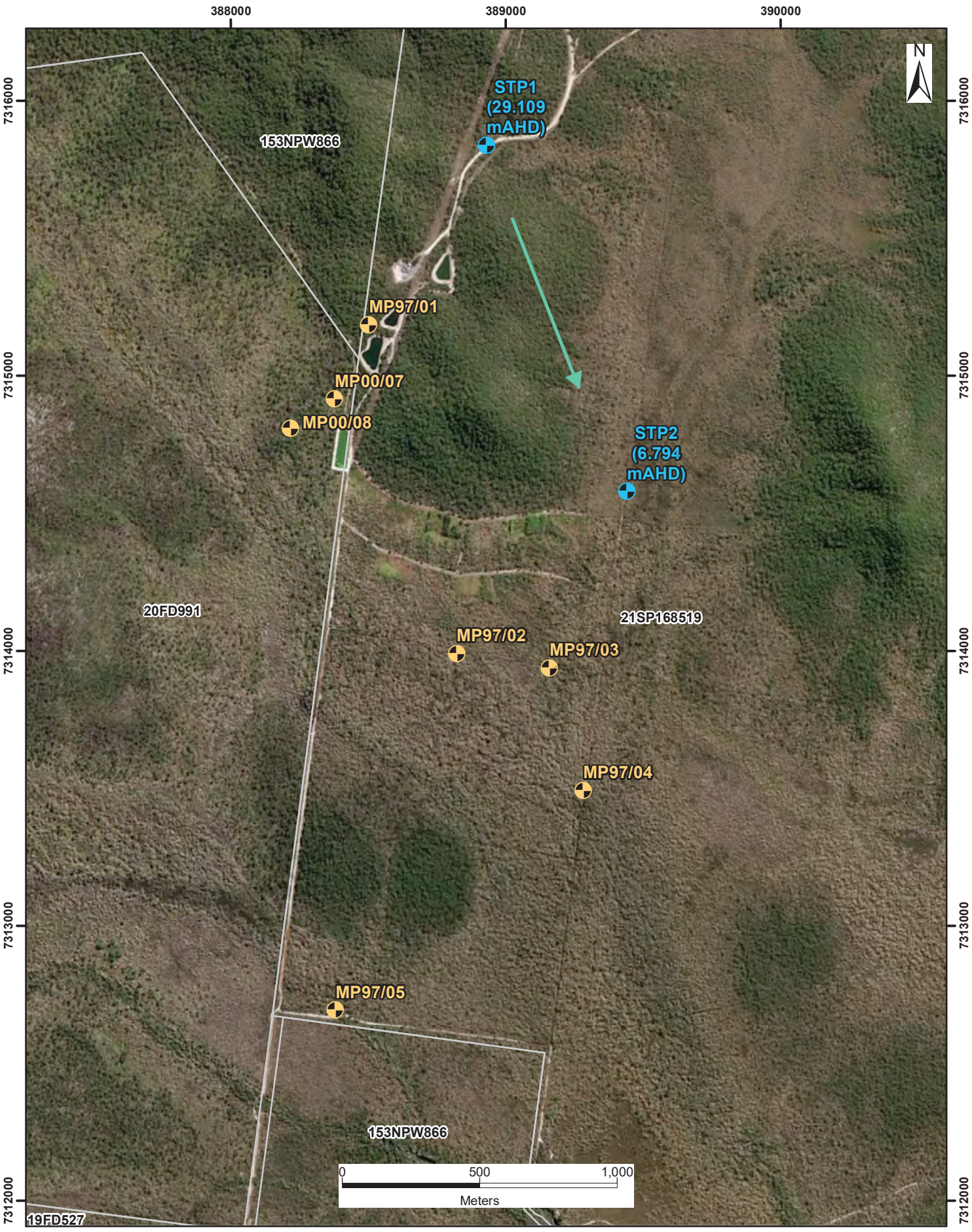
Sampled

Dry

WwTP Inferred Groundwater Flow Direction, July 2019

Figure D-4	Trility Pty Ltd
Date: 14/10/2019	Author: Personal Map Scale: 1:18,000
Revision: R1	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

Sampled

Dry

WwTP Inferred Groundwater Flow Direction, August 2019

Figure D-5

Date: *14/10/2019*

Trility Pty Ltd

Author: Personal

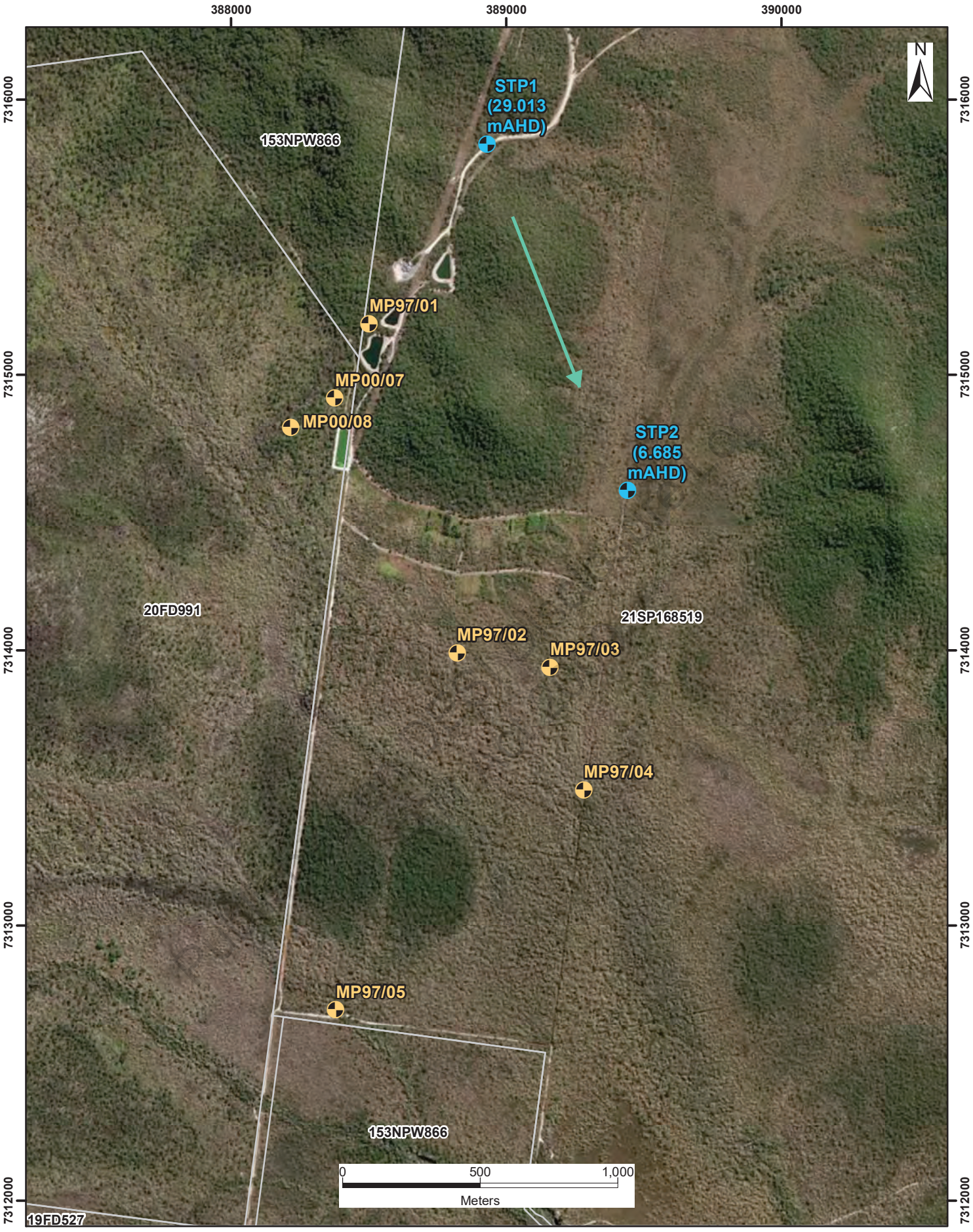
Map Scale: 1:18,000

Revision: R1

Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C114943_Trility Pty Ltd\GIS\Agnes Water\J163599-01_Sept_2019_QR\mxd\FIG_6_5_WwTP_GW_Level_08_2019_191014.mxd



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

Sampled

Dry

WwTP Inferred Groundwater Flow Direction, September 2019

Figure D-6

Trility Pty Ltd

Date: 14/10/2019

Author: Personal

Map Scale: 1:18,000

Revision: R1

Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C114943_Trility Pty Ltd\GIS\Agnes Water\J163599-01_Sept_2019_QR\mxd\FIG_6_6_WwTP_GW_Level_09_2019_191014.mxd

Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, October 2019

Figure D-7

Trility Pty Ltd

Date: 15/01/2020

Author: Personal

Map Scale: 1:800

Revision: R1

Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

\\ser2bne1\GIS_Projects\C114943_Trility Pty Ltd\GIS\Agnes Water\J163599-02_Dec_2019_QR\mxd\FIG_6_1_IWTP_GW_Level_10_2019_200115.mxd

Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, November 2019

Figure D-8	**Trility Pty Ltd**
Date: *15/01/2020*	**Author:** Personal Information **Map Scale:** 1:800
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP

Lot Boundary

Groundwater Bore

Greencap (May 2016)

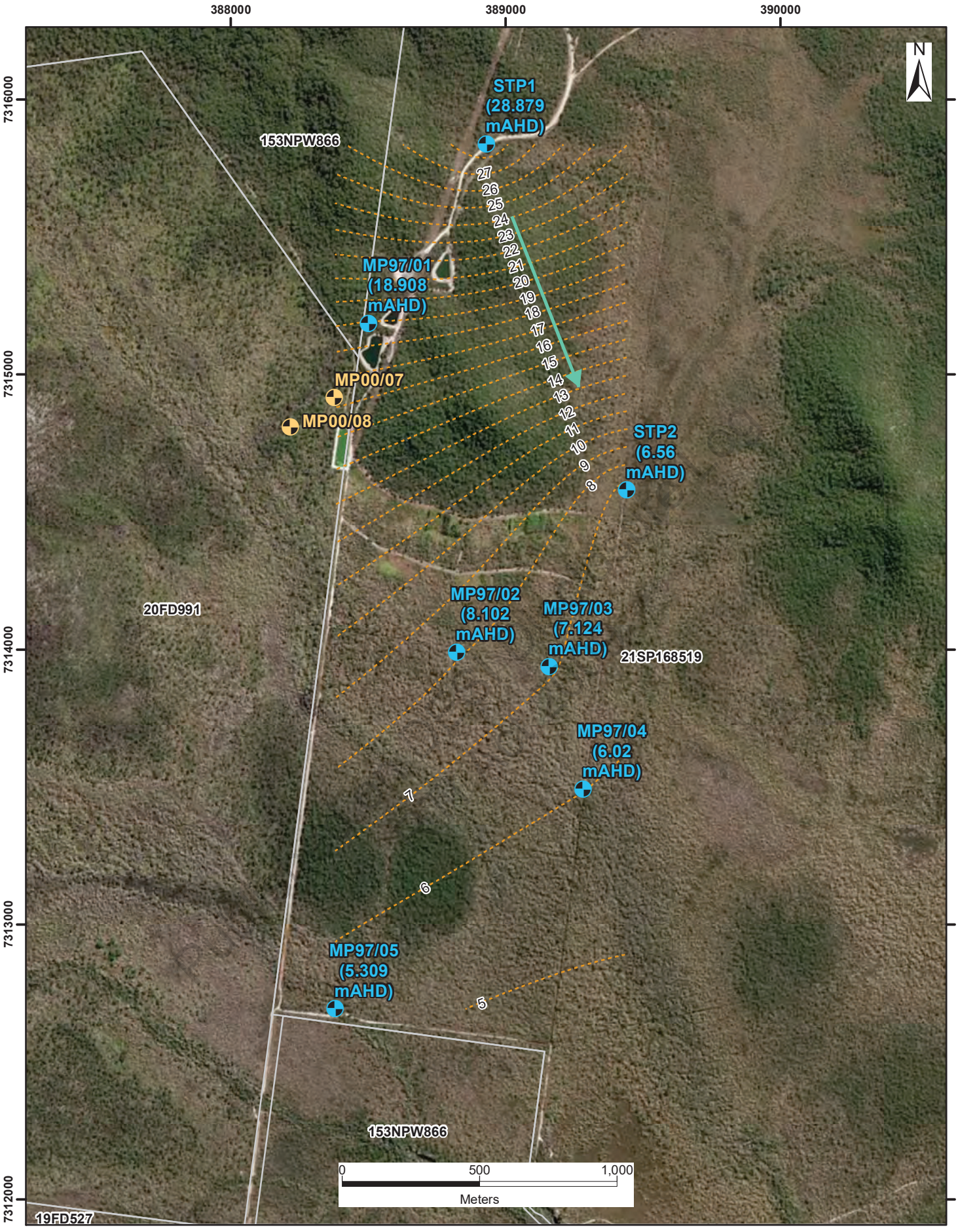
Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, December 2019

Figure D-9	**Trility Pty Ltd**
Date: *15/01/2020*	**Author:** Personal I
Revision: R1	**Map Scale:** 1:800
	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

Sampled

Dry

WwTP Inferred Groundwater Flow Direction, October 2019

Figure D-10

Trility Pty Ltd

Date: *16/01/2020*

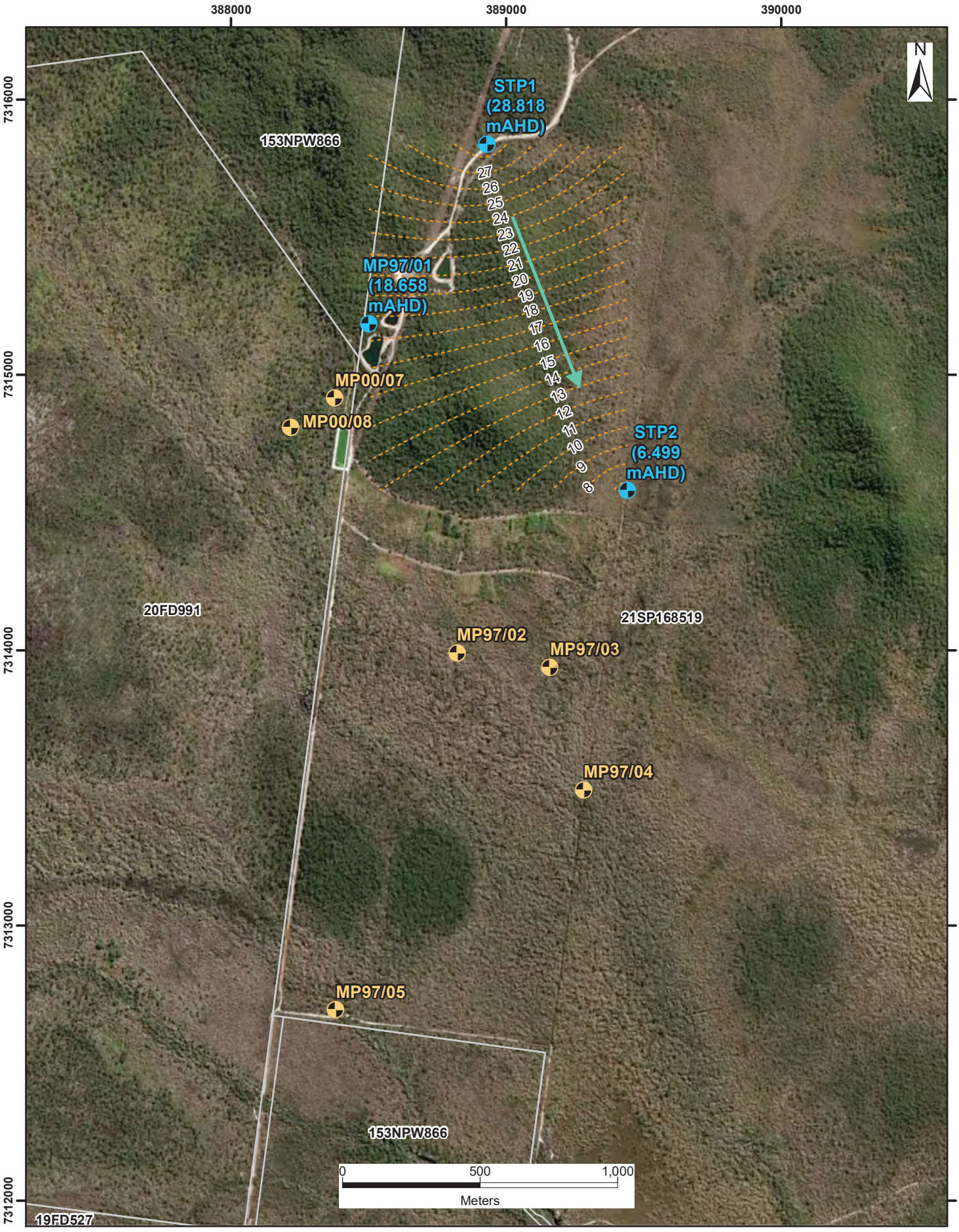
Author: Personal

Map Scale: 1:18,000

Revision: R1

Coordinate System: GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

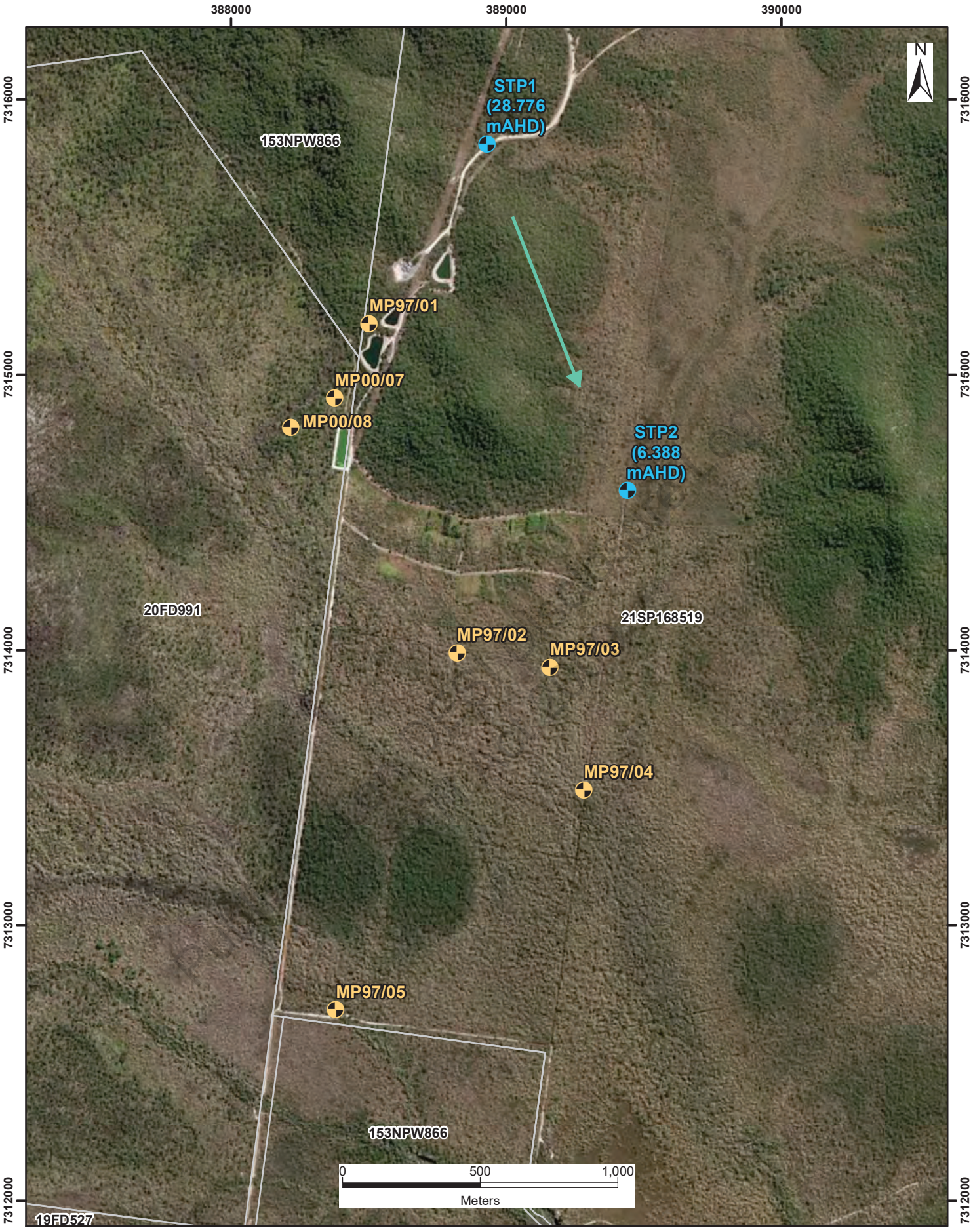
Groundwater Bore

Sampled

Dry

WwTP Inferred Groundwater Flow Direction, November 2019	
Figure D-11	**Trility Pty Ltd**
Date: *16/01/2020*	**Author:** Personal
	Map Scale: 1:18,000
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

Sampled

Dry

WwTP Inferred Groundwater Flow Direction, December 2019

Figure D-12

Trility Pty Ltd

Date: 16/01/2020

Author: Personal

Map Scale: 1:18,000

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 Inferred Groundwater Flow Direction, January 2020

Figure D-13	**Trility Pty Ltd**
Date: *4/06/2020*	**Author:** Personal
Revision: R1	**Map Scale:** 1:800
	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

Lot Boundary

Groundwater Bore

Greencap (May 2016)

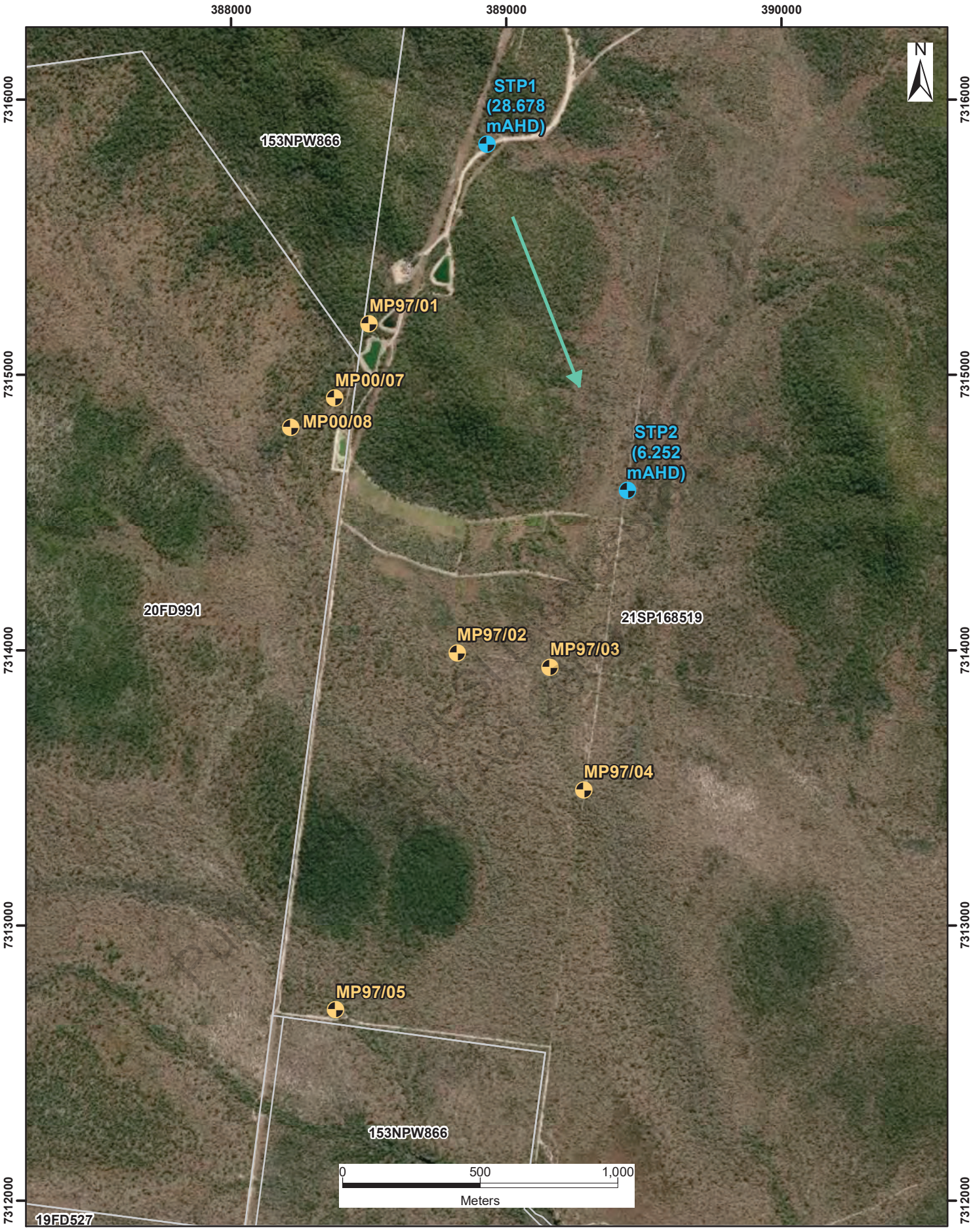
Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, February 2020

Figure D-14	**Trility Pty Ltd**
Date: *4/06/2020*	Author: Personal
	Map Scale: 1:800
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

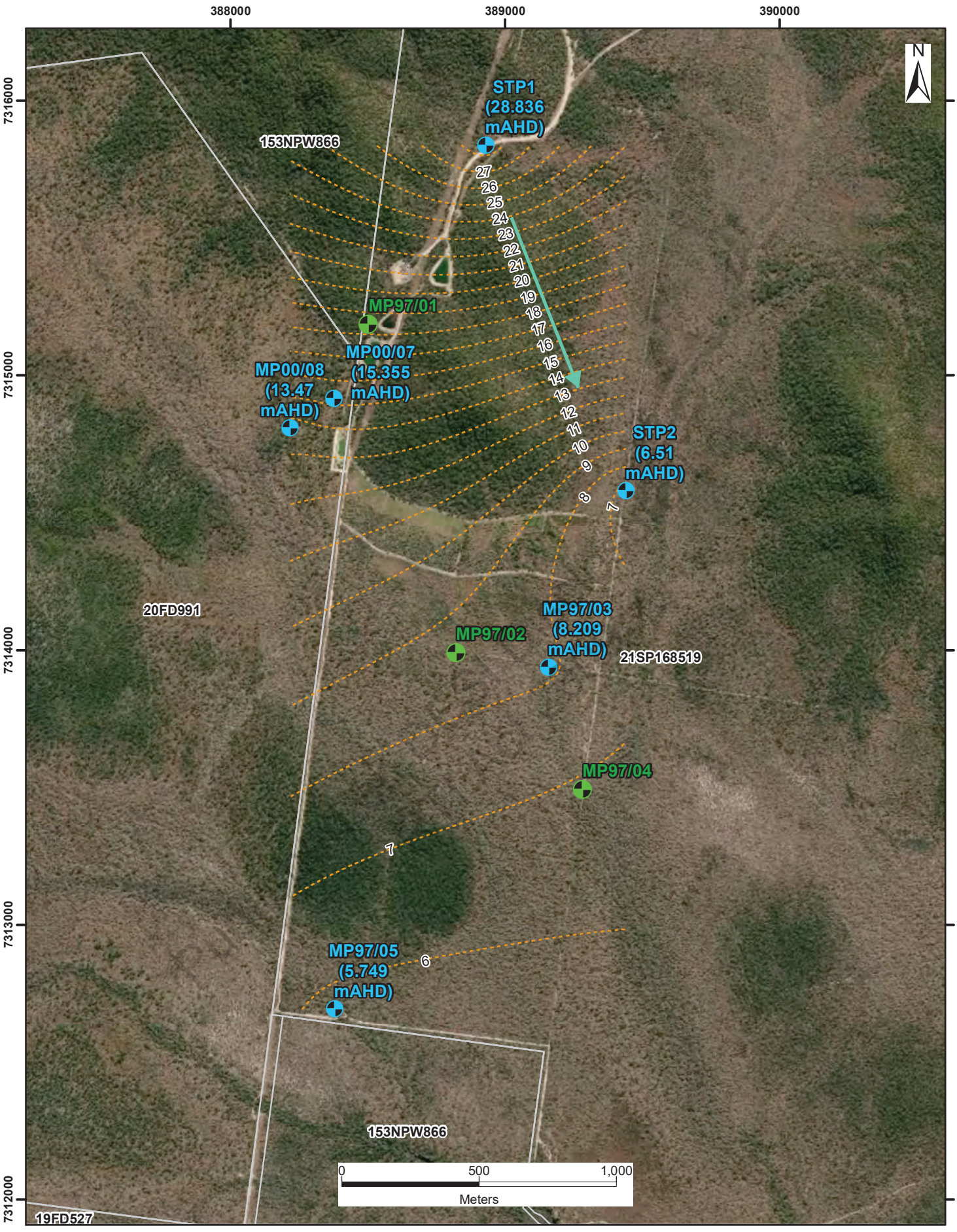
Sampled

Dry

WwTP Inferred Groundwater Flow Direction, January 2020

Figure D-15	**Trility Pty Ltd**
Date: *4/06/2020*	Author: Personal
Revision: R1	**Map Scale:** 1:18,000
	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Groundwater Bore

Sampled

Flooded

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

WwTP Inferred Groundwater Flow Direction, February 2020

Figure D-16

Trility Pty Ltd

Date: 4/06/2020

Author: Personal

Map Scale: 1:18,000

Revision: R1

Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

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JUNE 2020
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Appendix E: Graphs

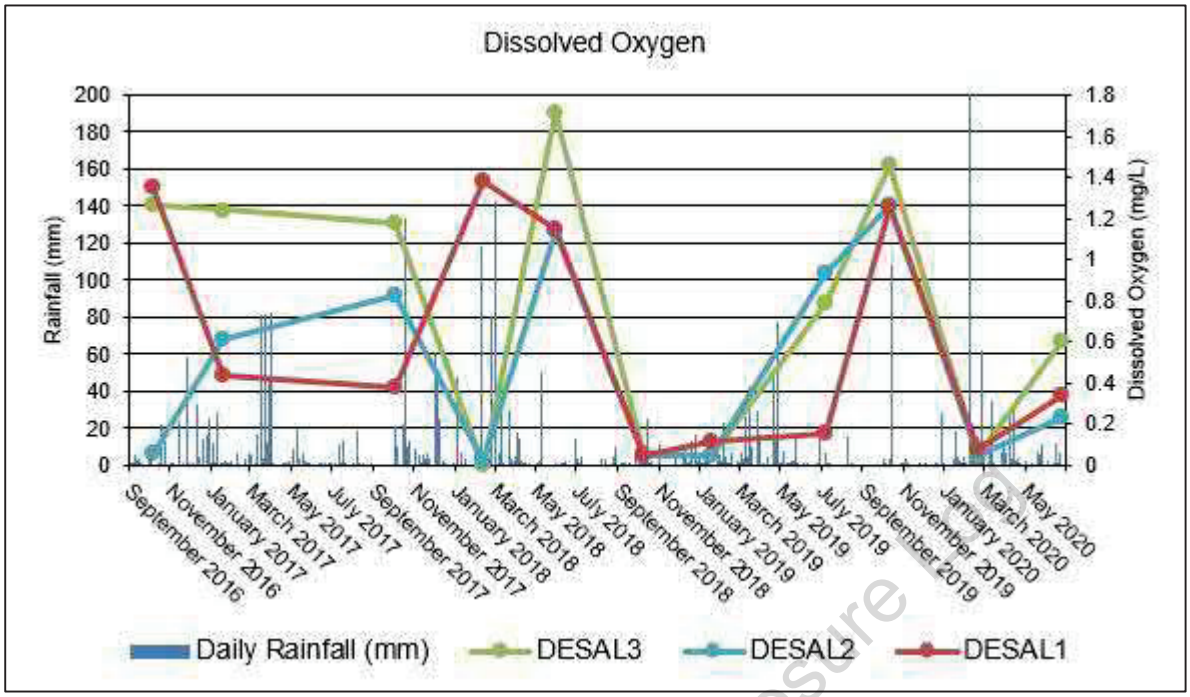

Figure 1 IWTP Dissolved Oxygen, September 2016 – June 2020

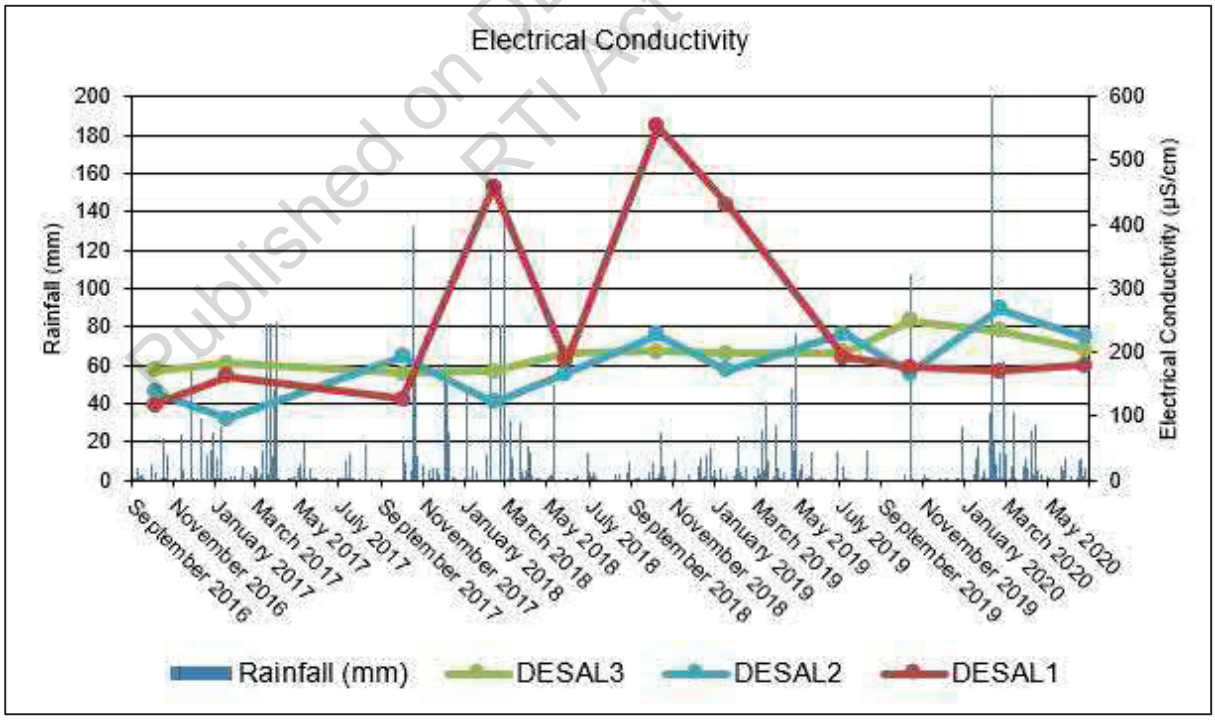

Figure 2 IWTP Electrical Conductivity, September 2016 – June 2020

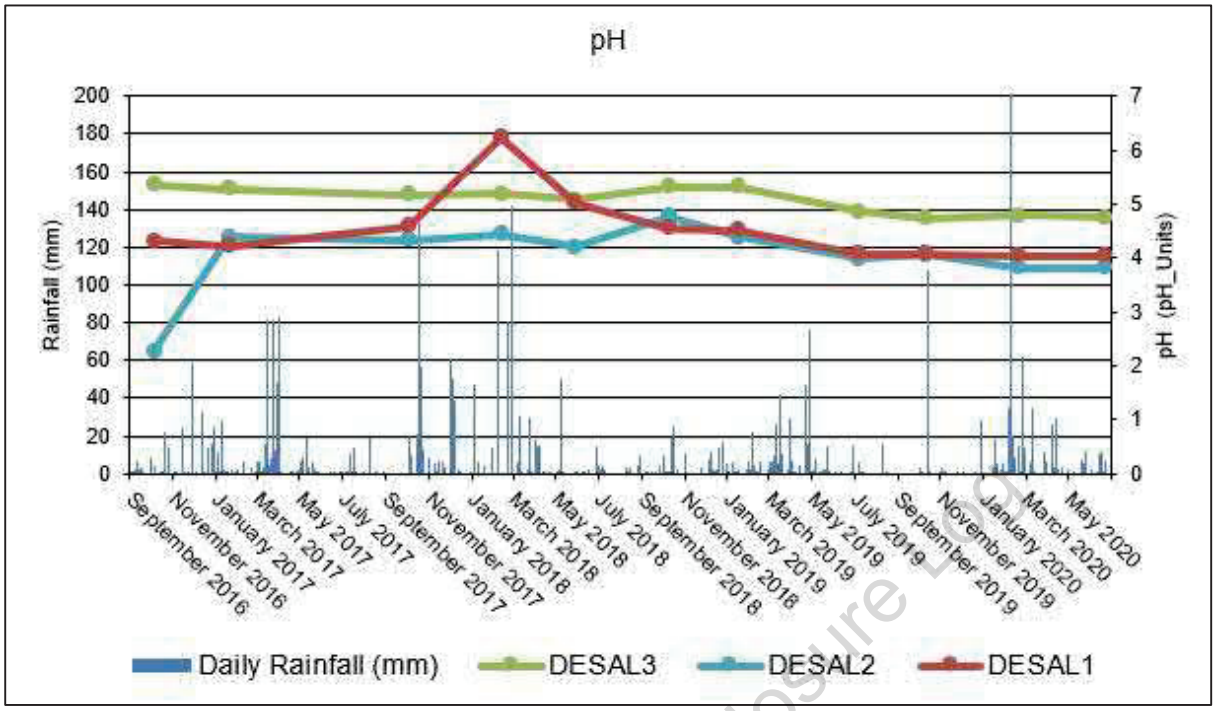

Figure 3 IWTP pH, September 2016 – June 2020

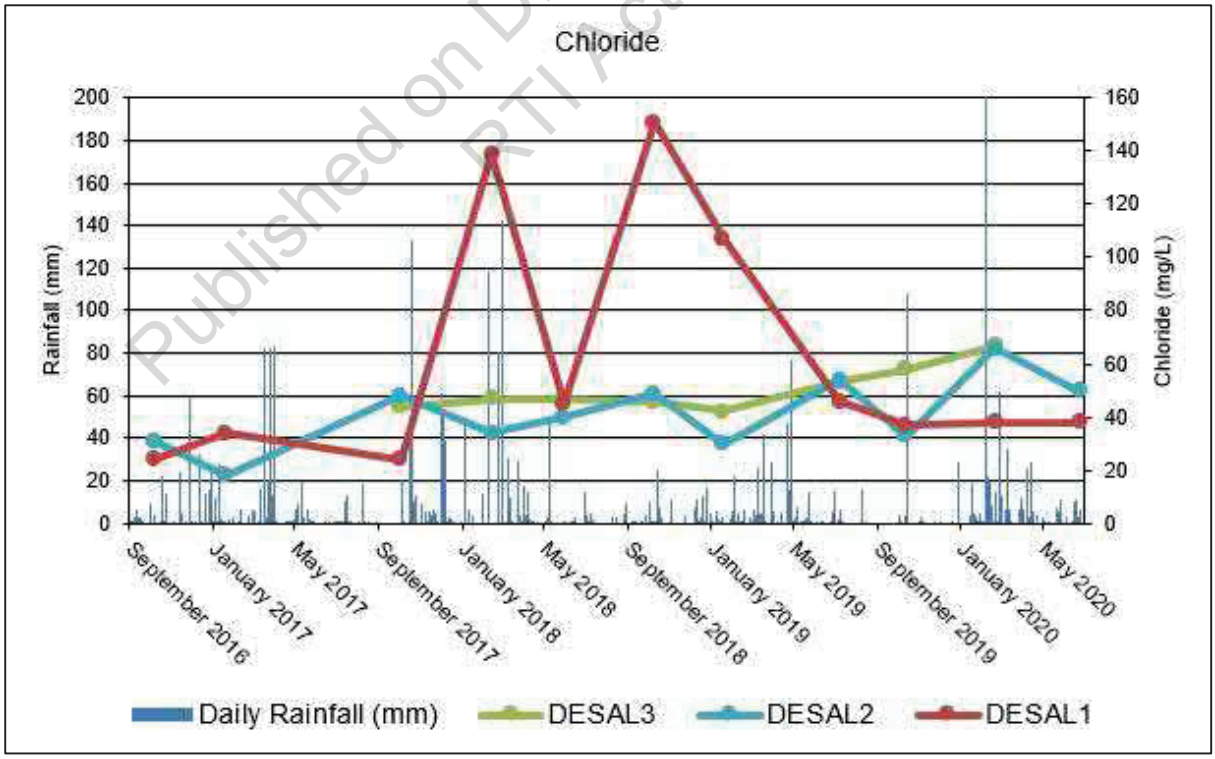

Figure 4 IWTP Chloride, September 2016 – June 2020

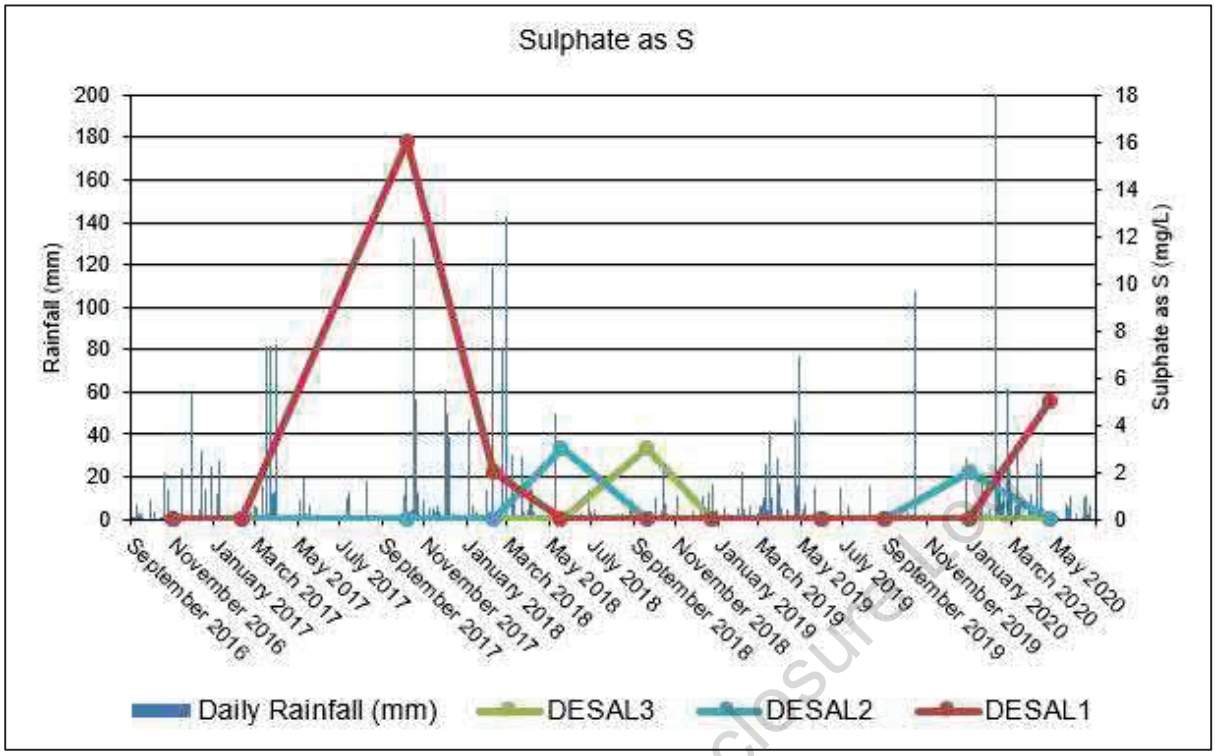

Figure 5 IWTP Sulphate, September 2016 – June 2020

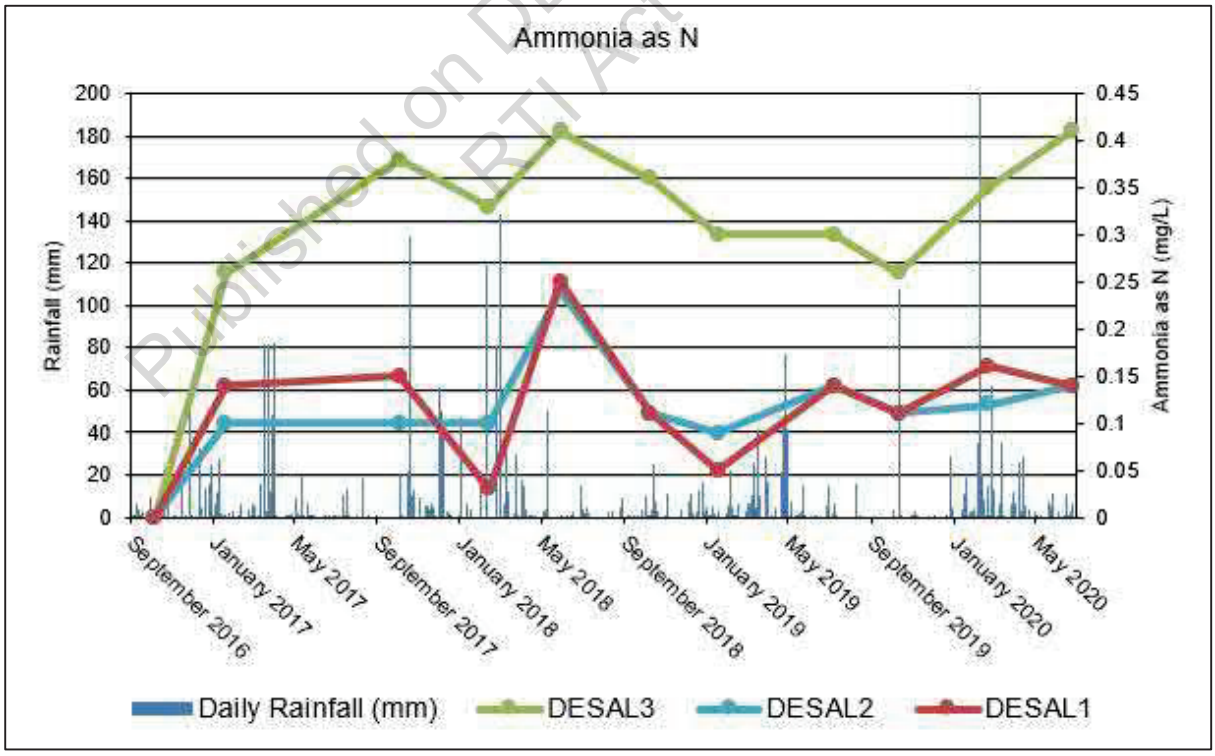

Figure 6 IWTP Ammonia, September 2016 – June 2020

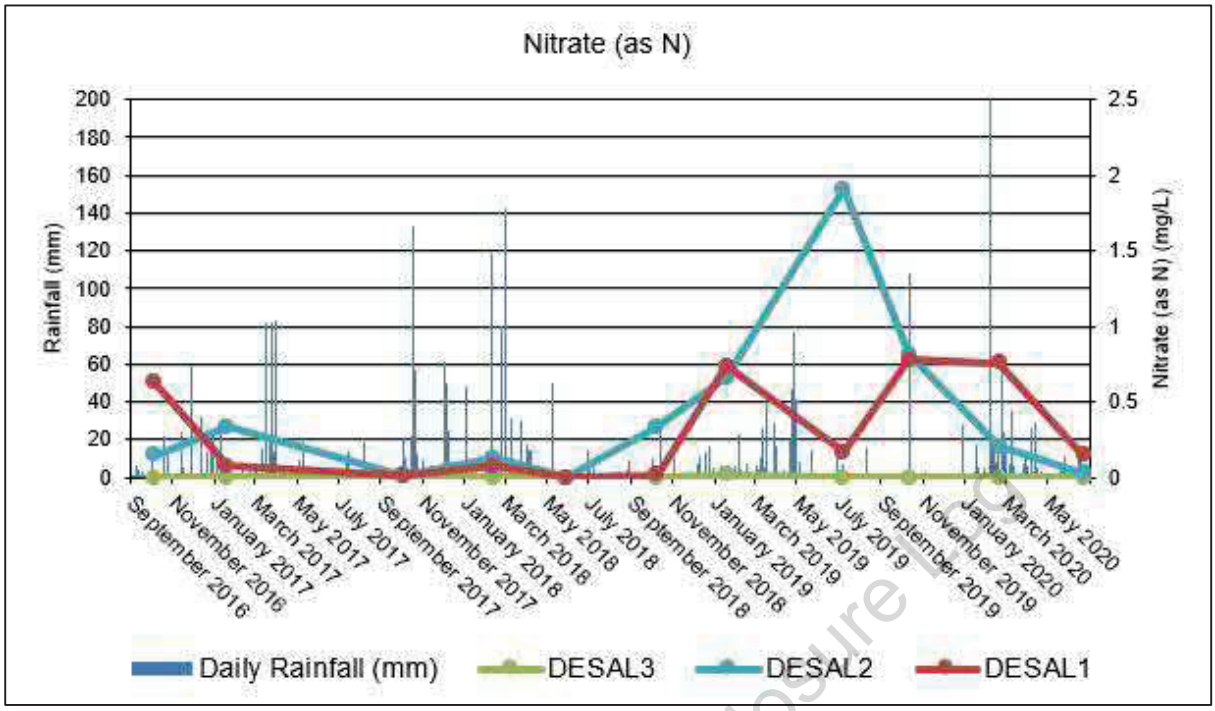

Figure 7 IWTP Nitrate, September 2016 – June 2020

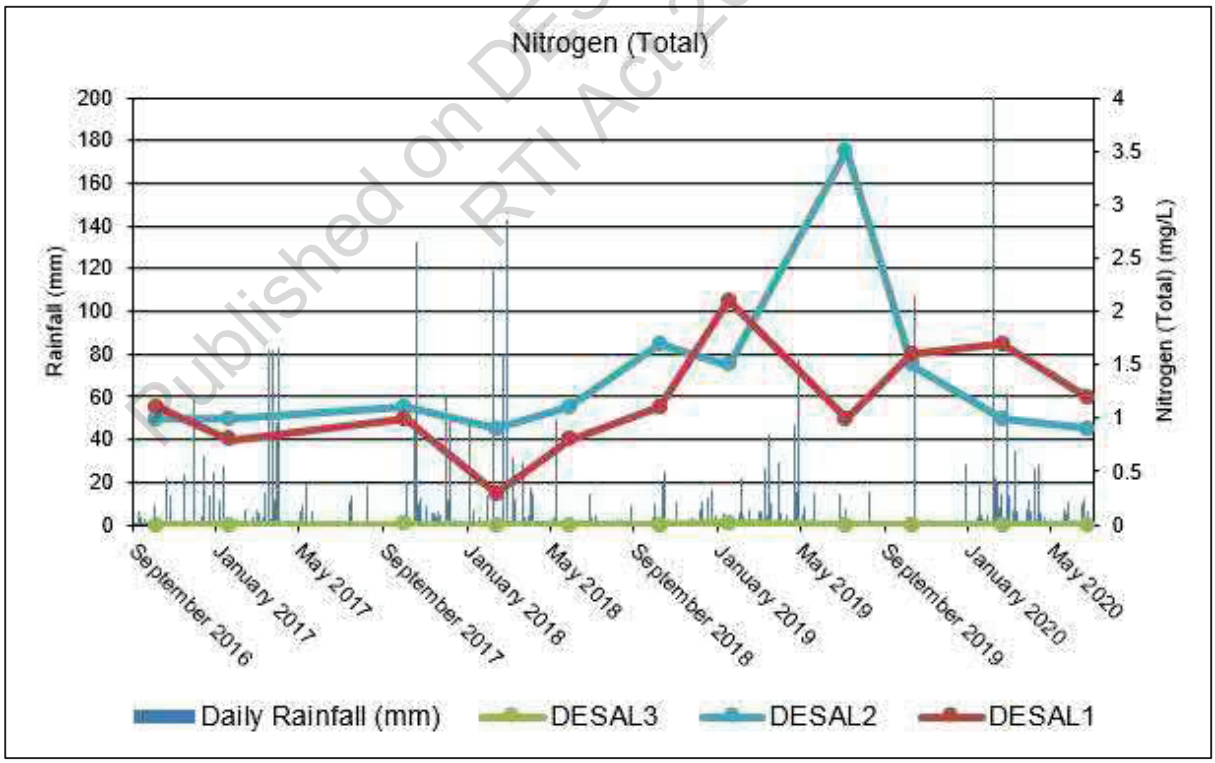

Figure 8 IWTP Total Nitrogen, September 2016 – June 2020

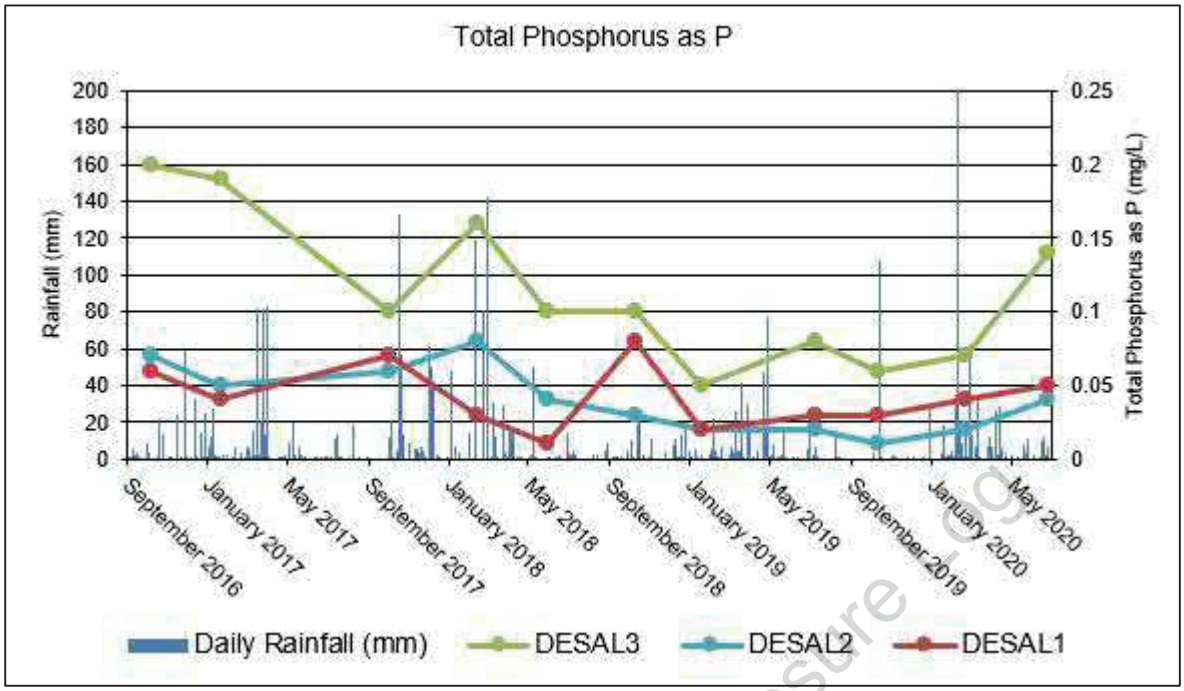

Figure 9 IWTP Total Phosphorus, September 2016 – June 2020

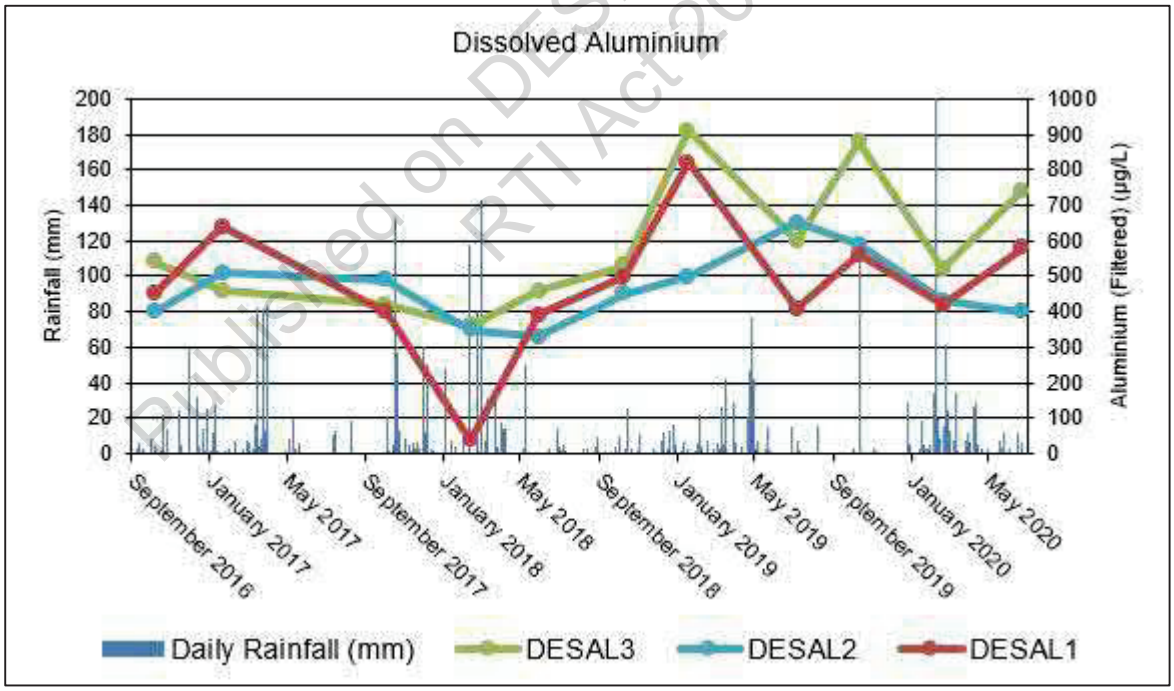

Figure 10 IWTP Dissolved Aluminium, September 2016 – June 2020

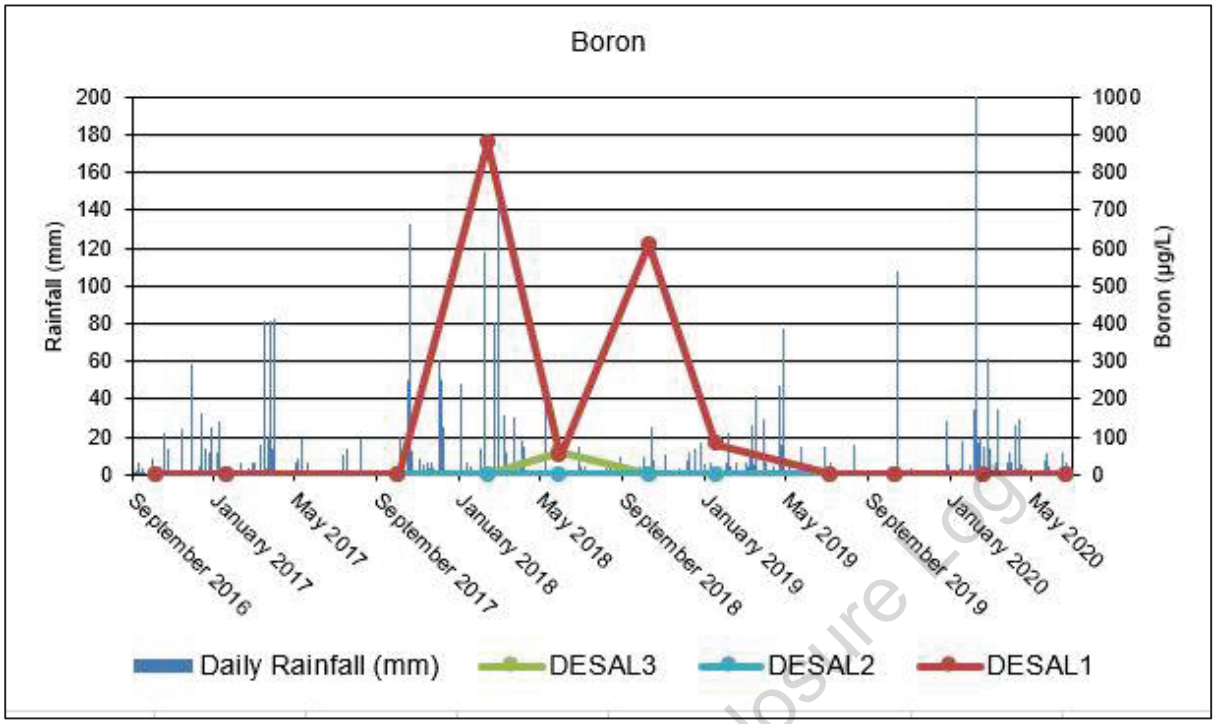

Figure 11 IWTP Total Boron, September 2016 – June 2020

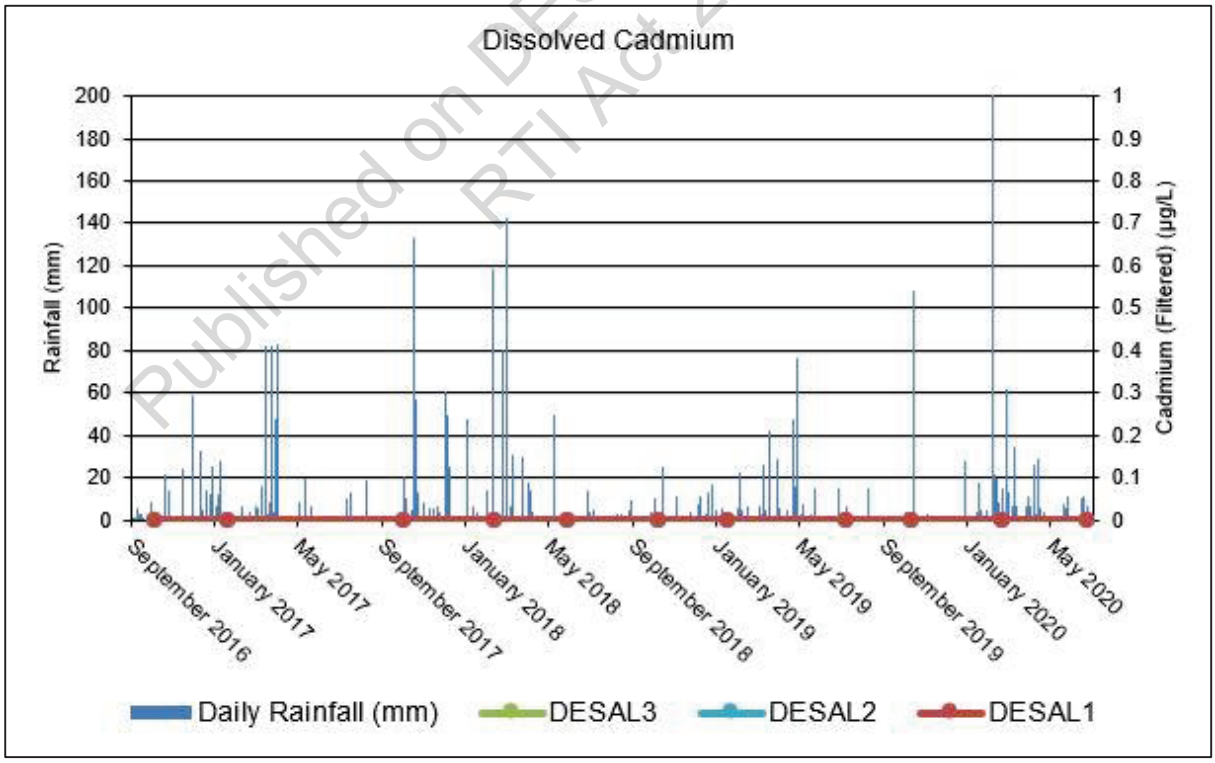

Figure 12 IWTP Dissolved Cadmium, September 2016 – June 2020

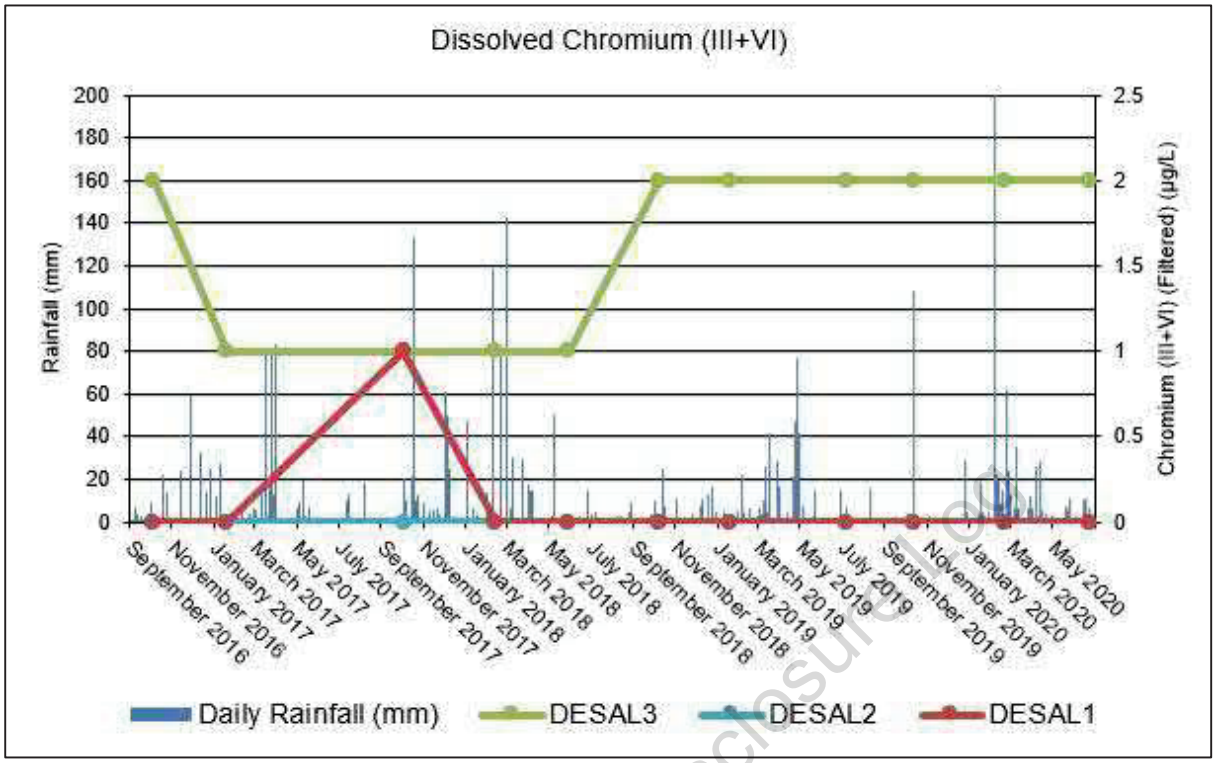

Figure 13 IWTP Dissolved Chromium, September 2016 – June 2019

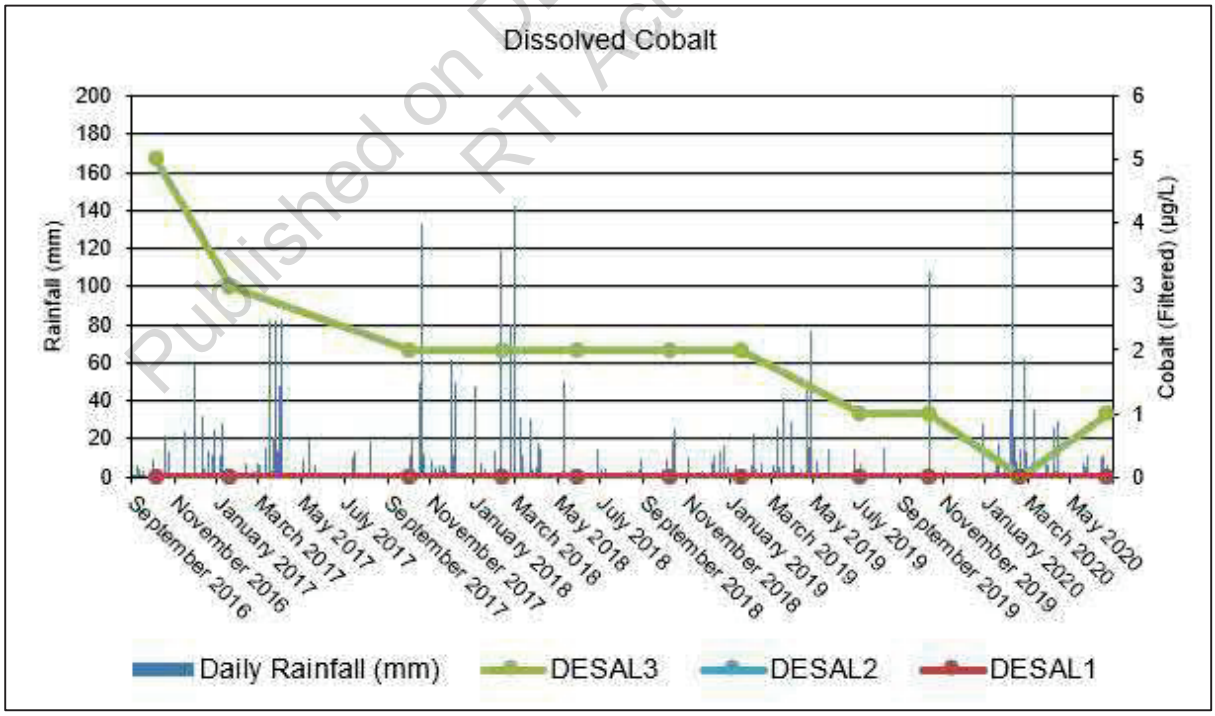

Figure 14 IWTP Dissolved Cobalt, September 2016 – June 2020

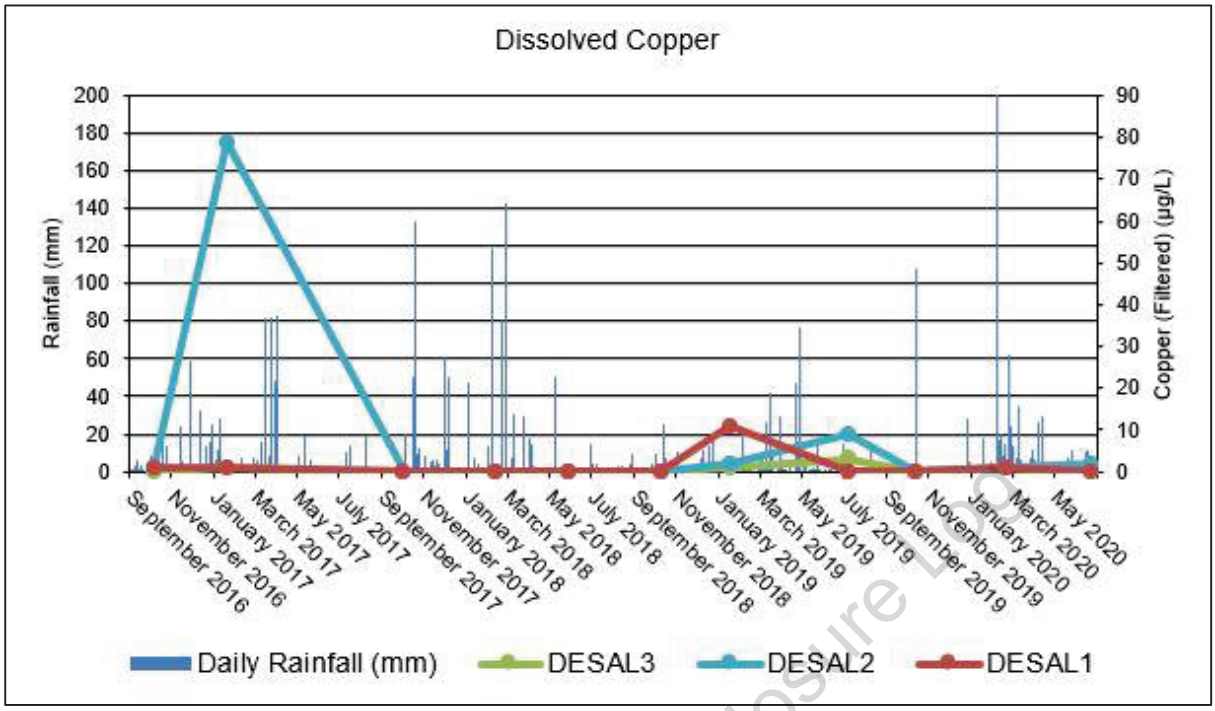

Figure 15 IWTP Dissolved Copper, September 2016 – June 2020

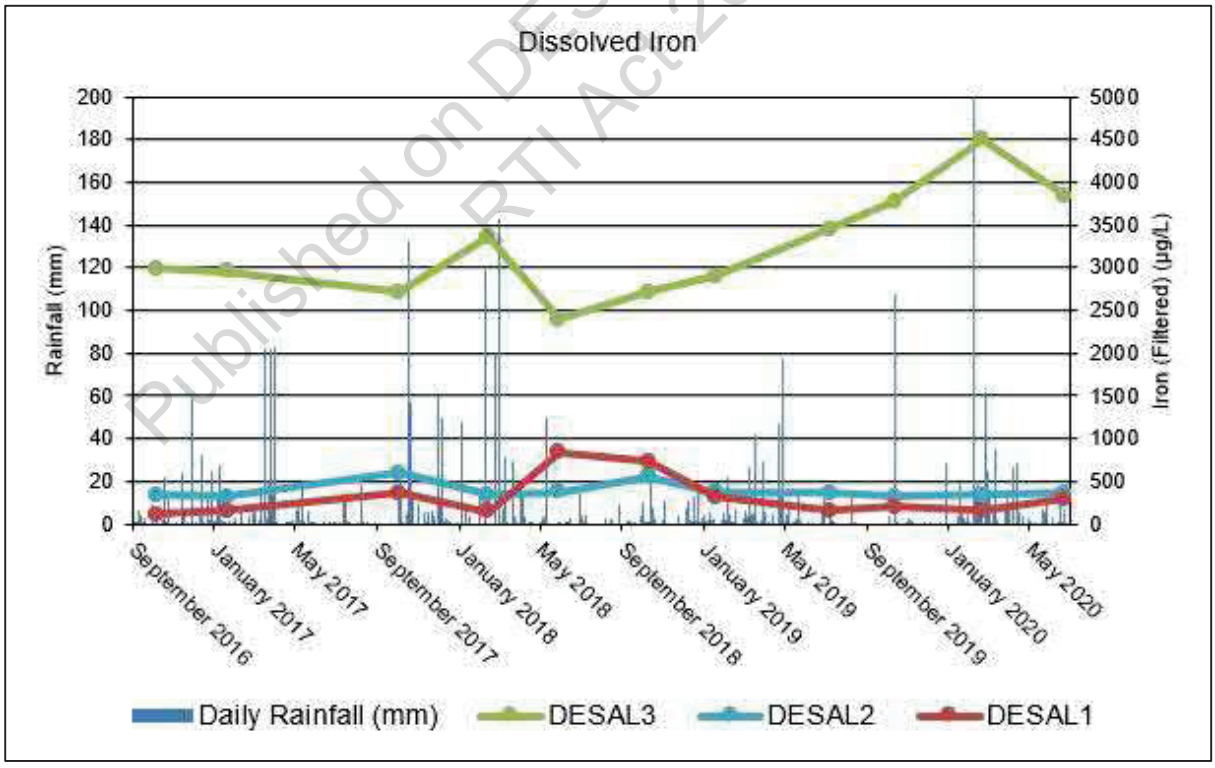

Figure 16 IWTP Dissolved Iron, September 2016 – June 2020

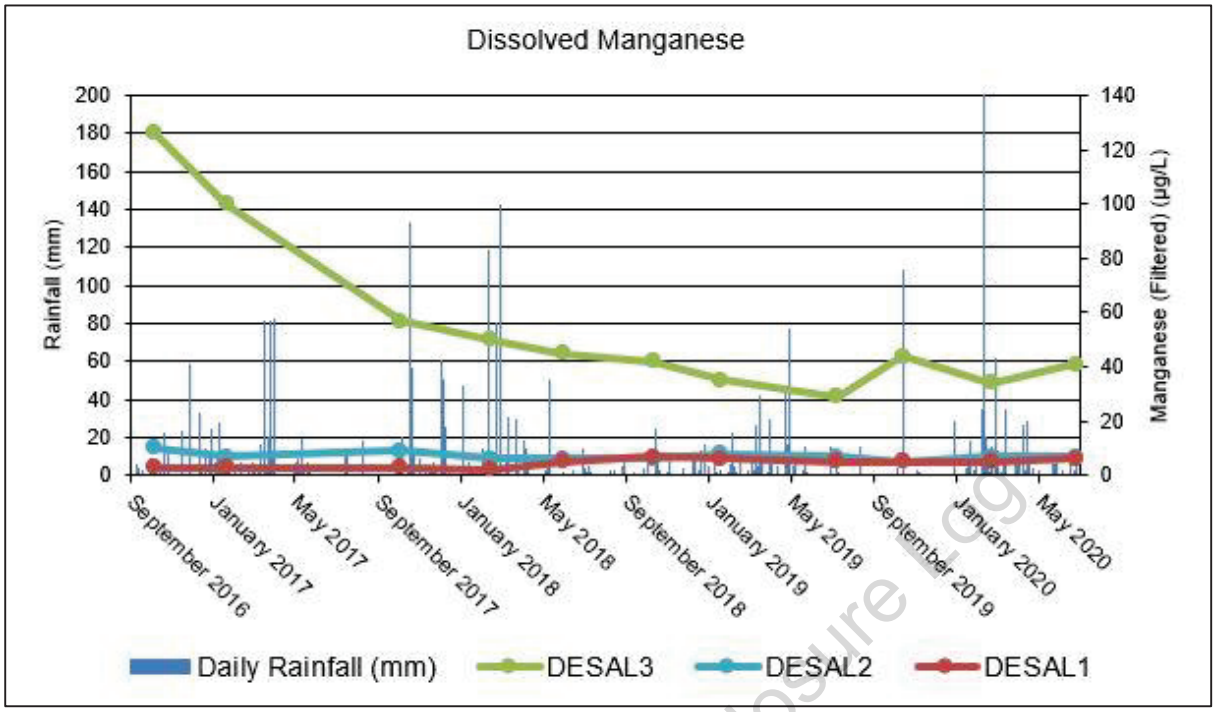

Figure 17 IWTP Dissolved Manganese, September 2016 – June 2020

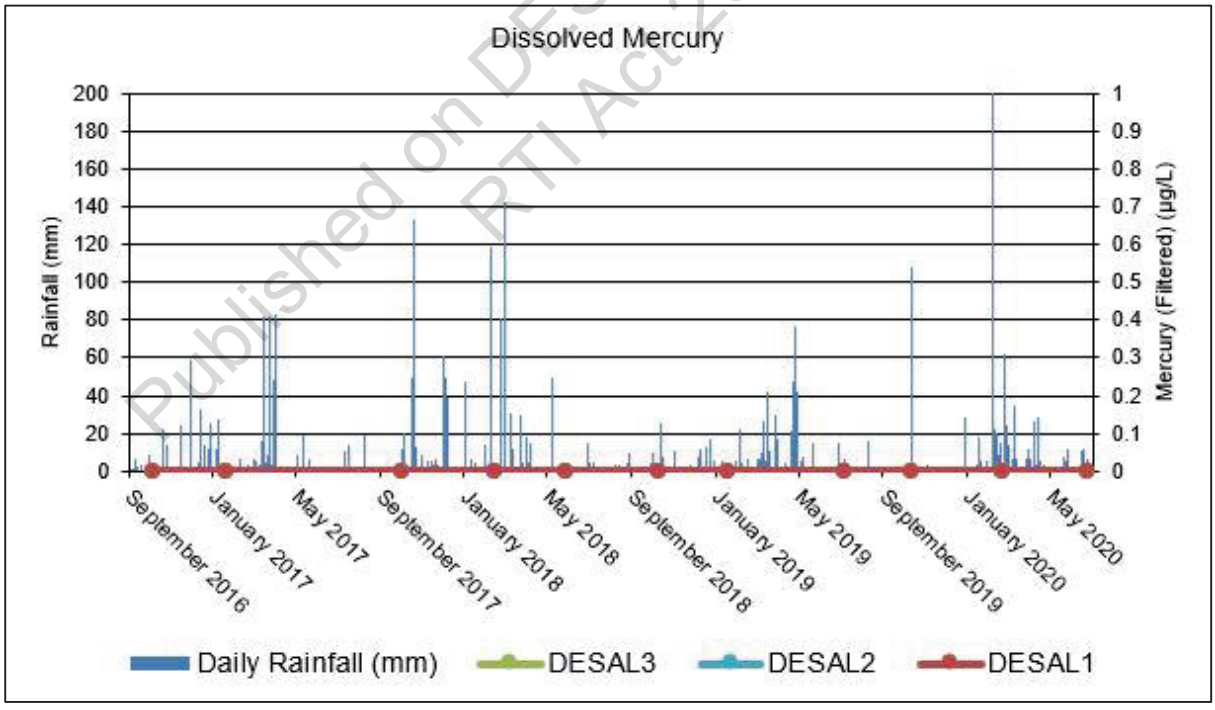

Figure 18 IWTP Dissolved Mercury, September 2016 – June 2020

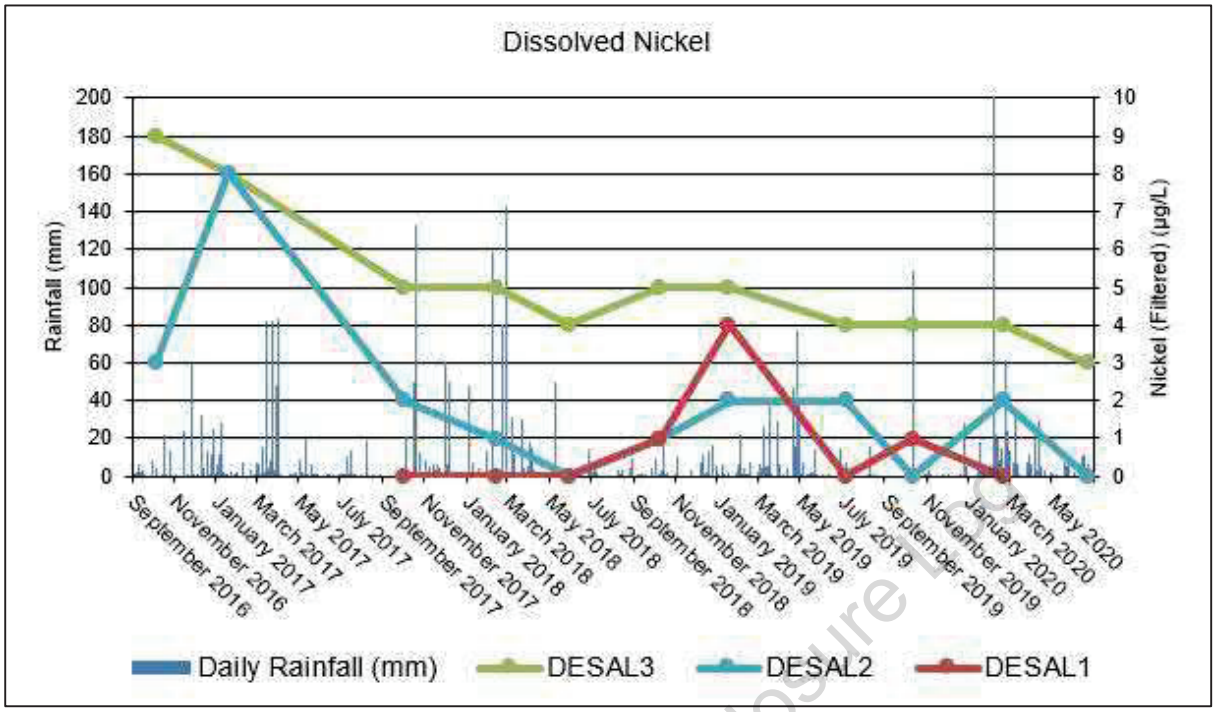

Figure 19 IWTP Dissolved Nickel, September 2016 – June 2020

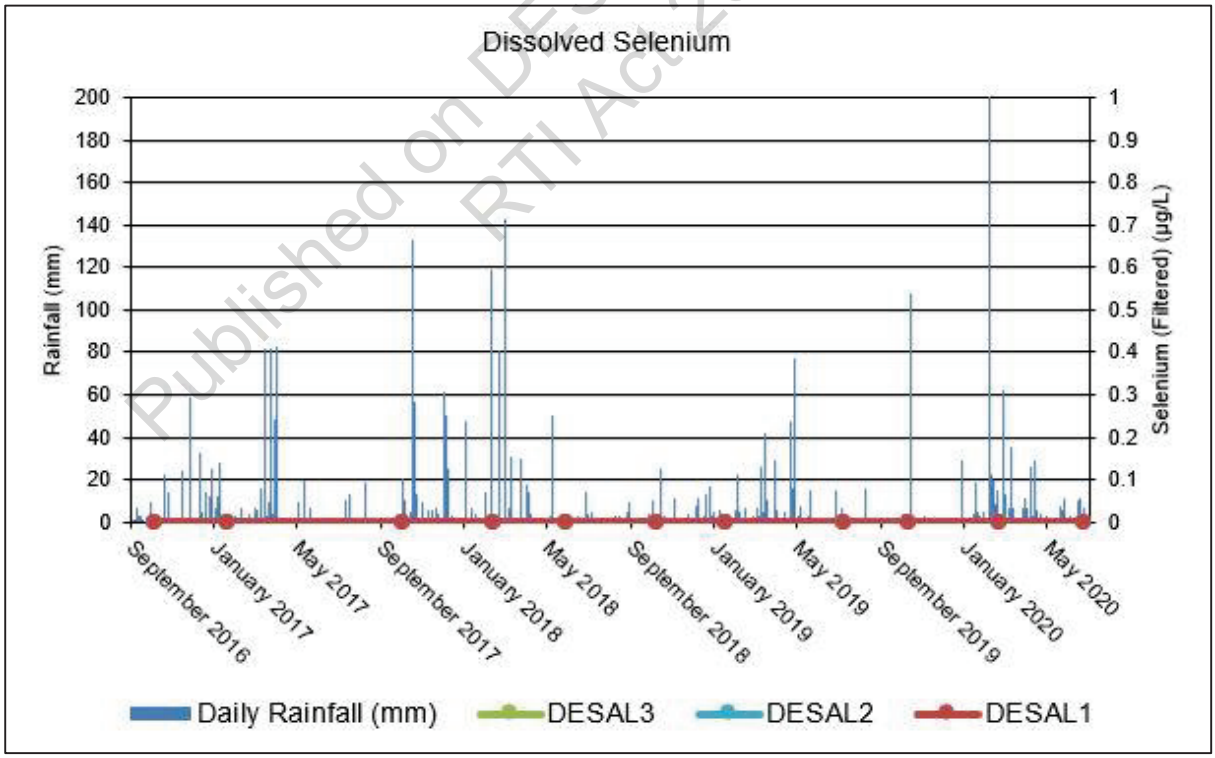

Figure 20 IWTP Dissolved Selenium, September 2016 – June 2020

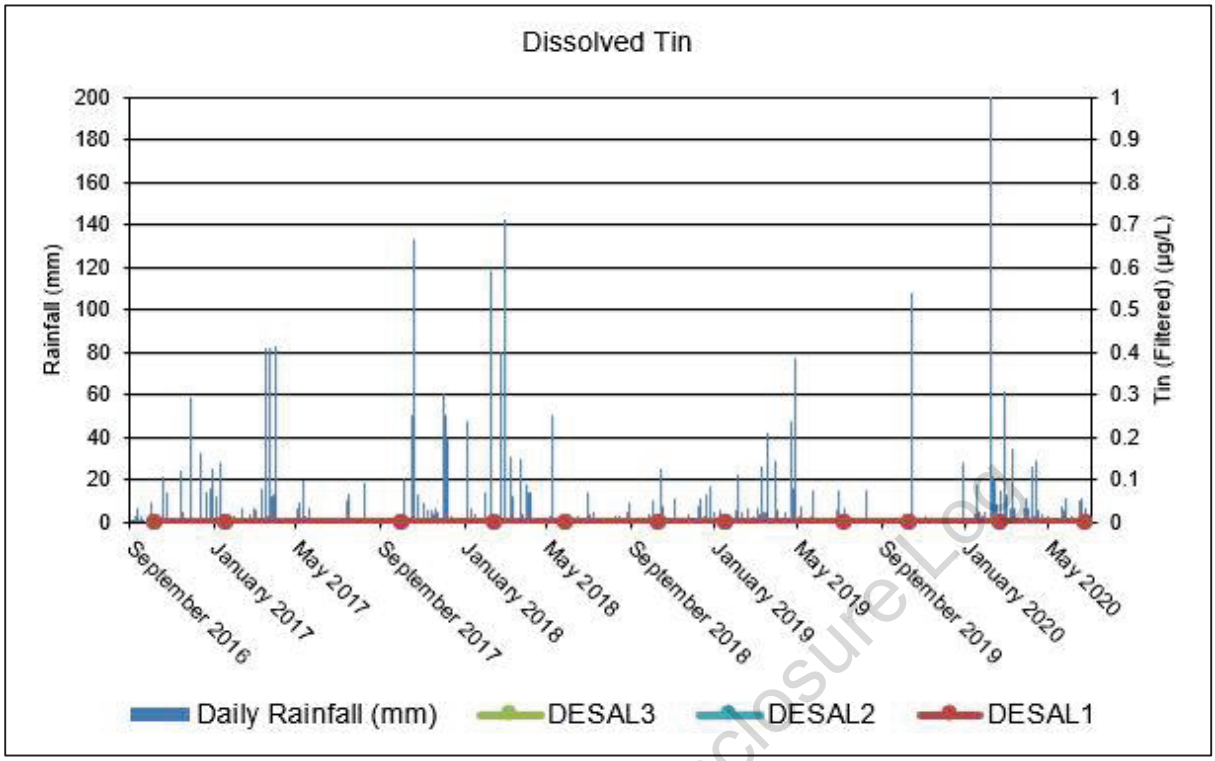

Figure 21 IWTP Dissolved Tin, September 2016 – June 2020

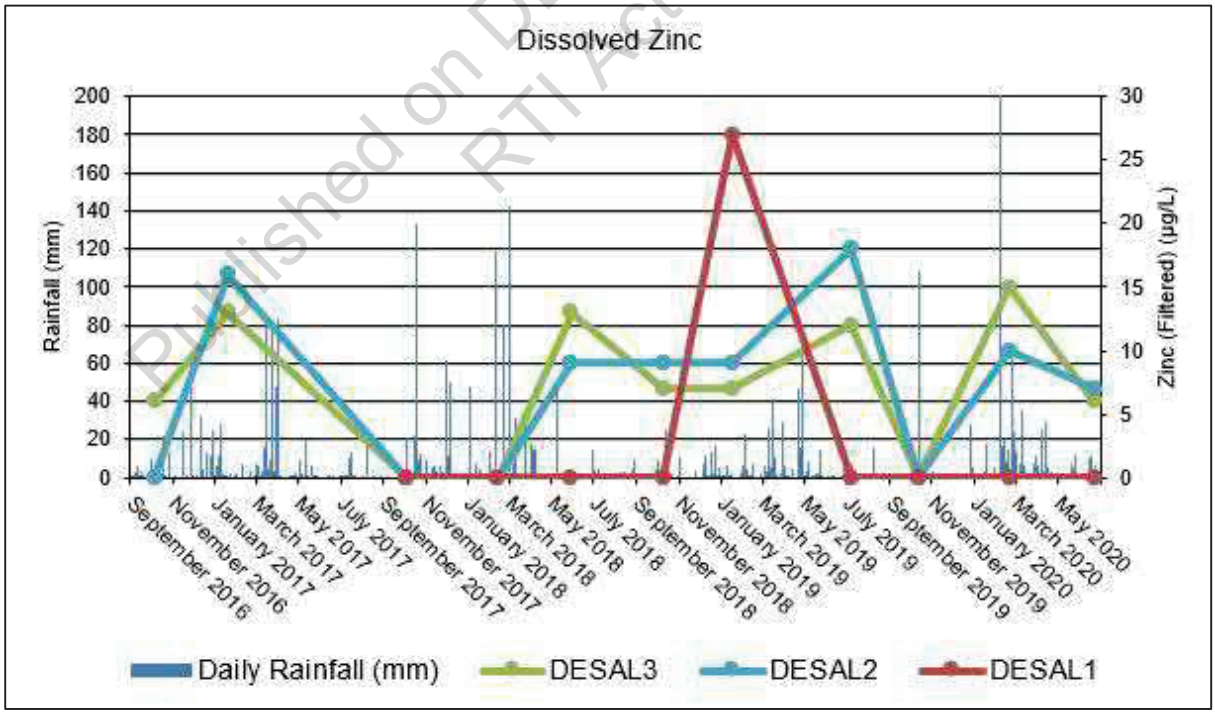

Figure 22 IWTP Dissolved Zinc, September 2016 – June 2020

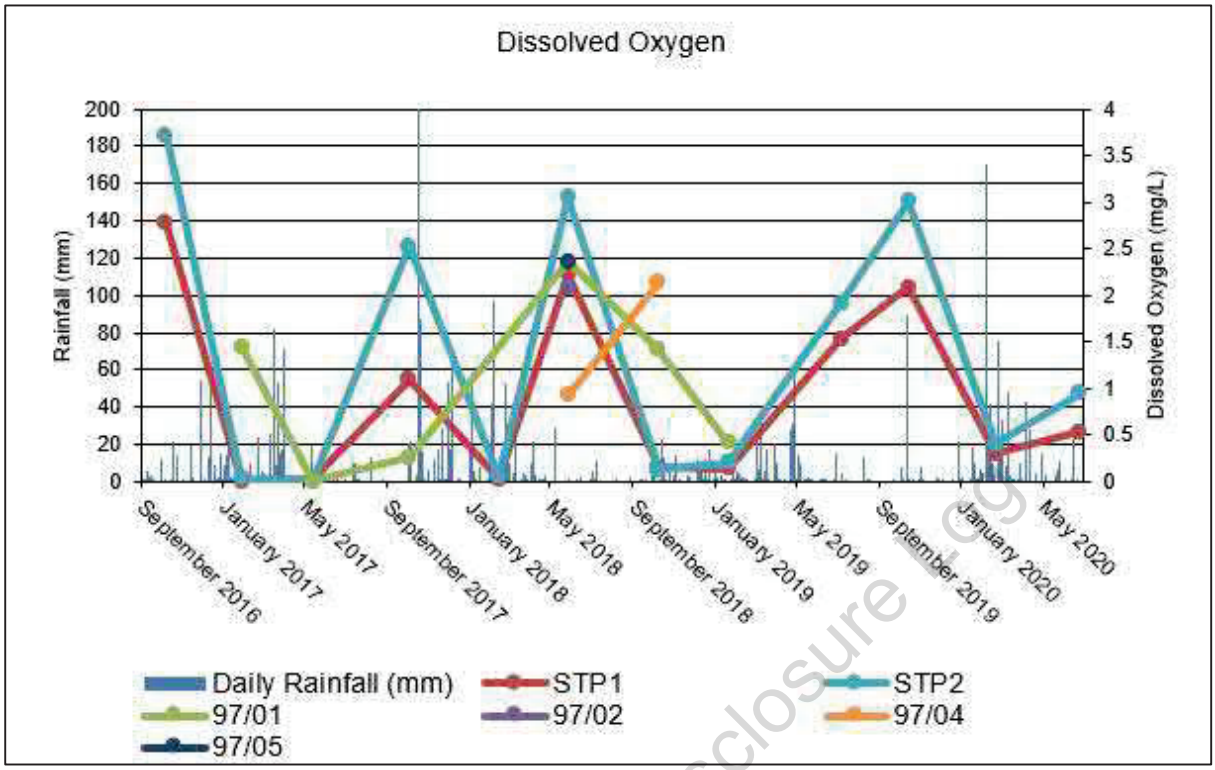

Figure 23 WwTP Dissolved Oxygen, September 2016 – June 2020

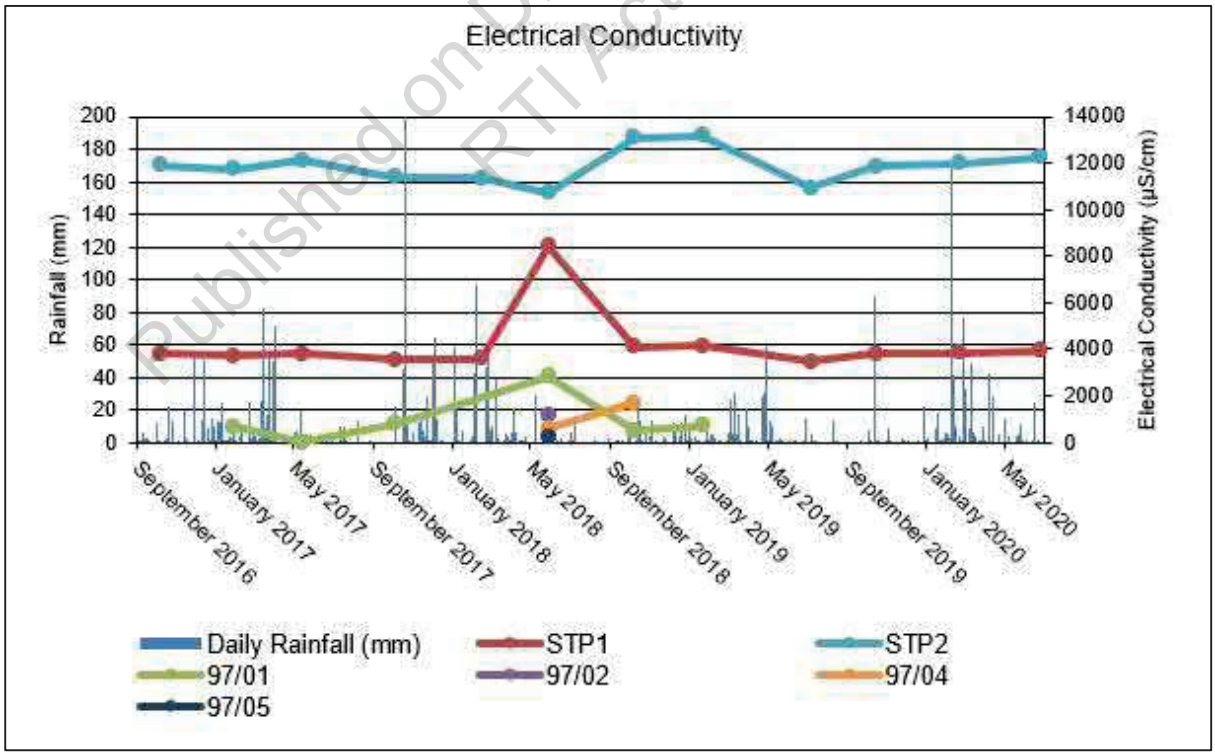

Figure 24 WwTP Electrical Conductivity, September 2016 – June 2020

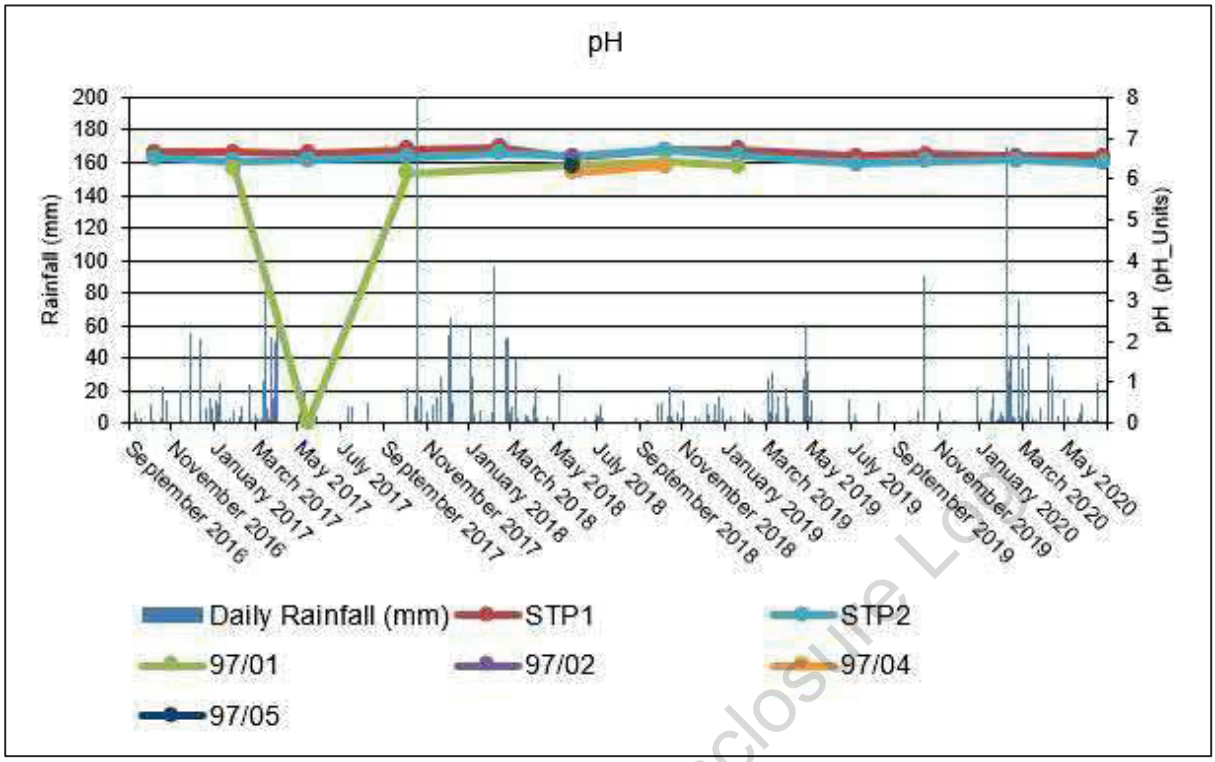

Figure 25 WwTP pH, September 2016 – June 2020

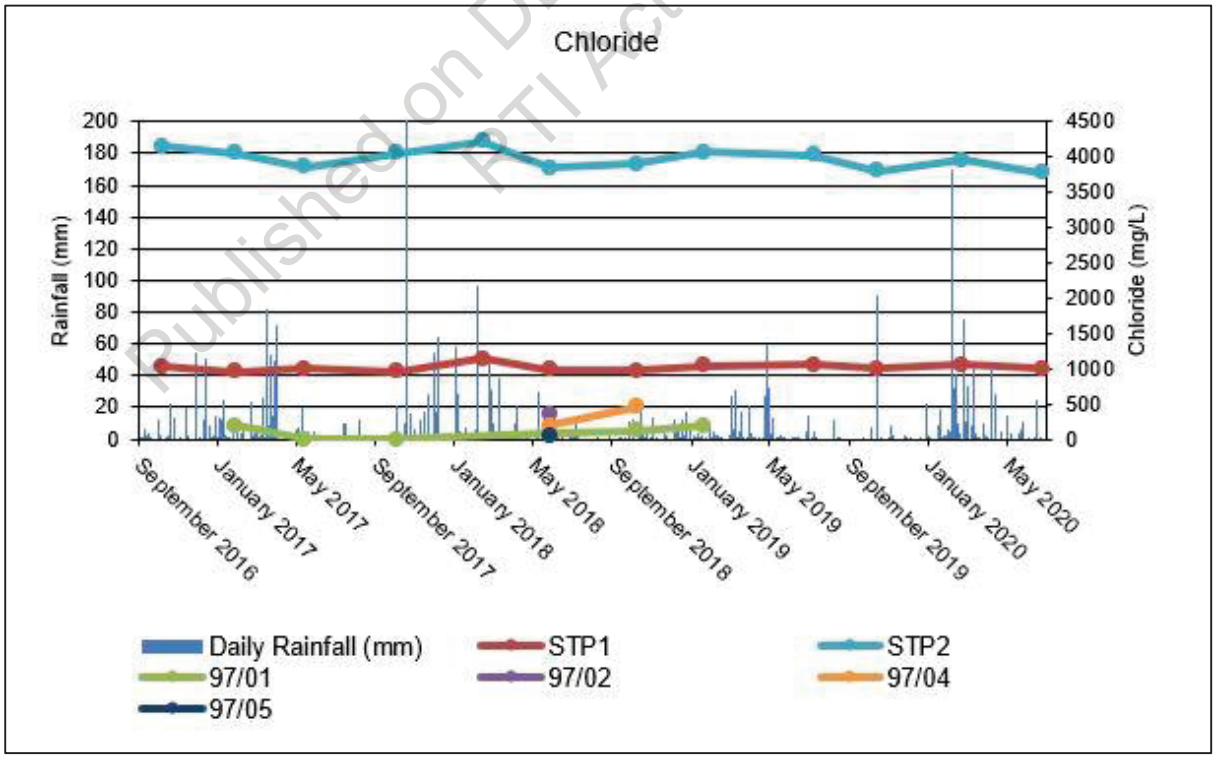

Figure 26 WwTP Chloride, September 2016 – June 2020

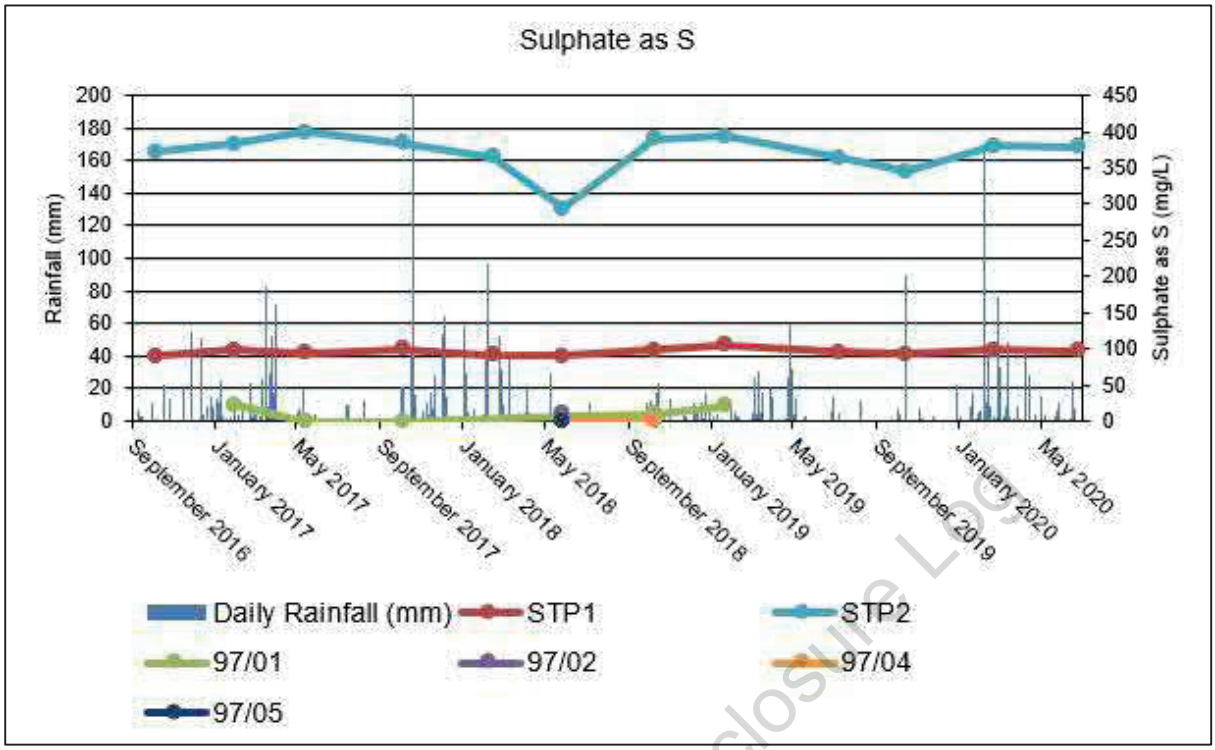

Figure 27 WwTP Sulphate, September 2016 – June 2020

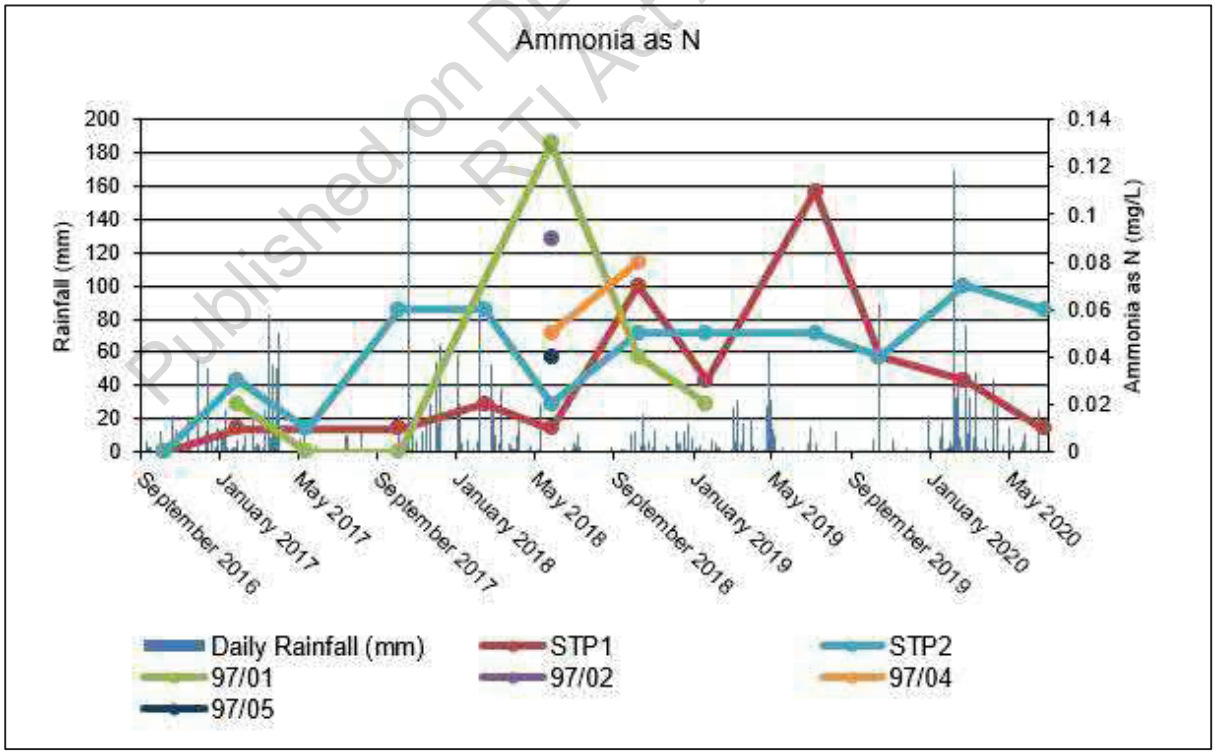

Figure 28 WwTP Ammonia, September 2016 – June 2020

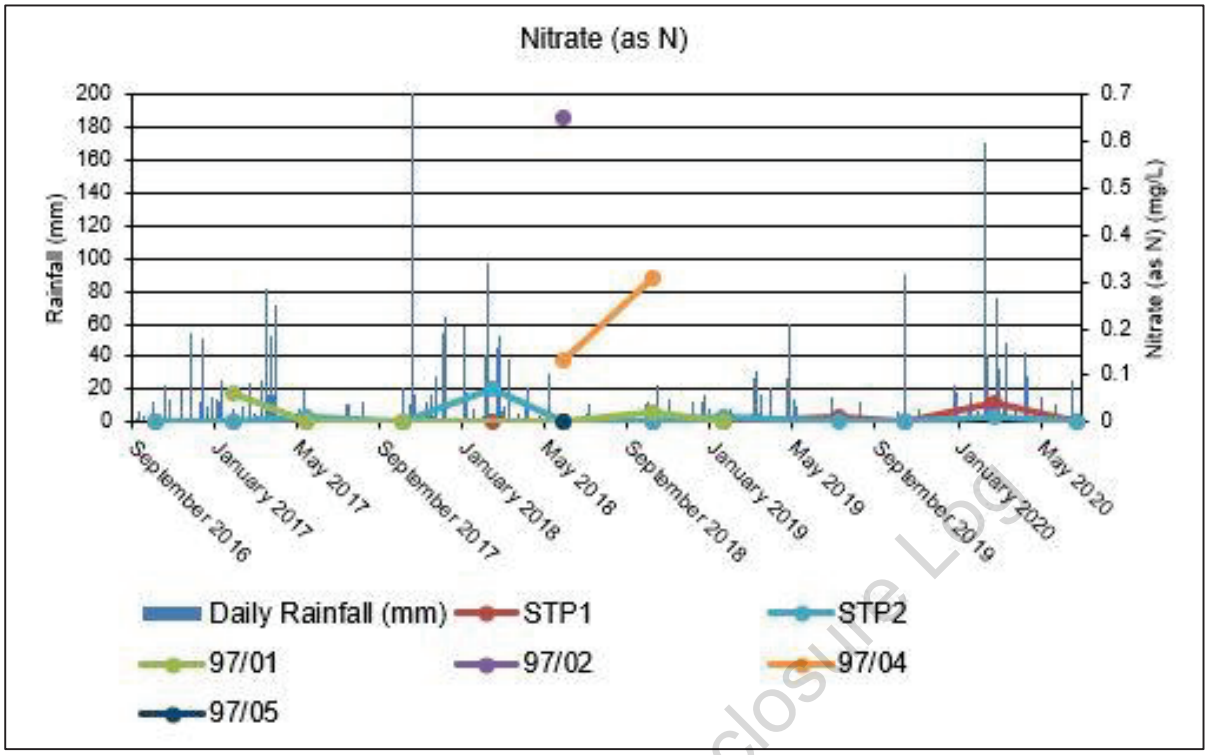

Figure 29 WwTP Nitrate, September 2016 – June 2020

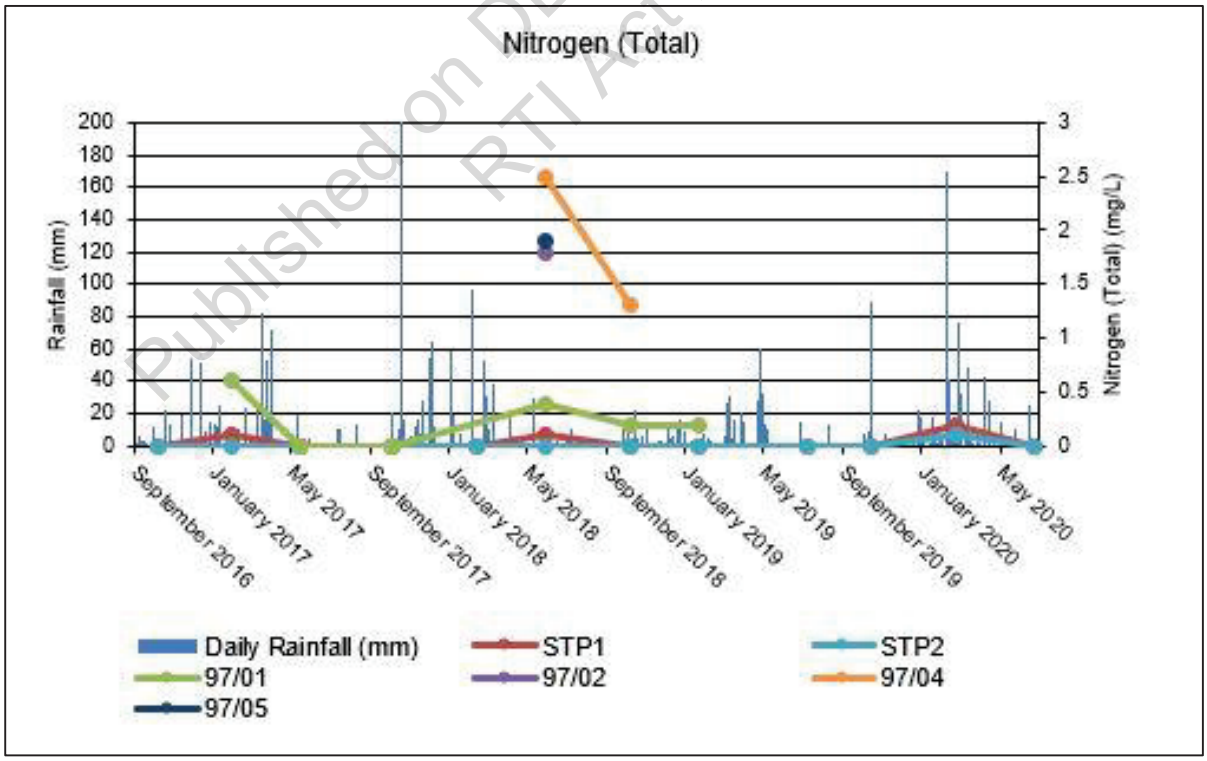

Figure 30 WwTP Total Nitrogen, September 2016 – June 2020

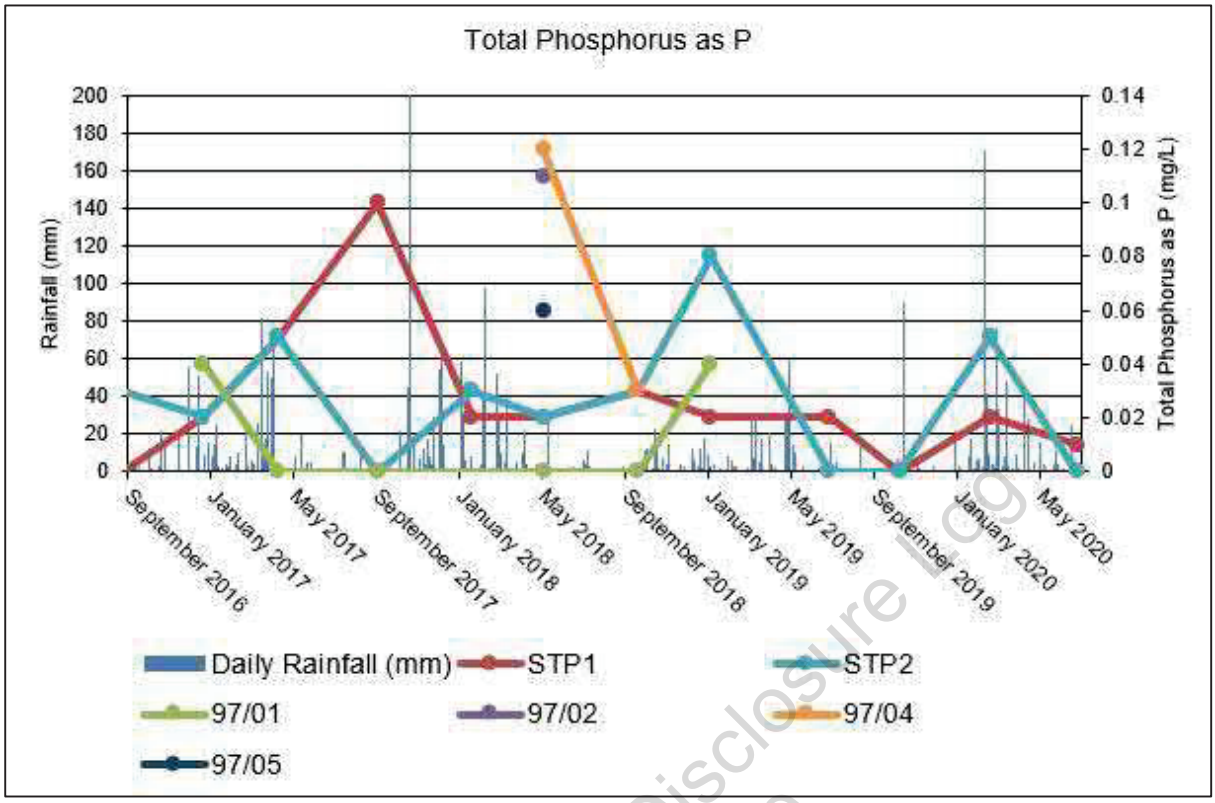

Figure 31 WwTP Total Phosphorus, September 2016 – June 2020

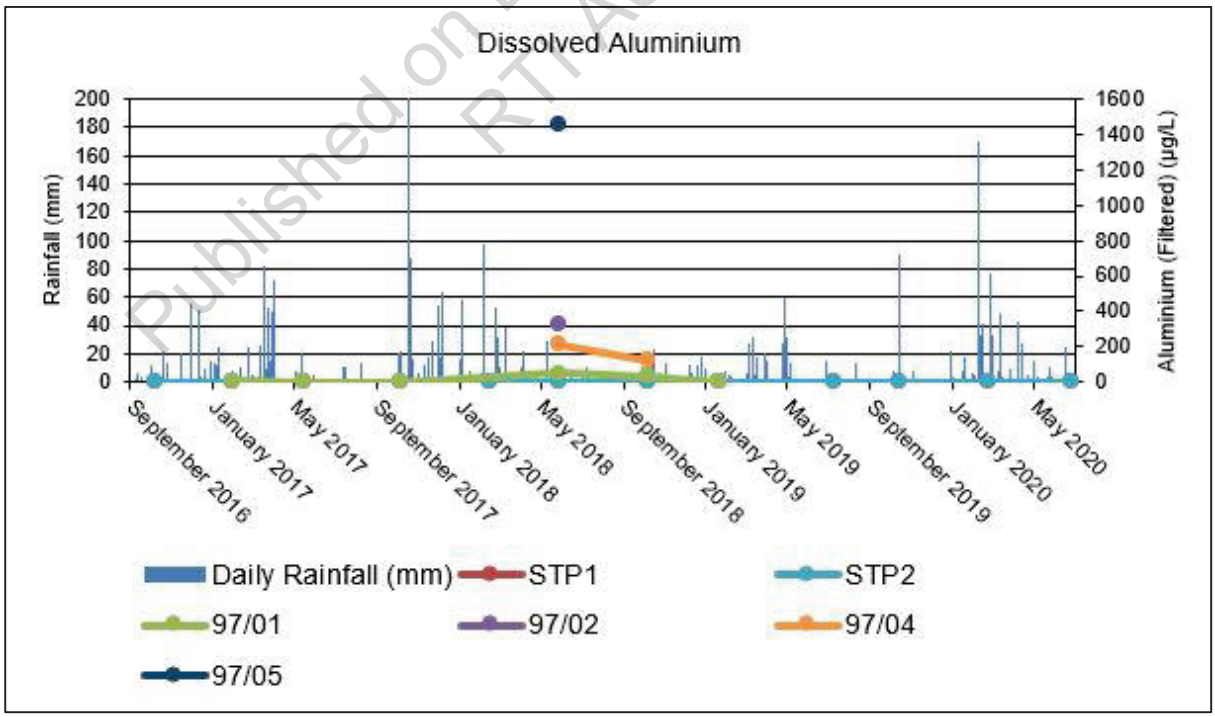

Figure 32 WwTP Dissolved Aluminium, September 2016 – June 2020

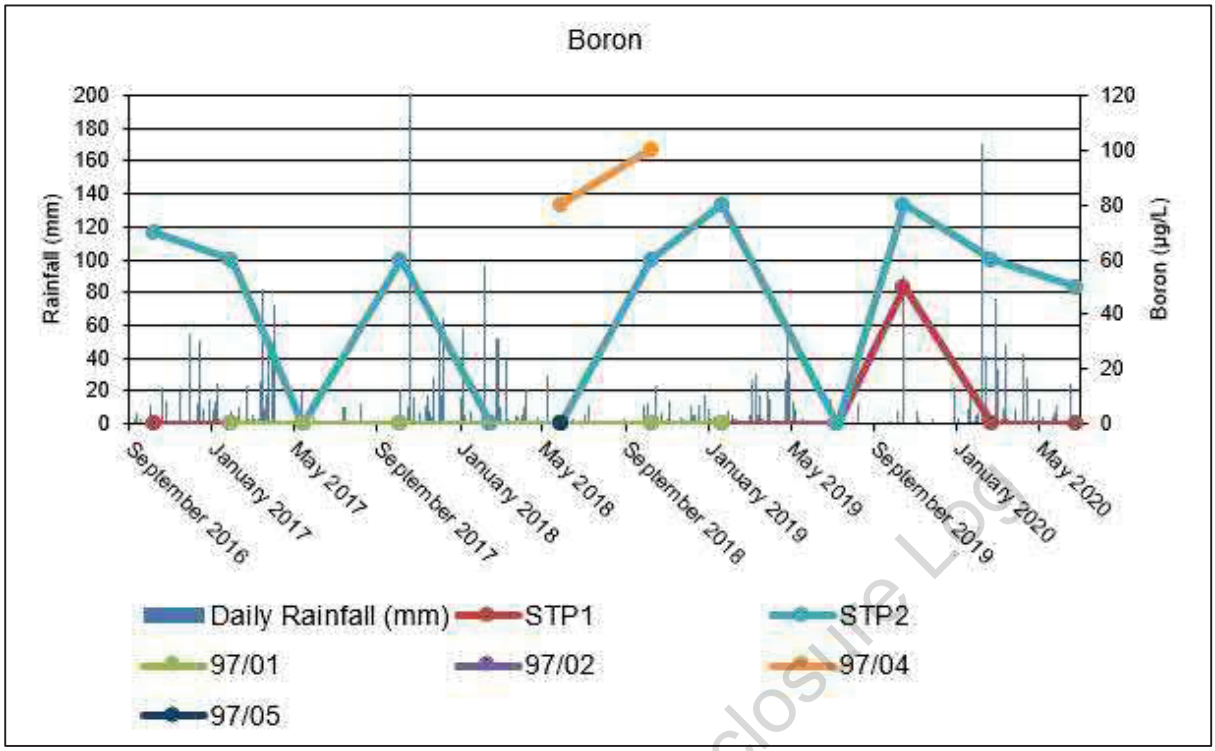

Figure 33 WwTP Total Boron, September 2016 – June 2020

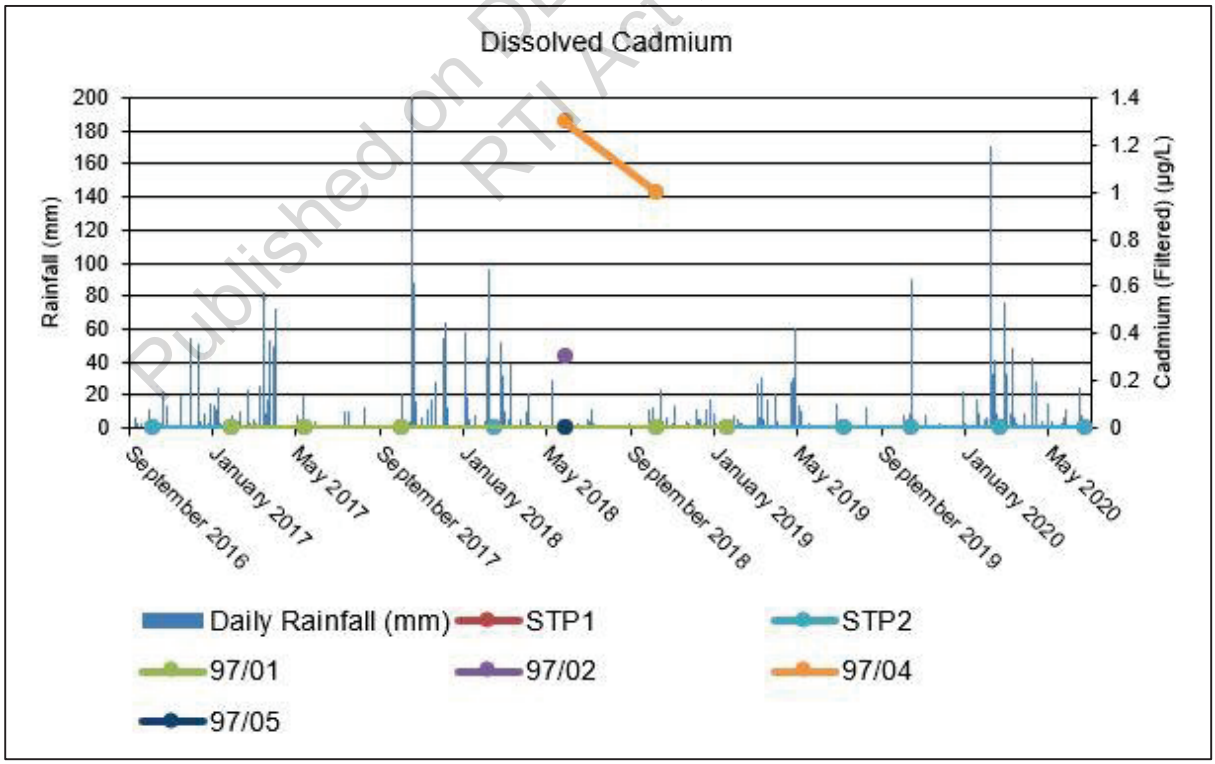

Figure 34 WwTP Dissolved Cadmium, September 2016 – June 2020

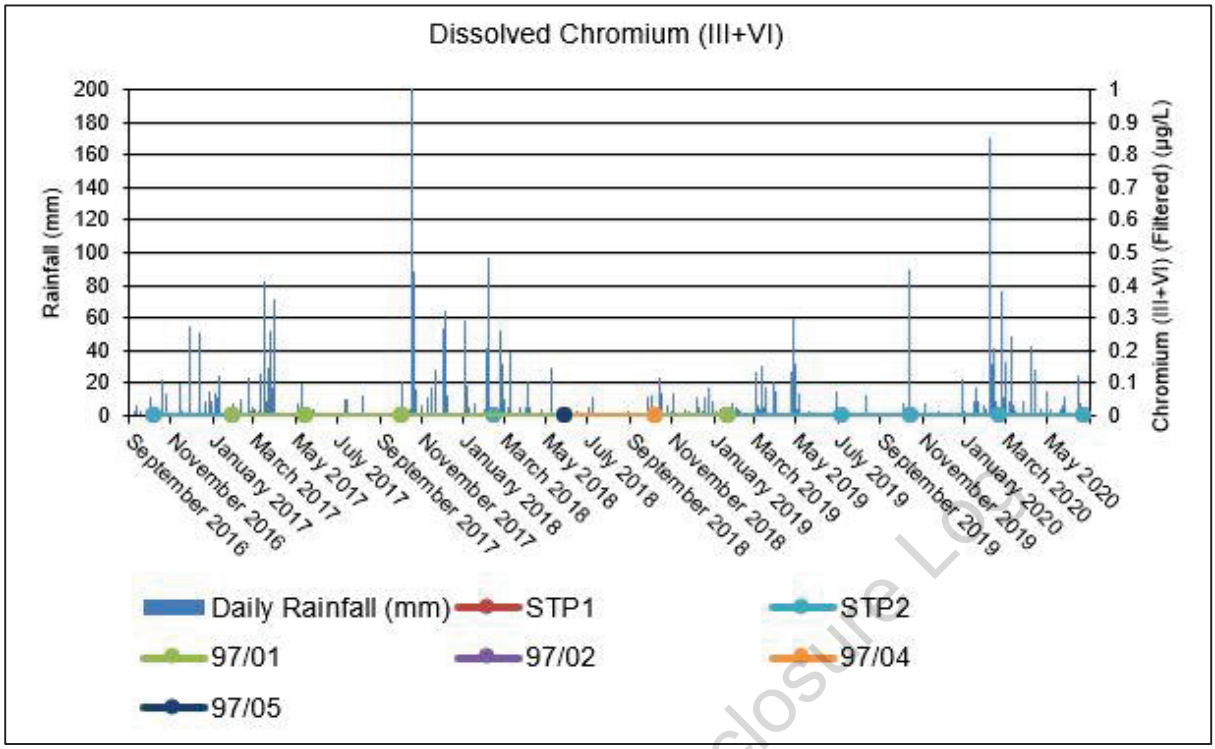

Figure 35 WwTP Dissolved Chromium, September 2016 – June 2020

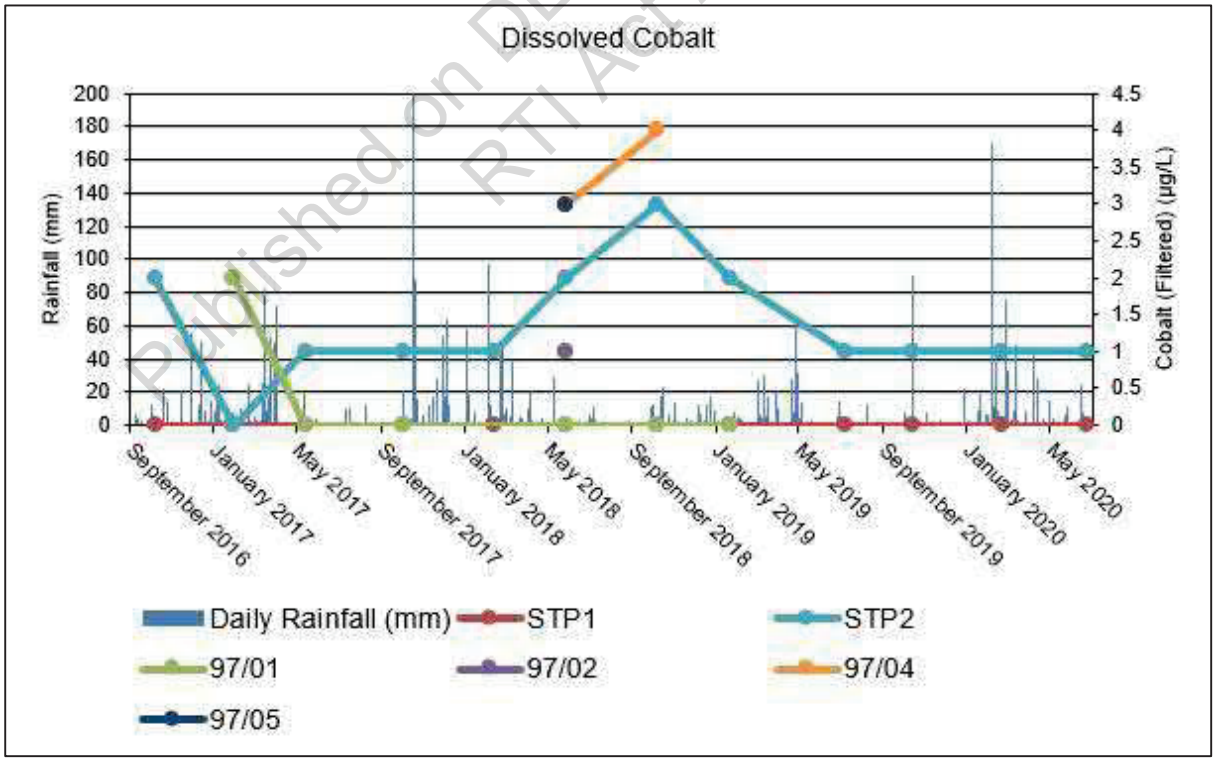

Figure 36 WwTP Dissolved Cobalt, September 2016 – June 2020

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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

Document Control

Document Quality Management Details.		
Report Name:	June 2020 Annual Report	
Site Details:	Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water	
Project Number:	J169864	
Client Name:	Trility Pty Ltd	
Client Number:	C114943	
Signatures:	Prepared By: sch4p4(6) Personal Information p4(6) Personal Inform Environmental Consultant	Authorised By: sch4p4(6) Personal Information h4p4(6) Personal Informati Principal Consultant - Environment

Issue Status

Version No.	Date	Creator	Reviewer
1		h4p4(6) Personal Informati	h4p4(6) Personal Informati

Document Circulation

No of Copies	Type	Customer Name	Position & Company
1	Electronic	Trility Pty Ltd	) Personal Inf – Administration Officer

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

JUNE 2020 ANNUAL REPORT

Trility Pty Ltd

Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

Table of Contents

Table of Figures

Table of Tables

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.

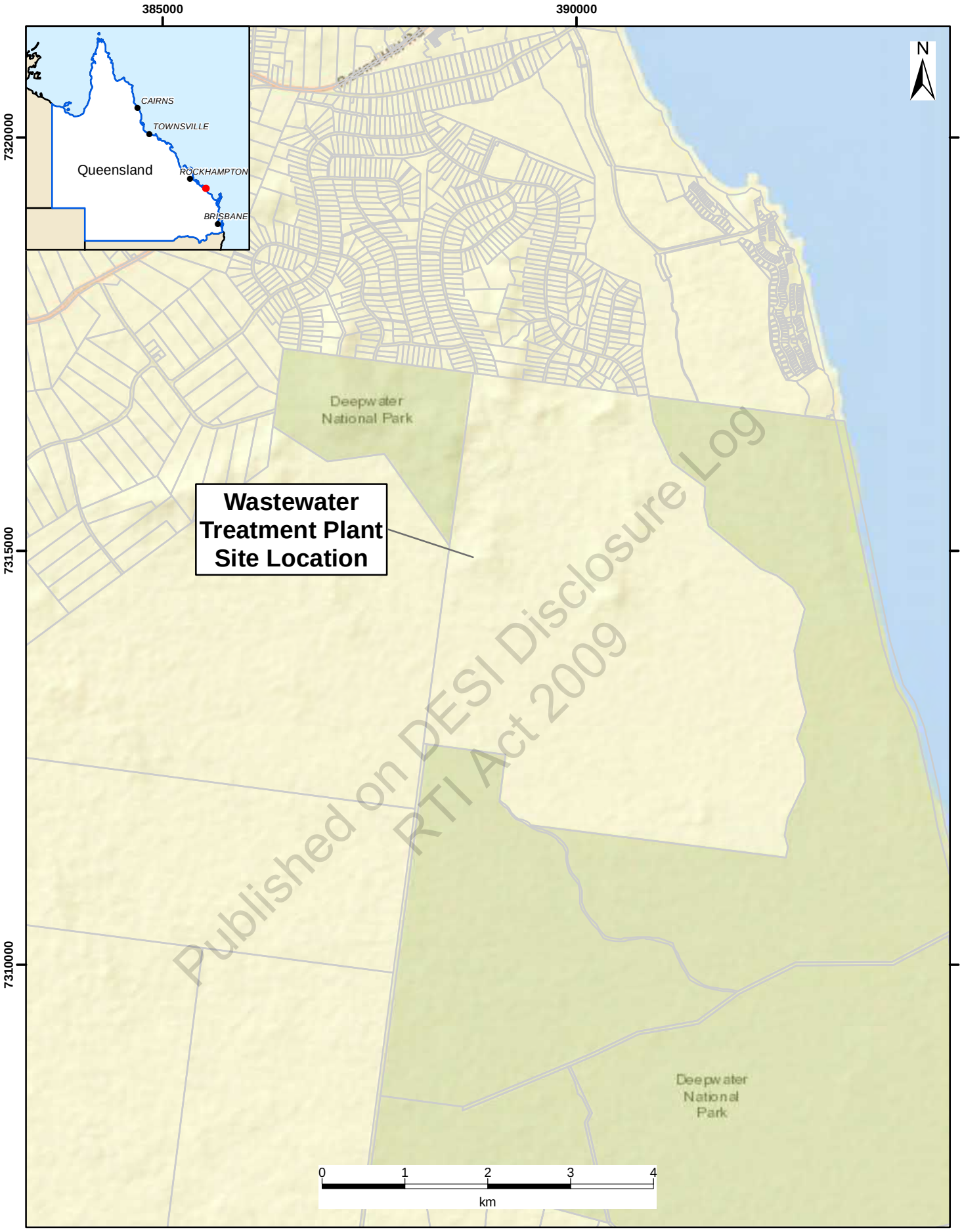
As groundwater flow is inferred as flowing in a southerly direction, impacts from the release of chemicals and/or contaminants on residents drawing water from this aquifer at Agnes Water is unlikely.

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: Personal 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\U143710-01_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.

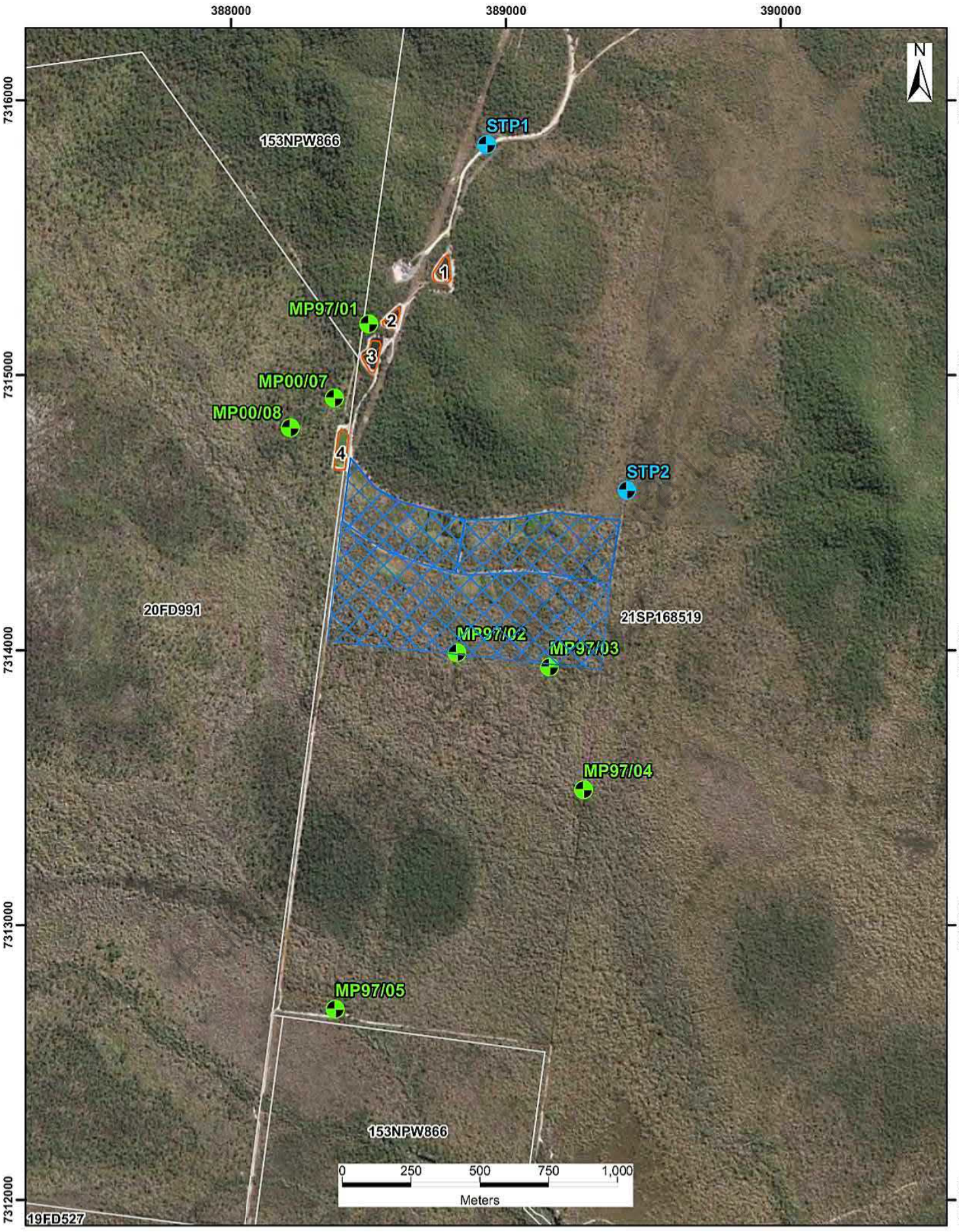
Lot Boundary
Groundwater Bore (Greencap May 2016)
Indicative Location of Treated Water Flush Point
Indicative Location of Brine Pipe
Indicative Location of Seawater Pipe

Location of IWTP Groundwater Bores

Figure 3-1	**Trility Pty Ltd**
Date: 9/07/2018	Author: ersonal 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_QRimxd\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: ersonal
	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 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.

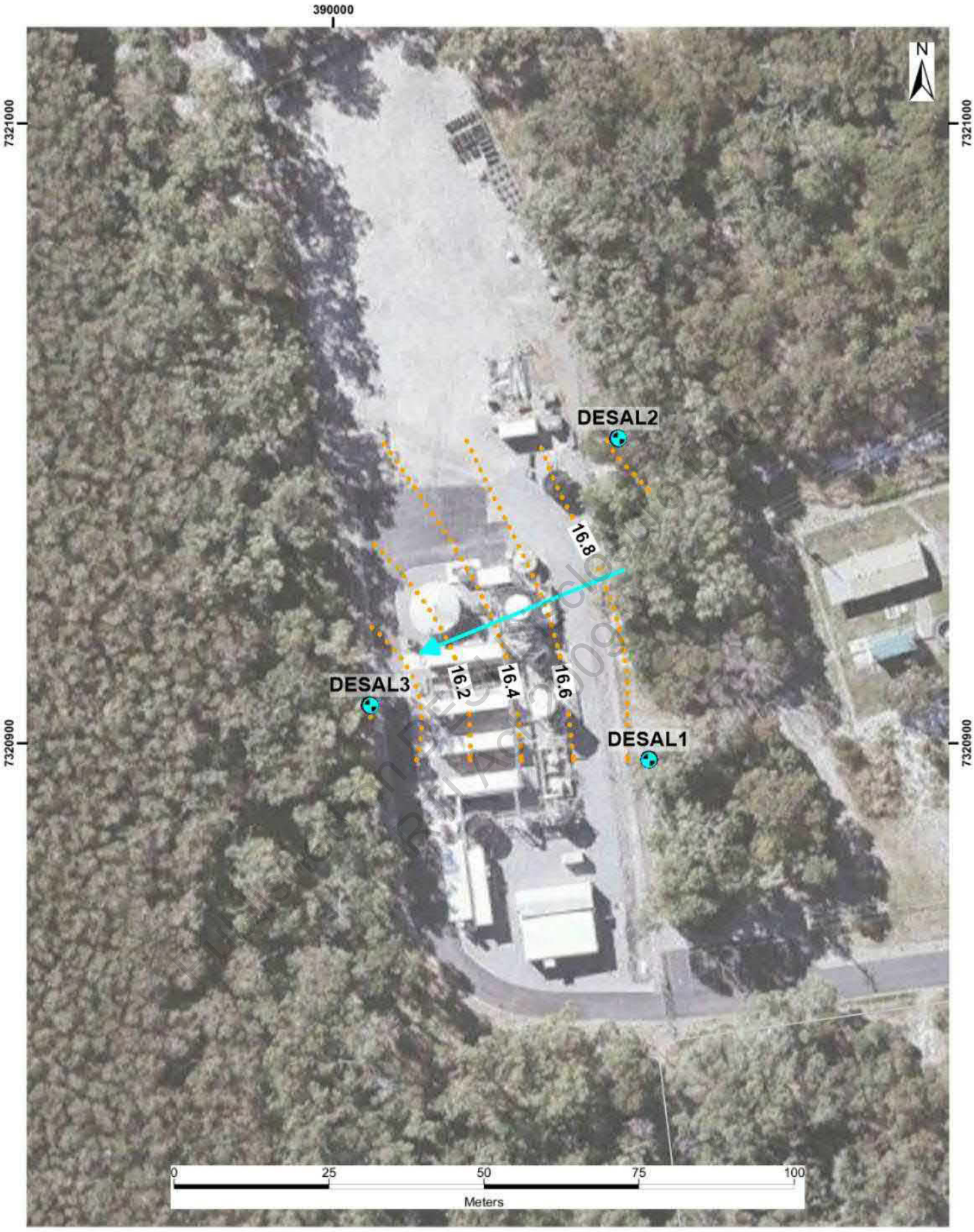
Table 6-3 Groundwater Gauging Data, WwTP July 2019 – June 2020

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

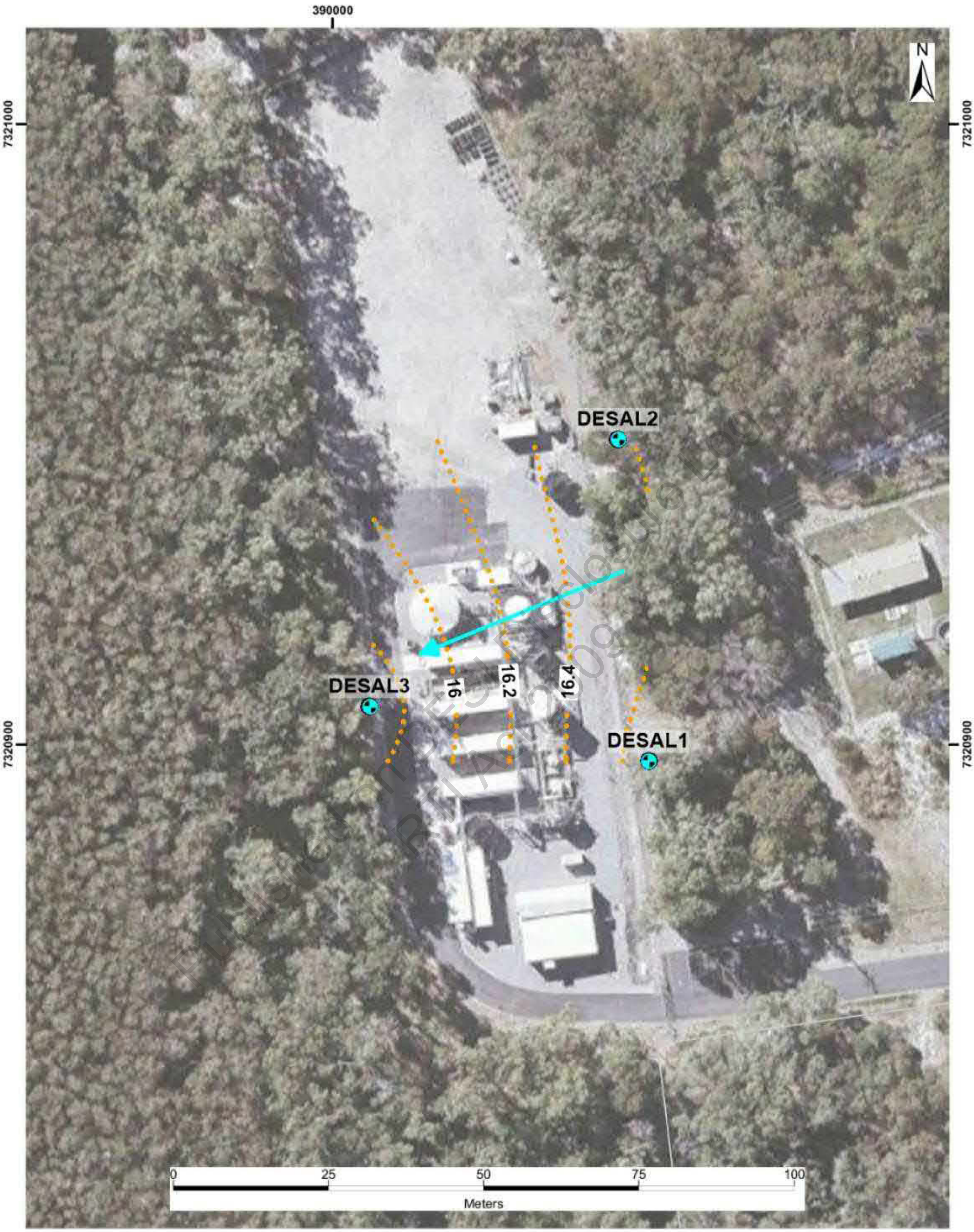
Greencap (May 2016)

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: 1:500
	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP



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: ersonal — GREENCAP

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: ersonal

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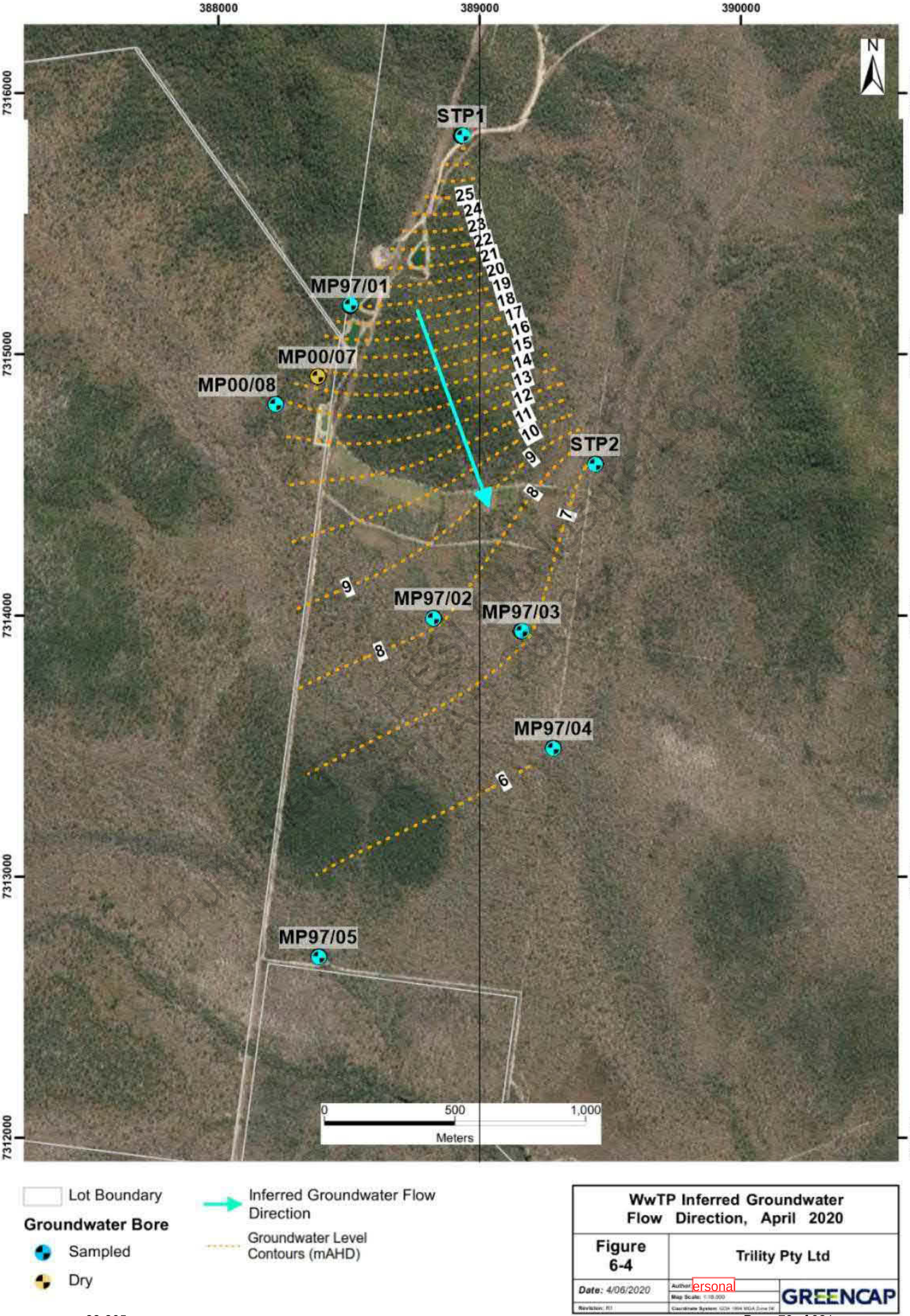

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MP00/07
MP00/08
STP2
MP97/02
MP97/03
MP97/04
MP97/05
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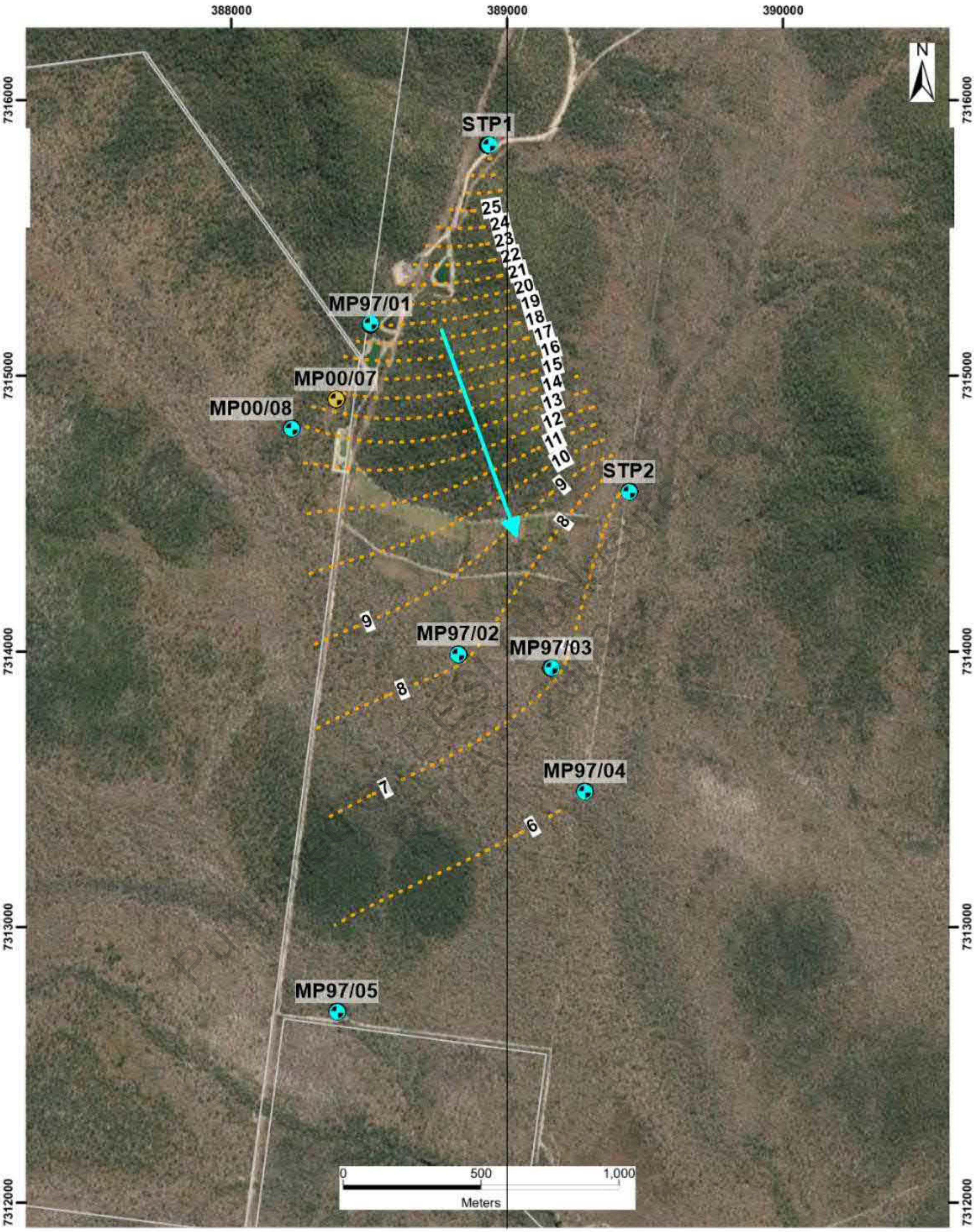
Meters
Lot Boundary
Groundwater Bore
Sampled
Dry
Inferred Groundwater Flow Direction
Groundwater Level Contours (mAHD)
WwTP Inferred Groundwater Flow Direction, April 2020
Figure 6-4
Trility Pty Ltd
Date: 4/06/2020
GREENCAP



Lot Boundary

Groundwater Bore

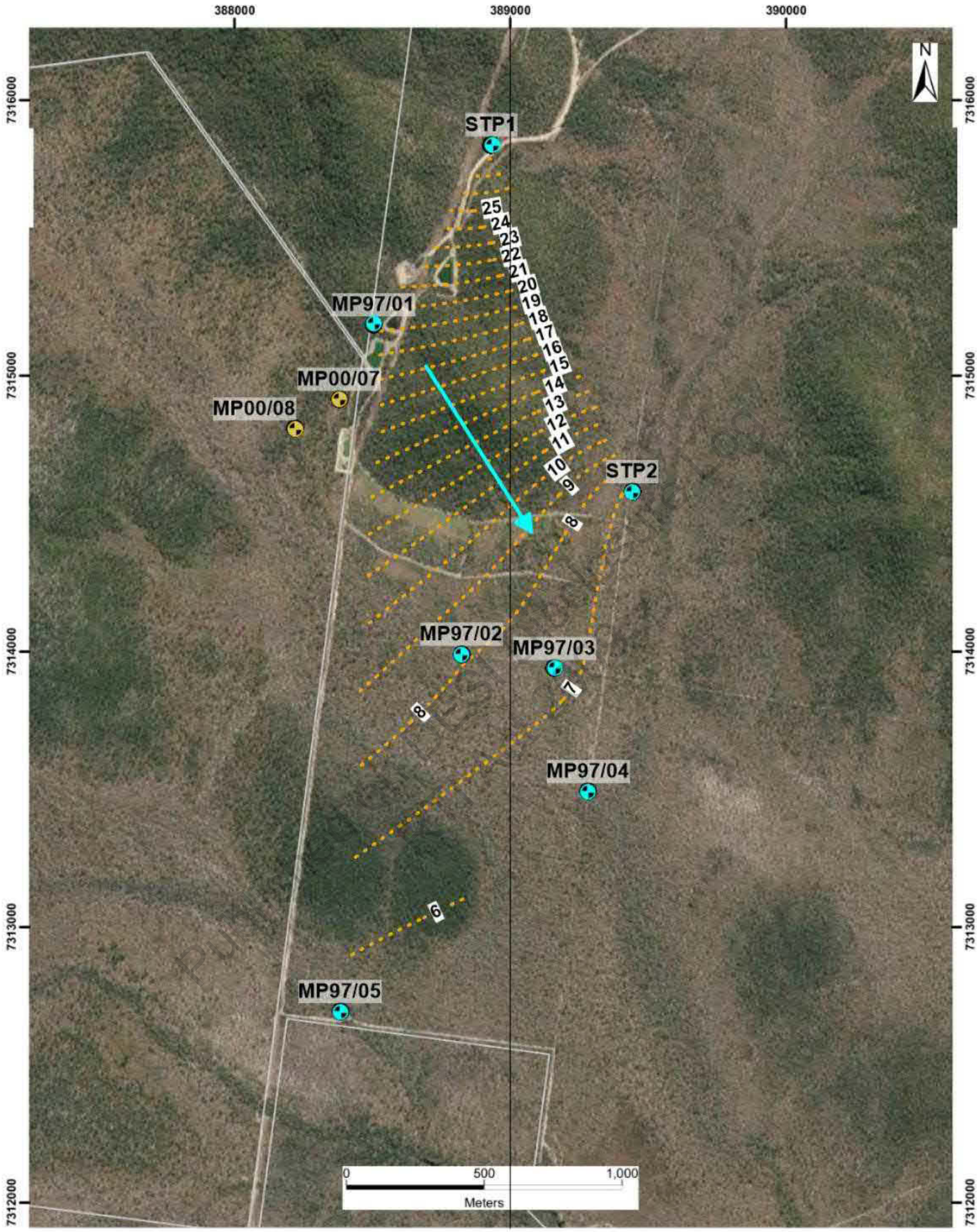
Sampled

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: ersonal
Revision: R1	GREENCAP



Lot Boundary

Groundwater Bore

Sampled

Dry

Inferred Groundwater Flow Direction

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

	Physico-Chemical Parameters				
Monitoring locations	**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.

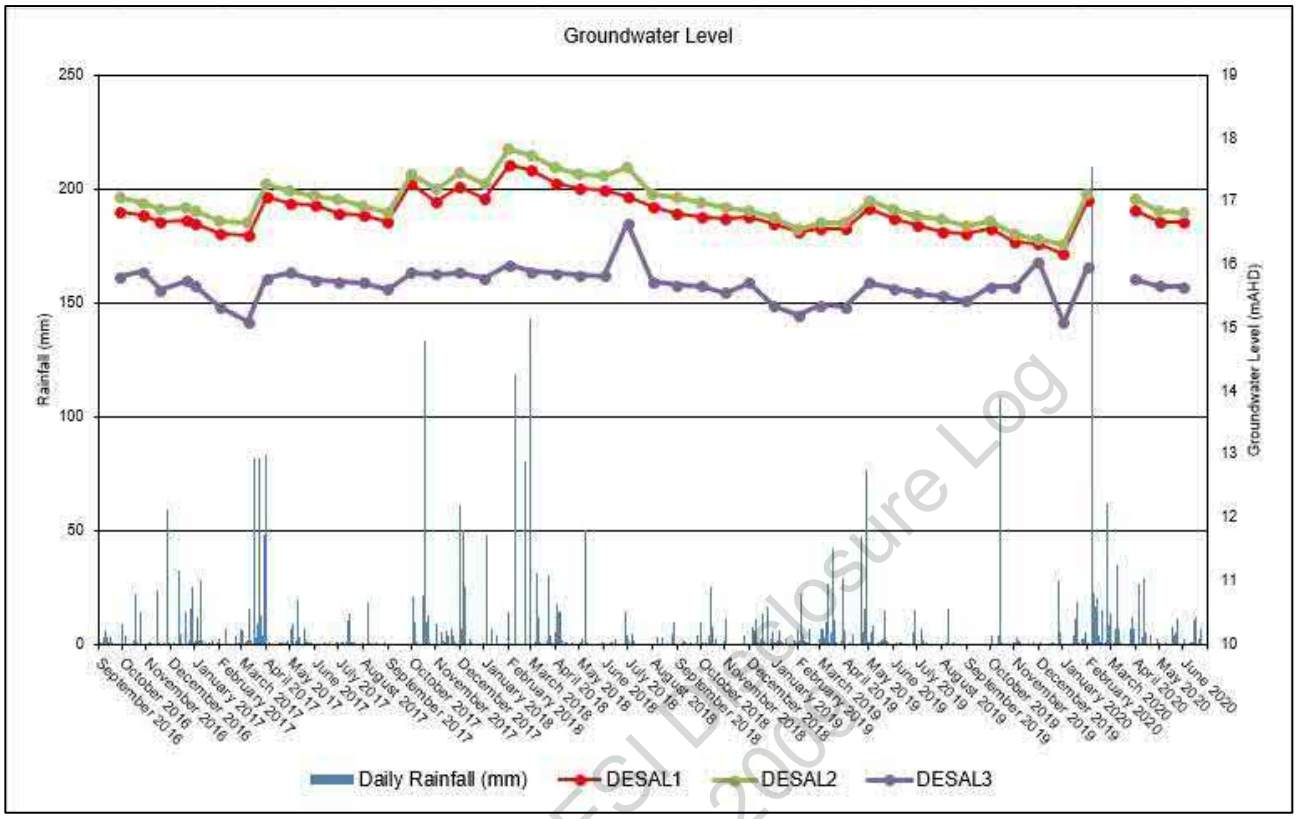


Figure 8-1 IWTP Groundwater Levels, September 2016 – June 2020

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.

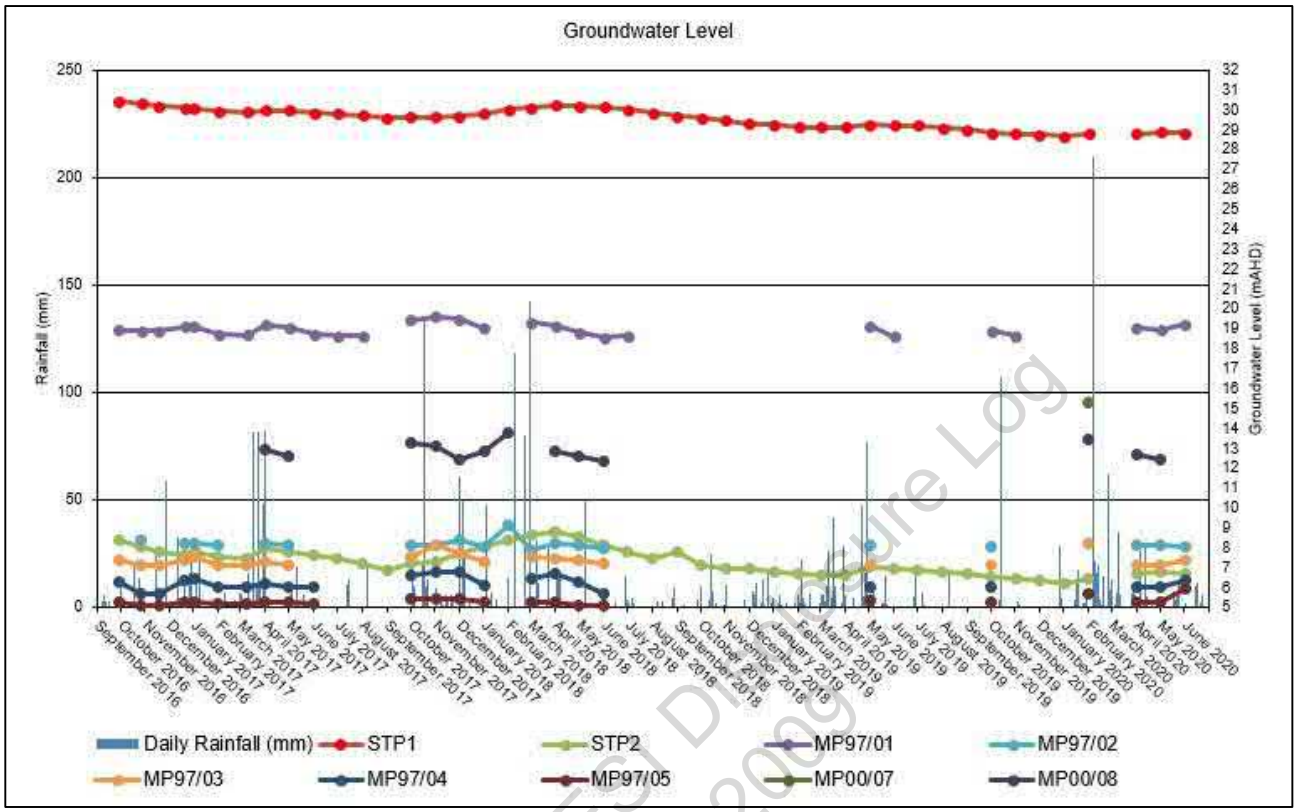


Figure 8-2 WwTP Groundwater Levels, September 2016 – June 2019

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 48 Callemondah Drive Clinton QLD 4680
Ph: 07 4978 7944 E: ALSEnviro.gladstone@alsglobal.com

CLIENT: TRILITY
OFFICE: AGNES WATER
PROJECT: GROUNDWATER MONITORING — PROJECT NO.:
ORDER NUMBER: — PURCHASE ORDER NO.: 4500054738
PROJECT MANAGER:) Personal In — CONTACT PH: (07) 4974 7975
SAMPLER: p4(6) Personal Inform — SAMPLER MOBILE: 4p4(6) Personal Informa
COC Emailed to ALS? (YES / NO) — EDD FORMAT (or default):
Email Reports to : ersona@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

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:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
DATE/TIME: 16.9.19 12.00	DATE/TIME:	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL:

ALS USE ONLY: 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			Additional Information
		16-9-19												Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
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	212	334			
3	DESAL 3	10.40	W		5	X	4.74	25.0	0.15	222	-171.8			
4	DESAL 1 Duplicate	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; 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.

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client: Trility
Project: Groundwater bore installation and sampling
Location: Agnes Water, Qld
Job No:
Sampled by: 4p4(6) Personal Informa
Date: 16-9-19

Desal 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:	PVC	Turbidity Meter:	TM#	
Initial water level:	2627 (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	23·4	0·36	238·0	-	3·90	319	-
8·57	2L	8L	2634	23·4	0·18	240·5	-	3·93	313	-
9·01	2L	10L	2635	23·4	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	
) 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

Field Technician #1

Field Technician #2

REENCAP
adin Point
oundwater Sampling Record

GREENCAP

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

Job No:
Sampled by: 4(6) Personal Inform
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						
isation 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

rvations 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:-

er of well casing:		mm	
er 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)			

echnician #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: p4(6) Personal Inform
Date: 16-9-19

Desel 3

WELL DETAILS			SAMPLING EQUIPMENT	
Well depth:	50 (m)	Sampling device: Peristaltic (low flow)	GEO#	
Well diameter:	50mm	Water meter:	YSI#	PRO ✓
Casing type:	PVC	Turbidity Meter:	TM#	
Initial water level:	3306 (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	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		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	2298	2953
19/5/2017	11:30am		2135	2372	2760
21-6-2017	9.30		2170	2470	2980
20-7-2017	15.40		2290	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		1883	2085	2862
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	4p4(6) Personal Informat	1607	1830	2846
27-4-18	3.30pm		1834	2023	2875
03-5-18	8:15		1912	2123	2896
4-6-18	9.00 a.m		1980	2150	2912
6-7-18	9.10 a.m.		2030	2023	2083
03-8-18	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
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	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	8.30 AM		2582	2832	3227
16.9.19	8.45 AM		2627	2949	3306

GREENCAP

Client: Trility
Project: Groundwater bore installation and sampling
Location: Agnes Water, Qld
Job No:
Sampled by: 6) Personal Info
Date: 16-12-17

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# ✓ PID
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
brown stained.

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

EENCAP
din 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:	6.0 (m)	Sampling device: Peristaltic (low flow)	GEO#	✓ PRO
Well diameter:	50mm	Water meter:	YSI#	
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						
tion 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 ferrous 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)				

NG 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

p4(6) Personal Inform

Client: Trility
Project: Groundwater bore installation and sampling
Location: Agnes Water, Qld
Job No:
Sampled by:
Date: 16-12-19

Desal 3

WELL DETAILS
Well depth: 5.0 (m)
Well diameter: 50mm
Casing type: PVC
Initial water level: 3.697 (m)

SAMPLING EQUIPMENT
Sampling device: Peristaltic (low flow) GEO# ✓
Water meter: YSI# ✓ PRO
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
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	—
10:23	2	6L	2820	26.6	1.48	209	—	4.67	-151	—
10:27	2	8L	2820	26.6	1.50	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
Decontamination 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)				

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

Job No:
Sampled by: h4p4(6) Personal Informati
Date: 15-4-2020

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:	2.243 (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:	
Project:	Groundwater bore installation and sampling	Sampled by:	sch4p4(6) Personal Information
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#	✓
Well diameter:	50mm		Water meter	YSI#	✓ PRO7
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)	0.000000	m3 (kL)	0.00 L per metre
(assuming 30% porosity in sand/gravel pack)			

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

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
18/5/2017	11:30am		2135	2372	2760
21.6.2017	9.30		2170	2470	2980
20-7-2017	15.40		2290	2510	2998
23-8-2017	8.10 AM		2317	2627	3017
27-9-2017	9.10 AM		2425	2718	3120
25/10/2017	3pm		1625	2120	2554
20/11/2017	12pm		2320	2344	2892
14.12.17	8.50		1488	2085	2862
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
03-5-18	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	2572	3072
29-11-18	13:06 pm		2370	2660	3175
18-12-18	9.00 A.M		2265	2682	3016
21-1-19	16:00 pm		2475	2810	3390
28-2-19	10:40 Am		2587	2980	3535
25-3-19	9.00 A.M		2530	2882	3375
16-4-19	8.10 A.M		2547	2889	3401
27.5.19	13.30 p.m		2234	2552	3012
24-6-19	9.00 AM		2380	2681	3180
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
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

GREENCAP
Bladin Point
Groundwater Sampling Record

Client:	Trility	Job No:	4p4(6) Personal Informa
Project:	Groundwater bore Installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	24-6-2020

STP 1

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	15.36 (m)	Sampling device. Peristaltic (low flow)	GEO# ✓
Well diameter:	50mm	Water meter	YSI# PRO+
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	2.225	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
1033	2	2	2335	23.6	3.22	3894		6.67	13.8	
1037	2	4	2368	23.6	2.82	3872		6.67	7.5	
1041	2	6	2394	23.7	2.38	3774		6.67	4.4	
1045	2	8	2414	23.7	2.11	3860		6.67	2.8	
1049	2	10	2431	23.7	1.59	3861		6.67	1.1	
1053	2	12	2448	23.7	1.32	3864		6.67	0	
1057	2	14	2462	23.7	1.22	3866		6.67	-0.1	
1101	2	16	2473	23.7	1.07	3855		6.67	0.2	
1105	2	18	2484	23.7	0.96	3878		6.67	0.4	
1109	2	20	2492	23.7	0.93	3863		6.67	0.5	
1113	2	22	2450	23.7	0.85	3844		6.67	1.0	
				Sample 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

CLEAR, FINE, STILL

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 odour, slightly turbid, clear colour.

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

Client:	Trility	Job No:	ch4p4(6) Personal Informatio
Project:	Groundwater bore Installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	24-6-2020

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:	4.73 (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
0834	2	2	4.510	23.5	0.79	12102		6.52	91.2	
0838	2	4	4.600	23.6	0.99	12069		6.52	69.6	
0843	2	6	4.620	23.6	0.89	12029		6.51	71.2	
0847	2	8	4.628	23.6	0.74	12063		6.51	78.8	
0851	2	10	4.635	23.6	0.66	12033		6.51	79.9	
0855	2	12	4.640	23.6	0.63	12025		6.50	79.6	
0859	2	14	4.645	23.6	0.56	12032		6.50	79.1	
0903	2	16	4.648	23.7	0.56	12031		6.50	77.6	
0908	2	18	4.650	23.8	0.53	11931		6.50	77.6	
0912	2	18	4.650	23.7	0.50	12020		6.50	79.0	
0916	2	20	4.653	23.8	0.49	12069		6.50	80.0	
				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

CLEAR, FINE, STILL

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, slightly turid, 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

Client:	Trility	Job No:	sch4p4(6) Personal Information
Project:	Groundwater bore Installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	24-6-2020

97/1

WELL DETAILS			SAMPLING EQUIPMENT	
Well depth:	1.500	(m)	Sampling device. Peristaltic (low flow)	GEO# ✓
Well diameter:	50mm		Water meter	YSI# PRO +
Casing type:	PVC		Turbidity Meter	TM#
Initial water level:	0.680	(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
0945	2	2	0.690	19.6	2.65	851		5.52	145.6	
0949	2	4	0.694	19.6	2.98	827		5.52	147.1	
0953	2	6	0.693	19.6	2.79	816		5.53	147.7	
0957	2	8	0.695	19.6	2.62	804		5.54	147.8	
1000	2	10	0.695	19.6	2.55	797		5.55	148.2	
1004	2	12	0.695	19.6	2.55	790		5.55	148.5	
1008	2	14	0.695	19.5	2.46	781		5.56	148.1	
			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, CLEAR, STILL.

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 odours, 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)	0.00 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:	23-6-2020

97/2

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	1.70 (m)	Sampling device: Peristaltic (low flow)	GEO# ✓
Well diameter:	50mm	Water meter	YSI#
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	1.30 (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
1040	1	1	DRY							
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

Pumped dry after 1 litre & did not recover.

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

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

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:	23-6-2020

97/3

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	1.64 (m)	Sampling device: Peristaltic (low flow)	GEO# ✓
Well diameter:	50mm	Water meter	YSI#
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	1.60 (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
1056	1.8	1.8	DRY							
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

Pumped dry at 1.8L & did not recover.

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

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

Client:	Trility	Job No:	ch4p4(6) Personal Informatio
Project:	Groundwater bore Installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	23-6-2020

97/4	WELL DETAILS		SAMPLING EQUIPMENT	
	Well depth:	1.57 (m)	Sampling device: Peristaltic (low flow)	GEO# ✓
	Well diameter:	50mm	Water meter	YSI#
	Casing type:	PVC	Turbidity Meter	TM#
	Initial water level:	0.560 (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
1120	2	2	1.300							
1123	1	3	DRY							
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

Pumped dry at 3L & did not recover.

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

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

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

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

Client:	Trility	Job No:	s47F(6) Personal Information
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	23-6-2020

97/5

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	1.02 (m)	Sampling device. Peristaltic (low flow)	GEO# ✓
Well diameter:	50 mm	Water meter	YSI#
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	0.576 (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
1146	2	2	0.780							
1152	1.4	3.4	DRY							
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

Pumped dry at 3.4L & did not recover.

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

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

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:	23-6-2020

00/07

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	1.30 (m)	Sampling device: Peristaltic (low flow)	GEO# ✓
Well diameter:	50mm	Water meter	YSI#
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	DRY (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
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

WELL DRY

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

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

Field Technician #1

Field Technician #2

GREENCAP
Bladin Point
Groundwater Sampling Record

GREENCAP

sch4p4(6) Personal Information

Client:	Trility	Job No:	
Project:	Groundwater bore installation and sampling	Sampled by:	
Location:	Agnes Water, Qld	Date:	23-6-2020

00/08

WELL DETAILS		SAMPLING EQUIPMENT	
Well depth:	1.785 (m)	Sampling device: Peristaltic (low flow)	GEO#
Well diameter:	50mm	Water meter	YSI#
Casing type:	PVC	Turbidity Meter	TM#
Initial water level:	DRY (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
Stabilisation Criteria (3readings within ranges)		N/A	Drawdown <10cm	± 10%	± 10%	± 5%	± 10%	± 0.1	± 10mv	N/A

Field observations: eg. Nearby activities, weather

WELL DRY

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

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

Field Technician #1

Field Technician #2

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Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

Appendix B-1: June 2020 Quarterly Results Summary Table

			Appendix B: Results Summary Table June 2020														
			Field					Inorganics									
			Dissolved Oxygen (DO)	Electrical Conductivity (EC)	pH	Oxidation Reduction Potential (O	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 S
			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
LOR								0.01	1	0.1	0.01	0.01	0.1	0.1	0.01	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
Sample ID	Sampled Date	Lab_Report Number														
STP1	24/06/2020	EB2016812	0.85	3,844	6.67		23.7	0.03	1,020	0.1	<0.01	<0.01	0.1	0.1	0.01	92
STP2	24/06/2020	EB2016812	0.49	12,069	6.5		26.3	0.03	3,850	0.3	<0.01	<0.01	0.4	0.4	0.07	369
STP1 Duplicate	24/06/2020	EB2016812	0.85	3,844	6.67		23.7	0.04	1020	0.1	<0.01	<0.01	0.1	<0.1	0.01	92
DESAL1	22/06/2020	EB2016548	0.18	343.1	4.1		24.5	0.12	77	1.1	0.3	<0.01	1.4	0.3	0.01	<1
DESAL2	22/06/2020	EB2016548	0.32	238.2	4.3		23.8	0.15	52	1	<0.01	<0.01	1	<0.1	0.14	<1
DESAL3	22/06/2020	EB2016548	0.34	202	5.07		26.3	0.47	47	1.2	<0.01	<0.01	1.2	<0.1	0.07	<1
DESAL 1 Duplicate	22/06/2020	EB2016548	0.18	343.1	4.1		24.5	0.13	78	1.1	<0.01	<0.01	1.4	0.31	0.01	<1

			Appendix B: Results Summary Table June 2020																
			Metals																
			Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
			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
LOR			10	10	1	1	50	0.1	0.1	1	1	1	1	1	1	50	50	1	1
		Trigger Criteria	55	55	13	13	No change from background	0.2	0.2	1	1	1.4	1.4	1.4	1.4			3.4	3.4
Sample ID	Sampled Date	Lab_Report Number																	
STP1	24/06/2020	EB2016812	<10	<10	1.0	1.0	<50	<0.1	<0.1	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,660	1,780	<1.0	<1.0
STP2	24/06/2020	EB2016812	<10	<10	2.0	2.0	<50	<0.1	<0.1	<1.0	<1.0	2.0	2.0	<1.0	<1.0	60	50	<1.0	<1.0
STP1 Duplicate	24/06/2020	EB2016812	<10	<10	1	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,630	1,760	<1.0	<1.0
DESAL1	22/06/2020	EB2016548	620	610	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	2.0	170	170	<1.0	<1.0
DESAL2	22/06/2020	EB2016548	620	590	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	0.001	2.0	760	740	<1.0	<1.0
DESAL3	22/06/2020	EB2016548	840	1,000	2	0.0	<50	<0.1	<0.1	3.0	3.0	<1.0	<1.0	<1.0	<1.0	3,000	3,000	<1.0	<1.0
DESAL 1 Duplicate	22/06/2020	EB2016548	0.61	1	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	160	170	<1.0	<1.0

			Appendix B: Results Summary Table June 2020															
			Metals														Microbiological	
			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	cfu/100 ml	cfu/100 ml
LOR			1	1	0.1	0.1	1	1	0.01	0.01	10	10	1	1	5	5	1	1
		Trigger Criteria	1900	1900	0.06	0.06	11	11	0.05	0.05	5	5			8	8	No change from background	No change from background
Sample ID	Sampled Date	Lab_Report Number																
STP1	24/06/2020	EB2016812	1,260	1,380	<0.1	<0.1	12.0	4.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	6.0	<1	<1
STP2	24/06/2020	EB2016812	121	116	<0.1	<0.1	3.0	4.0	0.02	0.02	<10	<10	<1.0	<1.0	17.0	<5.0	<1	<1
STP1 Duplicate	24/06/2020	EB2016812	1,280	1,380	<0.1	<0.1	<1.0	<1.0	<0.01	<0.1	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1
DESAL1	22/06/2020	EB2016548	13.0	14.0	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	7.0	<1	<1
DESAL2	22/06/2020	EB2016548	12.0	26.0	<0.1	<0.1	<1.0	1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	9.0	<1	<1
DESAL3	22/06/2020	EB2016548	23	26	<0.1	<0.1	2.0	2.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1
DESAL 1 Duplicate	22/06/2020	EB2016548	13	13	<0.1	<0.1	1.0	1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1

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Integrated Water Treatment Plant and Wastewater Treatment Plant, Agnes Water

Appendix B-2: IWTP Annual Results Summary Table

Appendix B: Results Summary Table July 2019 to June 2020

			Field					Inorganics								
			Dissolved Oxygen (DO)[1]	Electrical Conductivity (EC)	pH[2]	Oxidation Reduction Potential (C	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 S
			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
			Dissolved Oxygen (DO) (mg/L)	Electrical Conductivity (EC) (µS/cm)	pH (pH_Units)	ion Reduction Potential (OF	Temperature (°C)	mmonia as N (mg/L	hloride (mg/L	jeldahl Nitrogen Total (mg/L	itrate as N) (mg/L	itrite as N) (mg/L	itrogen (Total) (mg/L	xides of Nitrogen (mg/L	otal Phosphorus as P (mg/L	ulphate as S (mg/L
Sample ID	Sampled Date	Lab_Report Number	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 S
DESAL 1	16/09/2019	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
DESAL 1	16/12/2019	EB1933892	0.88	278	3.89	248	25.2	0.14	72	0.8	0.02	<0.01	1	0.02	0.02	<1.0
DESAL 1	15/04/2020	EB2010399	0.32	298.7	3.99	172.4	26.3	0.1	74	1.2	0.76	<0.01	2	0.76	<0.05	<5.0
DESAL 1	24/06/2020	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
DESAL 2	16/09/2019	EB1924392	0.15	212	3.6	334	23	0.1	48	0.7	0.55	<0.01	1.2	0.55	0.01	1
DESAL 2	16/12/2019	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
DESAL 2	15/04/2020	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
DESAL 2	22/06/2020	EB2016548	0.32	238.2	4.3		23.8	0.15	52	1	<0.05	<0.05	1	<0.01	0.14	<5
DESAL 3	16/09/2019	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
DESAL 3	16/12/2019	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
DESAL 3	15/04/2020	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
DESAL 3	24/06/2020	EB2016548	0.34	202	5.07		26.3	0.47	47	1.2	<0.05	<0.05	1.2	<0.01	0.07	<5

Appendix B: Results Summary Table July 2019 to June 2020

			Metals																	
			Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
			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
			luminium (µg/L	luminium (Filtered) (µg/L	rsenic (µg/L	rsenic (Filtered) (µg/L	oron (µg/L	admium (µg/L	admium (Filtered) (µg/L	hromium (III+VI) (µg/L	hromium (III+VI) (Filtered) (µg/L	obalt (µg/L	obalt (Filtered) (µg/L	opper (µg/L	opper (Filtered) (µg/L	ron (µg/L	ron (Filtered) (µg/L	ead (µg/L	ead (Filtered) (µg/L
Sample ID	Sampled Date	Lab_Report Number	Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
DESAL 1	16/09/2019	EB1924392	420	420	<1.0	<1.0	50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	290	250	<1.0	<1
DESAL 1	16/12/2019	EB1933892	560	470	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	240	200	<1.0	<1.0
DESAL 1	15/04/2020	EB2010399	590	480	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	180	140	<1.0	<1.0
DESAL 1	24/06/2020	EB2016548	620	610	<0.001	<0.001	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	2	170	170	<1.0	<1.0
DESAL 2	16/09/2019	EB1924392	350	370	<1.0	<1.0	50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	350	330	<1.0	<1.0
DESAL 2	16/12/2019	EB1933892	510	450	<1.0	<1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	460	390	<1.0	<1.0
DESAL 2	15/04/2020	EB2010399	1350	560	<1.0	<1.0	<50	<0.1	<0.1	3	<1.0	<1.0	<1.0	2	<1.0	670	570	1	<1.0
DESAL 2	22/06/2020	EB2016548	620	590	<0.001	<0.001	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	0.001	2	760	740	<1.0	<1.0
DESAL 3	16/09/2019	EB1924392	1030	800	1	1	<50	<0.1	<0.1	4	3	<1.0	<1.0	2	<1.0	4300	4280	<1.0	<1.0
DESAL 3	16/12/2019	EB1933892	870	1040	2	2	<50	<0.1	<0.1	3	3	<1.0	<1.0	<1.0	1	4290	3860	<1.0	1
DESAL 3	15/04/2020	EB2010399	920	730	1	1	<50	<0.1	<0.1	3	2	<1.0	<1.0	<1.0	<1.0	3990	3710	<1.0	<1.0
DESAL 3	24/06/2020	EB2016548	840	1000	0.002	0.002	<50	<0.1	<0.1	3	3	<1.0	<1.0	<1.0	<1.0	3000	3000	<1.0	<1.0

Appendix B: Results Summary Table July 2019 to June 2020

			Metals														Microbiological	
			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	cfu/100 ml	cfu/100 ml
			Manganese (µg/L)	Manganese (Filtered) (µg/L)	Mercury (µg/L)	Mercury (Filtered) (µg/L)	Nickel (µg/L)	Nickel (Filtered) (µg/L)	Silver (µg/L)	Silver (Filtered) (µg/L)	Selenium (µg/L)	Selenium (Filtered) (µg/L)	Tin (µg/L)	Tin (Filtered) (µg/L)	Zinc (µg/L)	Zinc (Filtered) (µg/L)	E. Coli (cfu/100 ml)	Enterococci (cfu/100 ml)
Sample ID	Sampled Date	Lab_Report Number	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. Coli	Enterococci
DESAL 1	16/09/2019	EB1924392	7	7	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1	<1	<5	<5	<1	<1
DESAL 1	16/12/2019	EB1933892	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	15/04/2020	EB2010399	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	24/06/2020	EB2016548	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 2	16/09/2019	EB1924392	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	16/12/2019	EB1933892	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	15/04/2020	EB2010399	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	22/06/2020	EB2016548	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 3	16/09/2019	EB1924392	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	16/12/2019	EB1933892	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	15/04/2020	EB2010399	28	29	<0.1	<0.1	3	3	0.02	<0.01	<10	<10	<1.0	<1.0	6	8	<1	<1
DESAL 3	24/06/2020	EB2016548	23	26	<0.1	<0.1	2	2	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5	<1	<1

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JUNE 2020
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Appendix B-3: WwTP Annual Results Summary Table

Appendix B: Results Summary Table July 2019 to June 2020

			Field					Inorganics								
			Dissolved Oxygen (DO)[1]	Electrical Conductivity (EC)	pH[2]	Oxidation Reduction Potential ((	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 S
			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
			Dissolved Oxygen (DO) (mg/L)	Electrical Conductivity (EC) (µS/cm)	pH (pH_Units)	ion Reduction Potential (Of	Temperature (°C)	mmonia as N (mg/L	hloride (mg/L	jeldahl Nitrogen Total (mg/L	itrate (as N) (mg/L	itrite (as N) (mg/L	itrogen (Total) (mg/L	xides of Nitrogen (mg/L	otal Phosphorus as P (mg/L	ulphate as S (mg/L
Sample ID	Sampled Date	Lab_Report Number	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 S
STP1	17/09/2019	EB1924565	0.25	3,848	6.68	10.7	23.5	0.05	1,030	<0.1	<0.1	<0.1	<0.1	<0.1	0.01	95
STP1	17/12/2019	EB1934065	2.64	3,648	6.54	2.1	24	0.05	1,020	<0.1	<0.01	<0.01	<0.1	<0.01	0.01	96
STP1	15/04/2020	EB2010933	0.72	3,729	6.71	-16.7	24.1	0.25	1,020	0.3	<0.01	<0.01	0.3	<0.01	0.02	95
STP1	24/06/2020	EB2016812	0.85	3,844	6.67		23.7	0.03	1,020	0.1	<0.01	<0.01	0.1	0.1	0.01	92
STP2	17/09/2019	EB1924565	0.83	12,364	6.5	121	23.3	0.04	3,940	<0.1	<0.1	<0.1	<0.1	<0.1	0.02	375
STP2	17/12/2019	EB1934065	3.24	11,708	6.35	111	23.5	0.01	4,020	<0.1	<0.01	<0.01	<0.1	<0.01	0.02	381
STP2	15/04/2020	EB2010933	1.13	11,732	6.53	85.5	24	0.18	3,850	0.3	<0.01	<0.01	0.3	<0.01	0.04	369
STP2	24/06/2020	EB2016812	0.49	12,069	5.07		26.3	0.03	3,850	0.3	<0.01	<0.01	0.4	0.4	0.07	369

Appendix B: Results Summary Table July 2019 to June 2020

			Metals																	
			Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
			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
			luminium (µg/L)	luminium (Filtered) (µg/L)	rsenic (µg/L)	rsenic (Filtered) (µg/L)	oron (µg/L)	admium (µg/L)	admium (Filtered) (µg/L)	hromium (III+VI) (µg/L)	hromium (III+VI) (Filtered) (µg/L)	obalt (µg/L)	obalt (Filtered) (µg/L)	opper (µg/L)	opper (Filtered) (µg/L)	ron (µg/L)	ron (Filtered) (µg/L)	ead (µg/L)	ead (Filtered) (µg/L)
Sample ID	Sampled Date	Lab_Report Number	Aluminium	Aluminium (Filtered)	Arsenic	Arsenic (Filtered)	Boron	Cadmium	Cadmium (Filtered)	Chromium (III+VI)	Chromium (III+VI) (Filtered)	Cobalt	Cobalt (Filtered)	Copper	Copper (Filtered)	Iron	Iron (Filtered)	Lead	Lead (Filtered)
STP1	17/09/2019	EB1924565	<10	<10	1.0	1.0	80	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,680	1,670	<1.0	<1.0
STP1	17/12/2019	EB1934065	10	<10	1.0	1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,830	1,610	<1.0	<1.0
STP1	15/04/2020	EB2010933	<10	<10	1.0	1.0	<50	<0.1	<0.1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,820	1,570	<1.0	<1.0
STP1	24/06/2020	EB2016812	<10	<10	1.0	1.0	<50	<0.1	<0.1	2.0	<1.0	<1.0	<1.0	<1.0	<1.0	1,660	1,780	<1.0	<1.0
STP2	17/09/2019	EB1924565	<10	<10	1.0	1.0	<50	<0.1	<0.1	<1.0	<1.0	1.0	1.0	<1.0	<1.0	<50	<50	<1.0	<1.0
STP2	17/12/2019	EB1934065	10	<10	1.0	1.0	60	<0.1	<0.1	<1.0	<1.0	1.0	1.0	<1.0	<1.0	<50	<50	<1.0	<1.0
STP2	15/04/2020	EB2010933	<10	<10	1.0	2.0	<50	<0.1	<0.1	<1.0	<1.0	1.0	2.0	<1.0	<1.0	<50	<50	<1.0	<1.0
STP2	24/06/2020	EB2016812	<10	<10	2.0	2.0	<50	<0.1	<0.1	<1.0	<1.0	2.0	2.0	<1.0	<1.0	60	50	<1.0	<1.0

Appendix B: Results Summary Table July 2019 to June 2020

			Metals														Microbiological	
			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	cfu/100 ml	cfu/100 ml
			Manganese (µg/L)	Manganese (Filtered) (µg/L)	Mercury (µg/L)	Mercury (Filtered) (µg/L)	Nickel (µg/L)	Nickel (Filtered) (µg/L)	Silver (µg/L)	Silver (Filtered) (µg/L)	Selenium (µg/L)	Selenium (Filtered) (µg/L)	Tin (µg/L)	Tin (Filtered) (µg/L)	Zinc (µg/L)	Zinc (Filtered) (µg/L)	E. Coli (cfu/100 ml)	Enterococci (cfu/100 ml)
Sample ID	Sampled Date	Lab Report Number	Manganese	Manganese (Filtered)	Mercury	Mercury (Filtered)	Nickel	Nickel (Filtered)	Silver	Silver (Filtered)	Selenium	Selenium (Filtered)	Tin	Tin (Filtered)	Zinc	Zinc (Filtered)	E. Coli	Enterococci
STP1	17/09/2019	EB1924565	1,340	1,310	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP1	17/12/2019	EB1934065	1,350	1,260	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP1	15/04/2020	EB2010933	1,390	1,240	<0.1	<0.1	<1.0	<1.0	<0.01	<0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1
STP1	24/06/2020	EB2016812	1,260	1,380	<0.1	<0.1	12.0	4.0	<0.01	<0.01	<10	<10	<10	<1.0	<5.0	6.0	<1	<1
STP2	17/09/2019	EB1924565	111	126	<0.1	<0.1	3.0	2.0	0.03	0.03	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP2	17/12/2019	EB1934065	109	105	<0.1	<0.1	2.0	2.0	0.03	0.02	<10	<10	<1.0	<1.0	<5.0	<5.0	<1	<1
STP2	15/04/2020	EB2010933	113	111	<0.1	<0.1	3.0	3.0	0.02	0.01	<10	<10	<1.0	<1.0	<5.0	5.0	<1	<1
STP2	24/06/2020	EB2016812	121	116	<0.1	<0.1	3.0	4.0	0.02	0.02	<10	<10	<10	<1.0	17	<5.0	<1	<1

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JUNE 2020
ANNUAL 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	: **EB1924392**	Page	: 1 of 4
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	:) Personal In	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 4974 7975	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 17-Sep-2019 09:05
Order number	: 4500054738	Date Analysis Commenced	: 17-Sep-2019
C-O-C number	: ----	Issue Date	: 23-Sep-2019 17:18
Sampler	:6) Personal Inf		
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. 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.

4(6) Personal Inform	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 the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.
- Microbiological Comment: Membrane filtration result is reported <2 CFU/100mL where 50mL sample was filtered because the sample was turbid, insufficient for filtration at higher volume and there were no target organisms confirmed.
- It is recognised that EG020T (Total Metals) is less than EG020F (Dissolved Metals) 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 (Matrix: WATER)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				16-Sep-2019 09:15	16-Sep-2019 10:00	16-Sep-2019 10:40	16-Sep-2019 09:15	----
				EB1924392-001	EB1924392-002	EB1924392-003	EB1924392-004	--------
				Result	Result	Result	Result	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**2**	**1**	<1	**2**	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**56**	**48**	**56**	**58**	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.42**	**0.37**	**0.80**	**0.42**	----
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	**0.003**	<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	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	**0.003**	<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	**0.007**	**0.006**	**0.036**	**0.007**	----
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	**0.25**	**0.33**	**4.28**	**0.27**	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.42**	**0.35**	**1.03**	**0.53**	----
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	**0.004**	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	**0.002**	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	**0.004**	<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	**0.006**	**0.009**	----
Manganese	7439-96-5	0.001	mg/L	**0.007**	**0.005**	**0.033**	**0.006**	----
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	**0.29**	**0.35**	**4.30**	**0.30**	----
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)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				16-Sep-2019 09:15	16-Sep-2019 10:00	16-Sep-2019 10:40	16-Sep-2019 09:15	----
				EB1924392-001	EB1924392-002	EB1924392-003	EB1924392-004	--------
				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	**0.15**	**0.10**	**0.39**	**0.14**	----
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	**0.11**	**0.55**	<0.01	**0.10**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.11**	**0.55**	<0.01	**0.10**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.7**	**0.7**	**1.5**	**0.8**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**0.8**	**1.2**	**1.5**	**0.9**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.02**	**0.01**	**0.06**	**0.01**	----
EN67: Field Tests								
ø **Electrical Conductivity (Non Compensated)**	----	1	µS/cm	**239**	**212**	**222**	**239**	----
ø **Dissolved Oxygen**	----	0.1	mg/L	**0.13**	**0.15**	**0.15**	**0.13**	----
ø **pH**	----	0.01	pH Unit	**----**	**3.60**	**4.74**	**3.92**	----
ø **Redox Potential**	----	0.1	mV	**306**	**334**	**-171.8**	**306**	----
ø **Temperature**	----	0.1	°C	**23.4**	**23.0**	**25.0**	**23.4**	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<2	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<2	<1	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB1924392**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: 6) Personal Info	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 4974 7975	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 17-Sep-2019
Order number	: 4500054738	Date Analysis Commenced	: 17-Sep-2019
C-O-C number	: ----	Issue Date	: 23-Sep-2019
Sampler	: 6) Personal Info		
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. 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.

4(6) Personal Inform	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 the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2590468)									
EB1924215-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2750	2800	1.77	0% - 20%
EB1924392-004	DESAL 1 Duplicate	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	<1	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2590470)									
EB1924215-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	19700	19800	0.341	0% - 20%
EB1924392-004	DESAL 1 Duplicate	ED045G: Chloride	16887-00-6	1	mg/L	58	58	0.00	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2588924)									
EB1924238-010	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0005	<0.0005	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.012	0.012	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.005	<0.005	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	<0.005	<0.005	0.00	No Limit
		EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.025	<0.025	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.71	0.68	4.37	0% - 50%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.05	<0.05	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.05	0.05	0.00	No Limit
EB1924238-001	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0005	<0.0005	0.00	No Limit
		EG020A-F: Arsenic	7440-38-2	0.001	mg/L	0.010	0.011	0.00	No Limit
		EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.005	<0.005	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	<0.005	<0.005	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report					
				LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2588924) - continued									
EB1924238-001	Anonymous	EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.005	<0.005	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.025	<0.025	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	1.61	1.61	0.00	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.05	<0.05	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: 2588950)									
EB1924238-001	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	0.010	0.011	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	<0.005	<0.005	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	<0.005	<0.005	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.005	<0.005	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	<0.026	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	2.07	2.06	0.632	0% - 20%
		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	2.14	2.13	0.00	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.34	0.18	60.6	No Limit
EB1924238-010	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	0.013	0.013	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	<0.005	<0.005	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	<0.005	<0.005	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.005	<0.005	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	<0.026	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.86	0.84	1.35	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	2.50	2.50	0.00	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.12	0.12	0.00	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 2588927)									
EB1924392-001	DESAL 1	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1924238-001	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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2588954)									
EB1924238-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1924247-001	Anonymous	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: 2588935)									
EB1924392-001	DESAL 1	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: 2588957)									
EB1924392-001	DESAL 1	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: 2589379)									
EB1924227-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.01	<0.01	0.00	No Limit
EB1924417-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2590469)									
EB1924215-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1924392-004	DESAL 1 Duplicate	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: 2589380)									
EB1924227-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EB1924417-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.06	0.06	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2592251)									
EB1900219-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	5.8	6.1	4.11	0% - 20%
EB1924392-001	DESAL 1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.7	0.8	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2592250)									
EB1900219-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.93	0.95	1.84	0% - 20%
EB1924392-001	DESAL 1	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2590468)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	85.0	118
				<1	100 mg/L	100	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 2590470)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	102	90.0	115
				<1	1000 mg/L	104	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 2588924)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.4	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	104	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	111	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	109	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	109	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.1	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	110	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	107	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	103	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	95.7	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	96.6	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 2588950)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	96.4	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	93.1	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	95.6	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	92.0	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	92.4	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	91.6	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.4	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.7	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	95.0	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	# 0.002	0.1 mg/L	99.5	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	91.4	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	96.8	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.3	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	Recovery Limits (%): Low	Recovery Limits (%): High
EG035F: Dissolved Mercury by FIMS (QCLot: 2588927)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2588954)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	101	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2588935)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	94.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2588957)								
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: 2589379)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	102	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2590469)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	103	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2589380)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	95.1	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2592251)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1 mg/L	87.4	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2592250)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.442 mg/L	88.2	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	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2590468)							
EB1924215-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2590470)							
EB1924215-003	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2588924)							
EB1924238-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	101	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	99.2	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	91.5	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	86.7	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	83.7	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020F: Dissolved Metals by ICP-MS (QCLot: 2588924) - continued							
EB1924238-002	Anonymous	EG020A-F: Lead	7439-92-1	1 mg/L	93.0	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	93.5	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	91.4	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	85.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2588950)							
EB1924238-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.6	70.0	130
		EG020A-T: Cadmium	7440-43-9	1.25 mg/L	101	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	92.1	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	90.4	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	88.9	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	95.5	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	93.9	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	87.1	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	90.9	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2588927)							
EB1924238-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	87.0	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2588954)							
EB1924238-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	85.2	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2589379)							
EB1924234-001	Anonymous	EK055G: Ammonia as N	7664-41-7	20 mg/L	93.0	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2590469)							
EB1924215-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	96.4	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2589380)							
EB1924234-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.3	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2592251)							
EB1900219-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	90.8	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2592250)							
EB1900219-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	85.3	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB1924392**	Page	: 1 of 8
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: 6) Personal Inf	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 17-Sep-2019
Site	: ----	Issue Date	: 23-Sep-2019
Sampler	:) Personal Int	No. of samples received	: 4
Order number	: 4500054738	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 Duplicate outliers occur.**
- **NO Laboratory Control outliers occur.**
- **Method Blank value outliers exist - please see following pages for full details.**
- **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
Method Blank (MB) Values							
EG020T: Total Metals by ICP-MS	QC-MRG3-25889490	----	**Tin**	7440-31-5	0.002 mg/L	0.001 mg/L	**Blank result exceeds permitted value**
Matrix Spike (MS) Recoveries							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB1924215--003	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB1924215--003	Anonymous	**Chloride**	16887-00-6	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)								
DESAL 1,	DESAL 2,	**16-Sep-2019**	**----**	----	----	**18-Sep-2019**	14-Oct-2019	✓
DESAL 3,	DESAL 1 Duplicate							
ED045G: Chloride by Discrete Analyser								
Clear Plastic Bottle - Natural (ED045G)								
DESAL 1,	DESAL 2,	**16-Sep-2019**	**----**	----	----	**18-Sep-2019**	14-Oct-2019	✓
DESAL 3,	DESAL 1 Duplicate							
EG020F: Dissolved Metals by ICP-MS								
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)								
DESAL 1,	DESAL 2,	**16-Sep-2019**	**----**	----	----	**19-Sep-2019**	14-Mar-2020	✓
DESAL 3,	DESAL 1 Duplicate							
EG020T: Total Metals by ICP-MS								
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)								
DESAL 1,	DESAL 2,	**16-Sep-2019**	**18-Sep-2019**	14-Mar-2020	✓	**18-Sep-2019**	14-Mar-2020	✓
DESAL 3,	DESAL 1 Duplicate							

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
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**----**	----	----	**19-Sep-2019**	14-Oct-2019	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**----**	----	----	**18-Sep-2019**	14-Oct-2019	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**----**	----	----	**18-Sep-2019**	14-Mar-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**18-Sep-2019**	14-Mar-2020	✓	**18-Sep-2019**	14-Mar-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**----**	----	----	**18-Sep-2019**	14-Oct-2019	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**----**	----	----	**18-Sep-2019**	18-Sep-2019	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**----**	----	----	**18-Sep-2019**	14-Oct-2019	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**19-Sep-2019**	14-Oct-2019	✓	**19-Sep-2019**	14-Oct-2019	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**19-Sep-2019**	14-Oct-2019	✓	**19-Sep-2019**	14-Oct-2019	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**----**	----	----	**17-Sep-2019**	17-Sep-2019	✓

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
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Sep-2019**	**----**	----	----	**17-Sep-2019**	17-Sep-2019	✓

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	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	14	**14.29**	**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	2	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	11	**18.18**	**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	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	11	**18.18**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	**7.14**	**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	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	11	**18.18**	**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	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	**7.14**	**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	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	11	**9.09**	**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	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	**7.14**	**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	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	11	**9.09**	**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	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**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 (2013) 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 21st edition seal method 2 017-1-L april 2003
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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). 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 (2013) 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 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007

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 (2013) 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 (2013) 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 (2013) Schedule B(3)

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB1924565**	Page	: 1 of 4
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: 6) Personal Info	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 4974 7975	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 18-Sep-2019 08:40
Order number	: 45000 54738	Date Analysis Commenced	: 18-Sep-2019
C-O-C number	: ----	Issue Date	: 24-Sep-2019 13:39
Sampler	: 6) Personal Info		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 3		
No. of samples analysed	: 3		

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. 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.

4(6) Personal Inform	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 the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.
- It is recognised that EG020T (Total Metals) is less than EG020F (Dissolved Metals) 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 (Matrix: WATER)				STP1	STP2	STP1 Duplicate	----	----
				17-Sep-2019 10:50	17-Sep-2019 10:10	17-Sep-2019 10:50	----	----
				EB1924565-001	EB1924565-002	EB1924565-010	--------	--------
				Result	Result	Result	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-6	1	mg/L	**95**	**375**	**95**	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**1030**	**3940**	**1030**	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.001**	**0.001**	**0.002**	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	**0.0001**	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.001**	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.002**	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	**0.001**	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----
Manganese	7439-96-5	0.001	mg/L	**1.31**	**0.126**	**1.33**	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Iron	7439-89-6	0.05	mg/L	**1.67**	<0.05	**1.66**	----	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.001**	**0.001**	<0.001	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.001**	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.003**	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----
Manganese	7439-96-5	0.001	mg/L	**1.34**	**0.111**	**1.28**	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Boron	7440-42-8	0.05	mg/L	**0.08**	**0.10**	**0.06**	----	----
Iron	7439-89-6	0.05	mg/L	**1.68**	<0.05	**1.70**	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	STP1 Duplicate	----	----
				17-Sep-2019 10:50	17-Sep-2019 10:10	17-Sep-2019 10:50	----	----
				EB1924565-001	EB1924565-002	EB1924565-010	--------	--------
				Result	Result	Result	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<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	**0.03**	<0.01	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	**0.03**	<0.01	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.05**	**0.04**	**0.06**	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<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	<0.01	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	<0.1	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	<0.1	<0.1	<0.1	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.01**	**0.02**	**0.02**	----	----
EN67: Field Tests								
ø **Electrical Conductivity (Non Compensated)**	----	1	µS/cm	**3848**	**12364**	**3848**	----	----
ø **Dissolved Oxygen**	----	0.1	mg/L	**0.25**	**0.83**	**0.25**	----	----
ø **pH**	----	0.01	pH Unit	**6.68**	**6.50**	**6.68**	----	----
ø **Redox Potential**	----	0.1	mV	**10.7**	**12.1**	**10.7**	----	----
ø **Temperature**	----	0.1	°C	**23.5**	**23.3**	**23.5**	----	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	----	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB1924565**	Page	: 1 of 9
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	:) Personal In	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 4974 7975	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 18-Sep-2019
Order number	: 45000 54738	Date Analysis Commenced	: 18-Sep-2019
C-O-C number	: ----	Issue Date	: 24-Sep-2019
Sampler	:) Personal In		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 3		
No. of samples analysed	: 3		

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. 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 Administration, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Microbiologist	Brisbane Microbiological, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2591587)									
EB1924565-001	STP1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	95	95	0.00	0% - 20%
EB1924575-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2591588)									
EB1924565-001	STP1	ED045G: Chloride	16887-00-6	1	mg/L	1030	1030	0.457	0% - 20%
EB1924575-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	34	34	0.00	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2592075)									
EB1924565-001	STP1	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
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	1.31	1.33	1.51	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	<0.01	<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	1.67	1.67	0.00	0% - 20%
EB1924573-006	Anonymous	EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	0.0002	0.0002	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	0.003	0.003	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	0.009	0.009	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2592075) - continued									
EB1924573-006	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	0.220	0.217	1.23	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.011	0.010	0.00	0% - 50%
		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	0.374	0.381	1.76	0% - 20%
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.03	0.03	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	0.36	0.38	4.24	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 2592122)									
EB1924370-001	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	0.015	0.016	0.00	0% - 50%
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.047	0.049	4.63	0% - 20%
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.016	0.017	0.00	0% - 50%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.012	0.011	0.00	0% - 50%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.011	0.011	0.00	0% - 50%
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	3.76	3.88	2.95	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.028	0.029	0.00	0% - 20%
		EG020A-T: Tin	7440-31-5	0.001	mg/L	0.002	0.002	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.042	0.047	10.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	18.7	19.7	4.94	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	1.19	1.25	4.94	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	99.6	102	2.57	0% - 20%
EB1924558-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0019	0.0018	0.00	0% - 50%
		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	0.007	0.007	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.008	0.008	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	0.140	0.140	0.00	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.007	0.006	0.00	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	0.058	0.058	0.00	0% - 50%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	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	0.94	0.94	0.00	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.47	0.48	0.00	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 2592126)									
EB1924565-002	STP2	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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020T: Total Metals by ICP-MS (QC Lot: 2592126) - continued									
EB1924565-002	STP2	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	0.111	0.109	1.28	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.002	0.00	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	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	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	0.10	0.10	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	<0.05	0.00	No Limit
EB1924573-002	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	0.0003	0.0003	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	0.002	0.002	0.00	No Limit
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	0.028	0.028	0.00	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	0.034	0.034	0.00	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	0.004	0.004	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	6.14	6.30	2.59	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.013	0.013	0.00	0% - 50%
		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	0.603	0.621	2.87	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.40	0.46	13.0	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	0.22	0.23	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.87	0.94	7.91	0% - 50%
EG035F: Dissolved Mercury by FIMS (QC Lot: 2592074)									
EB1924565-010	STP1 Duplicate	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1924558-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2592127)									
EB1924558-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1924565-010	STP1 Duplicate	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: 2591999)									
EB1924565-001	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: 2592009)									
EB1924565-001	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: 2591301)									
EB1918165-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.12	0.11	9.58	0% - 50%
EB1924504-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	4.64	4.56	1.85	0% - 20%

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2591586)									
EB1924565-001	STP1	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1924575-008	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: 2591300)									
EB1918165-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	15.2	16.0	5.44	0% - 20%
EB1924504-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	1.94	1.94	0.00	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2593968)									
EB1924435-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.6	0.6	0.00	No Limit
EB1924573-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.5	<0.5	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2593967)									
EB1924435-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EB1924573-003	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.33	0.31	6.77	No Limit

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2591587)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	103	85.0	118
				<1	100 mg/L	98.5	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 2591588)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	97.4	90.0	115
				<1	1000 mg/L	103	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 2592075)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	94.3	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	107	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.0	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	104	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	105	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	108	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.8	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	103	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	105	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 2592122)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	98.7	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.7	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.4	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	98.2	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	99.0	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.6	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.4	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.0	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	105	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.9	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	96.9	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	103	82.0	118

Sub-Matrix: **WATER**

Method: Compound	CAS Number	LOR	Unit	Method Blank (MB) Report	Laboratory Control Spike (LCS) Report			
					Spike	Spike Recovery (%)	Recovery Limits (%)	
				Result	Concentration	LCS	Low	High
EG020T: Total Metals by ICP-MS (QCLot: 2592126)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	106	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	98.7	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.2	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.0	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	96.7	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.8	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	98.2	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.5	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	94.2	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	93.6	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	107	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	95.8	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	111	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.9	82.0	118
EG035F: Dissolved Mercury by FIMS (QCLot: 2592074)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	112	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2592127)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	101	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2591999)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	99.5	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2592009)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	102	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2591301)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	103	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2591586)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	102	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2591300)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.7	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2593968)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	90.7	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2593967)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	89.9	79.2	105

Matrix Spike (MS) Report

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

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2591587)							
EB1924565-002	STP2	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2591588)							
EB1924565-002	STP2	ED045G: Chloride	16887-00-6	400 mg/L	# Not Determined	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2592075)							
EB1924565-002	STP2	EG020A-F: Arsenic	7440-38-2	1 mg/L	104	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	98.4	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	97.4	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	93.5	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	95.7	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	93.6	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	94.9	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	94.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2592122)							
EB1924370-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	110	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	105	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	104	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	106	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	106	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	96.8	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	103	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	103	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	106	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2592126)							
EB1924565-010	STP1 Duplicate	EG020A-T: Arsenic	7440-38-2	1 mg/L	97.7	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	98.5	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	96.0	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	98.8	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	90.3	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	105	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	108	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	89.9	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	93.4	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2592074)							
EB1924558-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	96.3	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2592127)							
EB1924558-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	89.8	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2591301)							
EB1919652-001	Anonymous	EK055G: Ammonia as N	7664-41-7	40 mg/L	102	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2591586)							
EB1924565-002	STP2	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	99.4	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2591300)							
EB1919652-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	2 mg/L	112	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2593968)							
EB1924435-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	96.3	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2593967)							
EB1924435-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	98.2	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB1924565**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	:) Personal In	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 18-Sep-2019
Site	: ----	Issue Date	: 24-Sep-2019
Sampler	:) Personal In	No. of samples received	: 3
Order number	: 45000 54738	No. of samples analysed	: 3

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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB1924565--002	STP2	**Sulfate as SO4 - Turbidimetric**	14808-79-8	Not Determined	----	**MS recovery not determined, background level greater than or equal to 4x spike level.**
ED045G: Chloride by Discrete Analyser	EB1924565--002	STP2	**Chloride**	16887-00-6	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, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**18-Sep-2019**	15-Oct-2019	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**18-Sep-2019**	15-Oct-2019	✓
EG020F: Dissolved Metals by ICP-MS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**19-Sep-2019**	15-Mar-2020	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**19-Sep-2019**	15-Mar-2020	✓	**19-Sep-2019**	15-Mar-2020	✓
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**20-Sep-2019**	15-Oct-2019	✓

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, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**20-Sep-2019**	15-Oct-2019	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**20-Sep-2019**	15-Mar-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**20-Sep-2019**	15-Mar-2020	✓	**20-Sep-2019**	15-Mar-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**18-Sep-2019**	15-Oct-2019	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**18-Sep-2019**	19-Sep-2019	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**18-Sep-2019**	15-Oct-2019	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**20-Sep-2019**	15-Oct-2019	✓	**20-Sep-2019**	15-Oct-2019	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**20-Sep-2019**	15-Oct-2019	✓	**20-Sep-2019**	15-Oct-2019	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**18-Sep-2019**	18-Sep-2019	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
STP1, STP2, STP1 Duplicate	**17-Sep-2019**	**----**	----	----	**18-Sep-2019**	18-Sep-2019	✓

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	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**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	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.50**	**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	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	4	30	**13.33**	**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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	16	**12.50**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	30	**6.67**	**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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	**33.33**	**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	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.25**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	30	**6.67**	**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	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**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	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	16	**6.25**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	30	**6.67**	**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 (2013) 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 21st edition seal method 2 017-1-L april 2003
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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). 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 (2013) 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 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007

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 (2013) 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 (2013) 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 (2013) Schedule B(3)

24/9

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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CLIENT: TRILITY
OFFICE: AGNES WATER
PROJECT: GROUNDWATER MONITORING **PROJECT NO.:**
ORDER NUMBER: **PURCHASE ORDER NO.:** 45000 54738
PROJECT MANAGER: Personal In
SAMPLER: ch4p4(6) Personal Informatio
CONTACT PH: (07) 4974 7975
SAMPLER MOBILE: 4p4(6) Personal Informat
COC Emailed to ALS? (YES / NO) (YES circled)
EDD FORMAT (or default):
Email Reports to : rsona@TRILITY.com.au; agneswatergroup@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

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:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
	(6) Personal Infor		
DATE/TIME: 17-9-19 12.00	DATE/TIME: 18/9 8:40	DATE/TIME:	DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Please email results also to; czipf@trility.com.au; dmcconnell@trility.com.au; rrupp@trility.com.au; mhills@trility.com.au

Environmental Division
Brisbane
Work Order Reference
EB1924565

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 su... Where Metals are required, specify Total (unfiltered bottle required) or Dissolved (field filtered bottle req...						
LAB ID	SAMPLE ID	DATE / TIME 17-9-19	MATRIX	TYPE & PRESERVATIVE (refer to codes below)	TOTAL BOTTLES	TABLE 1	pH Field	D.O Field	Temp Field	Cond Field	ORP Field	
1	STP1	10.50	W		5	X	6.68	0.25	23.5	3848	10.7	
2	STP2	10.10	W		5	X	6.50	0.83	23.3	12364	121	
3	97-01											Well Dry
4	97-2											Well Dry
5	97-3											Well Dry
6	97-4											Well Dry
7	97-5											Well Dry
8	007											Well Dry
9	008											Well Dry.
10	STP1 Duplicate	10.50	W		5	X	6.68	0.25	23.5	3848	10.7	
				TOTAL	15							

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.

22-265

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB1933892**	Page	: 1 of 4
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	(6) Personal Info	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 4974 7975	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 17-Dec-2019 09:55
Order number	: 4500056728	Date Analysis Commenced	: 17-Dec-2019
C-O-C number	: ----	Issue Date	: 30-Dec-2019 16:00
Sampler	:6) Personal Inf		
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. 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.

4(6) Personal Inform	Microbiologist	Brisbane Microbiological, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Assistant Laboratory Manager	Brisbane Sampling, Stafford, QLD
	Senior Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.
- It is recognised that EG020-T (Total Metals by ICP-MS) is less than EG020-F (Dissolved Metals by ICP-MS) for sample DESAL 3 (EB1933892-003). 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.
- Sampling of waters conducted in accordance with AS5667 and in-house EN/67B.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				16-Dec-2019 00:00	16-Dec-2019 00:00	16-Dec-2019 00:00	16-Dec-2019 00:00	----
				EB1933892-001	EB1933892-002	EB1933892-003	EB1933892-004	--------
				Result	Result	Result	Result	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-1	1	mg/L	<1	<1	<1	<1	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**71**	**46**	**54**	**72**	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.47**	**0.45**	**1.04**	**0.48**	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	**0.002**	<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	**0.003**	<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	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	**0.003**	<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	**0.006**	**0.006**	**0.030**	**0.006**	----
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	**0.20**	**0.39**	**3.86**	**0.21**	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.56**	**0.51**	**0.87**	**0.62**	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	**0.002**	<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	**0.003**	<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	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	**0.003**	<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	**0.007**	**0.008**	----
Manganese	7439-96-5	0.001	mg/L	**0.007**	**0.007**	**0.033**	**0.008**	----
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	**0.24**	**0.46**	**4.29**	**0.27**	----
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)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				16-Dec-2019 00:00	16-Dec-2019 00:00	16-Dec-2019 00:00	16-Dec-2019 00:00	----
				EB1933892-001	EB1933892-002	EB1933892-003	EB1933892-004	--------
				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	**0.12**	**0.08**	**0.38**	**0.14**	----
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	**0.02**	**0.07**	<0.01	**0.02**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.02**	**0.07**	<0.01	**0.02**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.8**	**1.2**	**1.6**	**1.0**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**0.8**	**1.3**	**1.6**	**1.0**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.02**	**0.10**	**0.09**	**0.02**	----
EN67: Field Tests								
pH	----	0.01	pH Unit	**3.89**	**3.71**	**4.72**	**3.89**	----
Electrical Conductivity (Non Compensated)	----	0.1	µS/cm	**278**	**194**	**208**	**278**	----
Dissolved Oxygen	----	0.01	% saturation	**0.88**	**0.98**	**1.51**	**0.88**	----
Temperature	----	0.1	°C	**25.2**	**23.9**	**26.6**	**25.2**	----
Redox Potential	----	0.1	mV	**248**	**292**	<0.1	**248**	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	<1	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB1933892**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	:) Personal In	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 4974 7975	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 17-Dec-2019
Order number	: 4500056728	Date Analysis Commenced	: 17-Dec-2019
C-O-C number	: ----	Issue Date	: 30-Dec-2019
Sampler	: 6) Personal Info		
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. 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.

4(6) Personal Inform	Microbiologist	Brisbane Microbiological, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Assistant Laboratory Manager	Brisbane Sampling, Stafford, QLD
	Senior Chemist	Brisbane Inorganics, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2771161)									
EB1933809-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.00	No Limit
EB1933914-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	3	3	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2771159)									
EB1933809-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2390	2360	1.08	0% - 20%
EB1933914-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	42	42	0.00	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2772369)									
EB1933866-001	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	0.005	0.006	17.0	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	0.002	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
EB1933898-007	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	0.005	0.005	0.00	No Limit
		EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	0.00	No Limit

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2772369) - continued									
EB1933898-007	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	0.254	0.260	2.32	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	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	3.37	3.42	1.50	0% - 20%
EG020T: Total Metals by ICP-MS (QC Lot: 2772375)									
EB1933866-001	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	<0.001	<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	0.014	0.014	0.00	0% - 50%
		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	0.006	0.006	0.00	No Limit
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.007	0.007	0.00	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	0.012	0.010	15.0	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.10	0.12	0.00	0% - 50%
		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	0.54	0.57	5.67	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.16	0.17	0.00	No Limit
EB1933898-007	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	0.001	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	0.005	0.005	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	0.287	0.277	3.35	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	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	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	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	0.38	0.38	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	3.62	3.46	4.33	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 2772372)									
EB1933866-001	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1933898-007	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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2772374)									
EB1933866-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1933898-004	Anonymous	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: 2787095)									
EB1933892-001	DESAL 1	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: 2772275)									
EB1933892-001	DESAL 1	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: 2771465)									
EB1933665-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.04	24.2	No Limit
EB1933843-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.15	0.16	8.27	0% - 50%
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2771160)									
EB1933809-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1933914-005	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: 2771466)									
EB1933665-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	4.02	4.07	1.13	0% - 20%
EB1933843-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	6.18	6.30	2.04	0% - 20%
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2780179)									
EB1933892-001	DESAL 1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.8	0.8	0.00	No Limit
ET1903895-003	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.4	2.4	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2780178)									
EB1933892-001	DESAL 1	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.02	0.02	0.00	No Limit
ET1903895-003	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.44	0.43	0.00	No Limit

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2771161)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	95.1	85.0	118
				<1	100 mg/L	100	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 2771159)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	100	90.0	115
				<1	1000 mg/L	100	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 2772369)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	100	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.5	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.9	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	112	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	101	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.6	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	103	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	103	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	105	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	103	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 2772375)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	103	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	101	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	99.0	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	108	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	104	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	98.0	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	111	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	97.9	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	107	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	111	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.9	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	114	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	Recovery Limits (%): Low	Recovery Limits (%): High
EG035F: Dissolved Mercury by FIMS (QCLot: 2772372)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	101	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2772374)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	100	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2787095)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	84.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2772275)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	92.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2771465)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	114	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2771160)								
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: 2771466)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	104	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2780179)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	90.1	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2780178)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	97.5	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	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2771161)							
EB1933914-003	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	96.7	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2771159)							
EB1933914-003	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	114	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2772369)							
EB1933866-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	93.4	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	98.0	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	91.9	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	96.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	98.4	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	90.2	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	90.6	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2772369) - continued							
EB1933866-002	Anonymous	EG020A-F: Nickel	7440-02-0	1 mg/L	95.3	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	103	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2772375)							
EB1933866-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	101	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	103	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	103	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	100	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	101	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	102	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	106	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	100	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	104	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2772372)							
EB1933866-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	96.8	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2772374)							
EB1933866-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	99.8	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2771465)							
EB1933666-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	96.0	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2771160)							
EB1933914-003	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	99.8	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2771466)							
EB1933666-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	95.3	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2780179)							
EB1933892-002	DESAL 2	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	110	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2780178)							
EB1933892-002	DESAL 2	EK067G: Total Phosphorus as P	----	1 mg/L	104	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB1933892**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	:(6) Personal Infor	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 17-Dec-2019
Site	: ----	Issue Date	: 30-Dec-2019
Sampler	:6) Personal Info	No. of samples received	: 4
Order number	: 4500056728	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.**
- **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 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)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**18-Dec-2019**	13-Jan-2020	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**18-Dec-2019**	13-Jan-2020	✓
EG020F: Dissolved Metals by ICP-MS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**19-Dec-2019**	13-Jun-2020	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**20-Dec-2019**	13-Jun-2020	✓	**20-Dec-2019**	13-Jun-2020	✓
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**19-Dec-2019**	13-Jan-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**20-Dec-2019**	13-Jan-2020	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**27-Dec-2019**	13-Jun-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**27-Dec-2019**	13-Jun-2020	✓	**27-Dec-2019**	13-Jun-2020	✓

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
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**17-Dec-2019**	13-Jan-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**18-Dec-2019**	18-Dec-2019	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**17-Dec-2019**	13-Jan-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**23-Dec-2019**	13-Jan-2020	✓	**23-Dec-2019**	13-Jan-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**23-Dec-2019**	13-Jan-2020	✓	**23-Dec-2019**	13-Jan-2020	✓
EN67: Field Tests							
Clear Plastic Bottle - Natural (EN67)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**18-Dec-2019**	----	----
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**17-Dec-2019**	17-Dec-2019	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**16-Dec-2019**	**----**	----	----	**17-Dec-2019**	17-Dec-2019	✓

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	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	19	**10.53**	**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	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	2	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	**5.26**	**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	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	**5.26**	**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	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	19	**5.26**	**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	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Kjeldahl Nitrogen as N By Discrete Analyser	EK061G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Mercury by FIMS	EG035T	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**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 (2013) 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 21st edition seal method 2 017-1-L april 2003
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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). 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 (2013) Schedule B(3)
Field Tests	EN67	WATER	Field determinations as per methods described in APHA. The analysis is performed in the field by ALS samplers. ALS NATA accreditation applies for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007

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 (2013) 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 (2013) 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 (2013) Schedule B(3)

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com

BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com

GLADSTONE 48 Callemondah Drive Clinton QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.gladstone@alsglobal.com

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NEWCASTLE 5 Rose Gum Road Wattlebeach NSW 2324 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com

NOWRA 4/12 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com

PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7555 E: samples.perth@alsglobal.com

Environmental Division Brisbane

Work Order Reference

EB1933892

Telephone : + 61-7-3243 7222

CLIENT: TRILITY	TURNAROUND REQUIREMENTS : ☐ Standard TAT (List due date):	FOR LA	
OFFICE: AGNES WATER	(Standard TAT may be longer for some tests e.g., Ultra Trace Organics) ☐ Non Standard or urgent TAT (List due date):	Custody S	N/A
PROJECT: GROUNDWATER MONITORING PROJECT NO.:	ALS QUOTE NO.: BN/222/16	Free ice / receipt?	N/A
ORDER NUMBER: PURCHASE ORDER NO.: AS000576978	COUNTRY OF ORIGIN:	Random	
PROJECT MANAGER: GLEN ZIPF	CONTACT PH: (07) 4974 7975	Other con	
SAMPLER: 4(6) Personal Inform	SAMPLER MOBILE: 4p4(6) Personal Informa	RECEIVED BY: 6) Personal Info	RELINQUISH
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default):		
Email Reports to : rsona@TRILITY.com.au; awatergroup@trility.com.au	DATE/TIME: 16-12-19	DATE/TIME: 17/12 9:55	DATE/TIME:
Email Invoice to (will default to PM if no other addresses are listed): accountspayable@trility.com.au	27/09/2016 12:00 pm	27/09/2016	

COC SEQUENCE NUMBER (Circle)

COC:	1	2	3	4	5	6	7
OF:	1	2	3	4	5	6	7

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	DEP Field			Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	DESAL 1		W		5	X	3.89	25.2	0.88	278	248			
2	DESAL 2		W		5	X	3.71	23.9	0.98	194	297			
3	DESAL 3		W		5	X	4.72	26.6	1.51	208	-155			
4	DESAL 1 Duplicate		W		5	X	3.89	25.2	0.88	278	248			
				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; AB = 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	: **EB1934065**	Page	: 1 of 4
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: 6) Personal Info	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: 07 4974 7975	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 18-Dec-2019 10:50
Order number	: 4500056928	Date Analysis Commenced	: 18-Dec-2019
C-O-C number	: ----	Issue Date	: 06-Jan-2020 14:15
Sampler	:) Personal Int		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 3		
No. of samples analysed	: 3		

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. 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.

4(6) Personal Infor	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Sampling, Stafford, QLD
	Microbiologist	Brisbane Microbiological, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- Sampling of waters conducted in accordance with AS5667 and in-house EN/67B.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	STP1 Duplicate	----	----
				17-Dec-2019 10:30	17-Dec-2019 09:45	17-Dec-2019 10:30	----	----
				EB1934065-001	EB1934065-002	EB1934065-003	--------	--------
				Result	Result	Result	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**95**	**381**	**96**	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**1020**	**4020**	**1010**	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.001**	**0.001**	**0.001**	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.001**	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.002**	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----
Manganese	7439-96-5	0.001	mg/L	**1.26**	**0.105**	**1.28**	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Iron	7439-89-6	0.05	mg/L	**1.61**	<0.05	**1.65**	----	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.01**	**0.01**	**0.03**	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.001**	**0.001**	**0.001**	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.001**	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.002**	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----
Manganese	7439-96-5	0.001	mg/L	**1.35**	**0.109**	**1.31**	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	**0.06**	<0.05	----	----
Iron	7439-89-6	0.05	mg/L	**1.83**	<0.05	**1.82**	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	STP1 Duplicate	----	----
				17-Dec-2019 10:30	17-Dec-2019 09:45	17-Dec-2019 10:30	----	----
				EB1934065-001	EB1934065-002	EB1934065-003	--------	--------
				Result	Result	Result	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<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	**0.02**	<0.01	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	**0.03**	<0.01	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.05**	**0.01**	**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	----	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	<0.1	**0.1**	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	<0.1	<0.1	**0.1**	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.01**	**0.02**	**0.01**	----	----
EN67: Field Tests								
pH	----	0.01	pH Unit	**6.54**	**6.35**	**6.54**	----	----
Electrical Conductivity (Non Compensated)	----	0.1	µS/cm	**3650**	**11700**	**3650**	----	----
Dissolved Oxygen	----	0.01	% saturation	**2.64**	**3.24**	**2.64**	----	----
Temperature	----	0.1	°C	**24.0**	**23.5**	**24.0**	----	----
Redox Potential	----	0.1	mV	**2.1**	**111**	**2.1**	----	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	----	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	----	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB1934065**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: (3) Personal Inf	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
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Project	: GROUNDWATER MONITORING	Date Samples Received	: 18-Dec-2019
Order number	: 4500056928	Date Analysis Commenced	: 18-Dec-2019
C-O-C number	: ----	Issue Date	: 06-Jan-2020
Sampler	: (3) Personal Inf		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 3		
No. of samples analysed	: 3		

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. 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 Sampling, Stafford, QLD
	Microbiologist	Brisbane Microbiological, Stafford, QLD

General Comments

The analytical procedures used by the Environmental Division have been developed from established internationally recognized procedures such as those published by the USEPA, APHA, AS and NEPM. In house developed procedures are employed in the absence of documented standards or by 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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2773614)									
EB1934074-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	83	82	1.47	0% - 20%
EB1934011-005	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	78	80	2.47	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 2773615)									
EB1934074-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	82	82	0.00	0% - 20%
EB1934011-005	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	619	623	0.581	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2775286)									
EB1934028-018	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	0.047	0.046	0.00	0% - 20%
		EG020A-F: Lead	7439-92-1	0.001	mg/L	0.002	0.001	0.00	No Limit
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.012	0.011	0.00	0% - 50%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.010	0.010	0.00	0% - 50%
		EG020A-F: Tin	7440-31-5	0.001	mg/L	0.003	0.004	0.00	No Limit
		EG020A-F: Zinc	7440-66-6	0.005	mg/L	0.048	0.047	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.16	0.15	0.00	0% - 50%
		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
EB1934075-007	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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2775286) - continued									
EB1934075-007	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	0.002	0.002	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: 2775290)									
EB1933803-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.1 µg/L	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<1 µg/L	<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	4 µg/L	0.004	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<1 µg/L	<0.001	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	1170 µg/L	1.17	0.00	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	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	6 µg/L	0.006	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<10 µg/L	<0.01	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	1.67	1.65	0.797	0% - 20%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	2130 µg/L	2.09	1.76	0% - 20%
EB1933803-010	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.1 µg/L	<0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<1 µg/L	<0.001	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	0.002	0.002	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	9 µg/L	0.010	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	3 µg/L	0.003	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	27 µg/L	0.028	0.00	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.00	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	12 µg/L	0.014	16.2	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	40 µg/L	0.06	29.4	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	0.29	0.30	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	130 µg/L	0.17	29.3	No Limit
EG035F: Dissolved Mercury by FIMS (QC Lot: 2775287)									
EB1934028-018	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB1934075-007	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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2775293)									
EB1933803-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.5 µg/L	<0.0005	0.00	No Limit
EB1933803-011	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.1 µg/L	<0.0001	0.00	No Limit
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QC Lot: 2775411)									
EB1934065-001	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: 2775143)									
EB1934065-001	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: 2776021)									
EB1934011-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.40	0.40	0.00	0% - 20%
EB1934075-001	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: 2773613)									
EB1933761-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB1934011-005	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: 2776022)									
EB1934011-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.05	0.05	0.00	No Limit
EB1934075-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.03	0.03	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2783909)									
EB1933876-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.7	3.1	13.8	No Limit
EB1934011-006	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	42.8	44.8	4.64	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2783908)									
EB1933876-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	5.01	5.16	2.97	0% - 20%
EB1934011-006	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	3.37	3.49	3.37	0% - 20%

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2773614)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	97.7	85.0	118
				<1	100 mg/L	102	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 2773615)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.3	90.0	115
				<1	1000 mg/L	102	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 2775286)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	97.0	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	99.5	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	97.4	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	93.2	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	96.6	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	96.7	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	96.6	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	96.3	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	96.0	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	102	86.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.9	87.0	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.4	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 2775290)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	104	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	98.7	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	99.8	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	104	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	99.9	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	102	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	103	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	96.1	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	106	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	108	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	Recovery Limits (%): Low	Recovery Limits (%): High
EG035F: Dissolved Mercury by FIMS (QCLot: 2775287)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	104	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2775293)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	102	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2775411)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	84.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2775143)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	99.8	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2776021)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	105	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2773613)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	98.8	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2776022)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	96.4	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2783909)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1 mg/L	88.2	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2783908)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.442 mg/L	95.4	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	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2773614)							
EB1934011-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	93.8	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2773615)							
EB1934011-002	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	75.5	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2775286)							
EB1934047-003	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	96.1	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	96.1	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	95.6	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	100	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	95.4	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	94.6	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	99.1	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*Concentration*	*MS*	*Low*	*High*
EG020F: Dissolved Metals by ICP-MS (QCLot: 2775286) - continued							
EB1934047-003	Anonymous	EG020A-F: Nickel	7440-02-0	1 mg/L	97.0	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	99.0	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2775290)							
EB1933803-002	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	102	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	100	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	97.9	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	96.2	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	90.0	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	93.4	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	98.2	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	89.8	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	89.0	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2775287)							
EB1934065-001	STP1	EG035F: Mercury	7439-97-6	0.01 mg/L	96.9	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2775293)							
EB1933803-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	94.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2776021)							
EB1934011-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	# Not Determined	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2773613)							
EB1934011-002	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	98.3	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2776022)							
EB1934011-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	94.0	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2783909)							
EB1933878-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	25 mg/L	84.9	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2783908)							
EB1933878-001	Anonymous	EK067G: Total Phosphorus as P	----	5 mg/L	98.5	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB1934065**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: 6) Personal Inf	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 18-Dec-2019
Site	: ----	Issue Date	: 06-Jan-2020
Sampler	: 6) Personal Inf	No. of samples received	: 3
Order number	: 4500056928	No. of samples analysed	: 3

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							
EK055G: Ammonia as N by Discrete Analyser	EB1934011--002	Anonymous	**Ammonia as N**	7664-41-7	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, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**18-Dec-2019**	14-Jan-2020	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**18-Dec-2019**	14-Jan-2020	✓
EG020F: Dissolved Metals by ICP-MS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**23-Dec-2019**	14-Jun-2020	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**21-Dec-2019**	14-Jun-2020	✓	**21-Dec-2019**	14-Jun-2020	✓
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**24-Dec-2019**	14-Jan-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**23-Dec-2019**	14-Jan-2020	✓

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
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**30-Dec-2019**	14-Jun-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**21-Dec-2019**	14-Jun-2020	✓	**21-Dec-2019**	14-Jun-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**19-Dec-2019**	14-Jan-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**18-Dec-2019**	19-Dec-2019	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**19-Dec-2019**	14-Jan-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**27-Dec-2019**	14-Jan-2020	✓	**27-Dec-2019**	14-Jan-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**27-Dec-2019**	14-Jan-2020	✓	**27-Dec-2019**	14-Jan-2020	✓
EN67: Field Tests							
Clear Plastic Bottle - Natural (EN67)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**18-Dec-2019**	----	----
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**18-Dec-2019**	18-Dec-2019	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
STP1, STP2, STP1 Duplicate	**17-Dec-2019**	**----**	----	----	**18-Dec-2019**	18-Dec-2019	✓

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	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	**33.33**	**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	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**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	20	**10.00**	**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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	14	**14.29**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	**33.33**	**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	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	14	**14.29**	**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	20	**5.00**	**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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	**33.33**	**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	3	**33.33**	**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	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**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	20	**5.00**	**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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	14	**7.14**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	16	**6.25**	**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	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	14	**7.14**	**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	20	**5.00**	**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 (2013) 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 21st edition seal method 2 017-1-L april 2003
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 (2013) 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 (2013) Schedule B(3)
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	WATER	In house: Referenced to APHA 3125; USEPA SW846 - 6020 Samples are 0.45µm filtered prior to analysis. The ORC-ICPMS technique removes interfering species through a series of chemical reactions prior to ion detection. Ions are passed into a high vacuum mass spectrometer, which separates the analytes based on their distinct mass to charge ratios prior to measurement by a discrete dynode ion detector. This method is compliant with NEPM (2013) Schedule B(3)
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). 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 (2013) Schedule B(3)
Field Tests	EN67	WATER	Field determinations as per methods described in APHA. The analysis is performed in the field by ALS samplers. ALS NATA accreditation applies for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007

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 (2013) 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 (2013) 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 (2013) Schedule B(3)

CHAIN OF CUSTODY

ALS Laboratory: please tick →

WORKORDER No: EB1934065

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NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4935 9433 E: samples.newcastle@alsglobal.com
NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
PERTH 10 Hod Way Malaga WA 6090 Ph: 08 9209 7655 E: samples.perth@alsglobal.com
SYDNEY 277-289 Woodpark Road Smithfield NSW 2164 Ph: 02 8784 8555 E: samples.sydney@alsglobal.com

Environmental Division
Brisbane
Work Order Reference
EB1934065

Telephone : + 61-7-3243 7222

CLIENT:	TRILITY	TURNAROUND REQUIREMENTS : (Standard TAT may be longer for some tests e.g., Ultra Trace Organics)	☐ Standard TAT (List due date):	FOR	
OFFICE:	AGNES WATER		☐ Non Standard or urgent TAT (List due date):	Custo	
PROJECT:	GROUNDWATER MONITORING PROJECT NO.:	ALS QUOTE NO.:	BN/222/16	Free i receip	N/A
ORDER NUMBER:	PURCHASE ORDER NO.: 45000 56928	COUNTRY OF ORIGIN:		Rand	N/A
PROJECT MANAGER:	GLEN ZIPF	CONTACT PH: (07) 4974 7975	COC SEQUENCE NUMBER (Circle) COC: 1 2 3 4 5 6 7 OF: 1 2 3 4 5 6 7	Other	
SAMPLER:	4(6) Personal Inforn	SAMPLER MOBILE: 4p4(6) Personal Informa	RELINQUISHED BY: 6) Personal Info	RECEIVED BY: p4(6) Personal Inform	ELINQUI
COC Emailed to ALS? (YES / NO)		EDD FORMAT (or de...)	DATE/TIME: 17-12-19 12:00	DATE/TIME: 18-12-19 10:50	DATE/TIME
Email Reports to:	ersona@TRILITY.com.au; agneswatergroup@trility.com.au				
Email Invoice to (will default to PM if no other addresses are listed):	accountspayable@trility.com.au				

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: ~~Please email results also to:~~ rson2@trility.com.au; Personal @trility.com.au; rson2@trility.com.au; ersona@trility.com.au

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	DO Field	Temp Field	Cond Field	ORP Field		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc.
1	STP1	17-12-19											
2	STP2	10:30	W		5	X	6.54	2.64	24.0	3648	2.1		
3	~~97-01~~	9:45	W		5	X	6.35	3.24	23.5	11708	111		
4	~~97-2~~		W	Well Dry		X							
5	~~97-3~~		W	Well Dry		X							
6	~~97-4~~		W	Well Dry		X							
7	97-5		W	Well Dry		X							
8	007		W	Well Dry		X							
9	008		W	Well Dry		X							
10	STP1 Duplicate	10:30	W			X							
					5	X	6.54	2.69	24.0	3648	2.1		
				TOTAL	15	File B							

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 = 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 = Sodium Thiosulphate Preserved; AV = Airfreight Unpreserved Vial Acetate Preserved Bottle; E = EDTA Preserved Bottles; ST = Sterile Bottle; ASS = Plastic Bag for Acid Sulphate Soils; B = Unpreserved Bag; LI = Lugols Iodine

MICRO LAB

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2010399**	Page	: 1 of 4
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: h4p4(6) Personal Informatic	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 08 84086500	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 16-Apr-2020 09:00
Order number	: 4500059581	Date Analysis Commenced	: 16-Apr-2020
C-O-C number	: ----	Issue Date	: 23-Apr-2020 15:18
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. 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.

4(6) Personal Inform	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): Sample EB2010399_001 (DESAL 1) was 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 samples DESAL 2 (EB2010399-002) and DESAL 3 (EB2010399-003). However, the difference is within experimental variation of the methods.
- ED041G (Sulfate as SO4): Some samples were diluted due to matrix interference. LOR adjusted accordingly.
- 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)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 (Duplicate)	----
				15-Apr-2020 12:05	15-Apr-2020 10:50	15-Apr-2020 09:20	15-Apr-2020 12:10	----
				EB2010399-001	EB2010399-002	EB2010399-003	EB2010399-004	--------
				Result	Result	Result	Result	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	**2**	<1	<5	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**72**	**81**	**60**	**74**	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.48**	**0.56**	**0.73**	**0.51**	----
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	**0.002**	<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	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.001**	**0.003**	<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	**0.007**	**0.008**	<0.005	----
Manganese	7439-96-5	0.001	mg/L	**0.008**	**0.028**	**0.029**	**0.008**	----
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	**0.14**	**0.57**	**3.71**	**0.16**	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.59**	**1.35**	**0.92**	**0.60**	----
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	**0.003**	**0.003**	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	**0.002**	<0.001	<0.001	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.002**	**0.003**	<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	**0.006**	<0.005	**0.006**	**0.006**	----
Manganese	7439-96-5	0.001	mg/L	**0.008**	**0.030**	**0.028**	**0.008**	----
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	**0.18**	**0.67**	**3.99**	**0.18**	----
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)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 (Duplicate)	----
				15-Apr-2020 12:05	15-Apr-2020 10:50	15-Apr-2020 09:20	15-Apr-2020 12:10	----
				EB2010399-001	EB2010399-002	EB2010399-003	EB2010399-004	--------
				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	**0.04**	**0.02**	<0.01	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.10**	**0.10**	**0.50**	**0.13**	----
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	**0.76**	**0.03**	<0.01	**0.73**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.76**	**0.03**	<0.01	**0.73**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**1.2**	**1.3**	**1.6**	**1.2**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**2.0**	**1.3**	**1.6**	**1.9**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	<0.05	**0.10**	**0.21**	**0.07**	----
EN67: Field Tests								
ø **Electrical Conductivity (Non Compensated)**	----	1	µS/cm	**298.7**	**313.6**	**219.0**	**298.7**	----
ø **Dissolved Oxygen**	----	0.1	mg/L	**0.32**	**0.31**	**0.44**	**0.32**	----
ø **pH**	----	0.01	pH Unit	**3.99**	**3.92**	**4.82**	**3.99**	----
ø **Temperature**	----	0.1	°C	**26.3**	**24.8**	**27.6**	**26.3**	----
ø **Reactive Phosphorus as P**	14265-44-2	0.01	mg/L	**172.4**	**180.6**	**-177.7**	**172.4**	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	<1	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2010399**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	:ch4p4(6) Personal Informatio	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: +61 08 84086500	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 16-Apr-2020
Order number	: 4500059581	Date Analysis Commenced	: 16-Apr-2020
C-O-C number	: ----	Issue Date	: 23-Apr-2020
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. 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 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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 2973523)									
EB2010268-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	658000 µg/L	656	0.270	0% - 20%
EB2010399-001	DESAL 1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	<5	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 2973525)									
EB2010399-001	DESAL 1	ED045G: Chloride	16887-00-6	1	mg/L	72	73	0.00	0% - 20%
EB2010545-009	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	2420	2440	0.643	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2972357)									
EB2008355-001	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	0.002	0.002	0.00	No Limit
		EG020A-F: Cobalt	7440-48-4	0.001	mg/L	0.006	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	1.03	1.01	2.16	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	0.018	0.019	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	0.10	0.10	0.00	No Limit
EB2010262-001	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

Sub-Matrix: **WATER**

Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Laboratory Duplicate (DUP) Report LOR	Unit	Original Result	Duplicate Result	RPD (%)	Recovery Limits (%)
EG020F: Dissolved Metals by ICP-MS (QC Lot: 2972357) - continued									
EB2010262-001	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	0.115	0.114	0.00	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	<0.01	<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: 2972363)									
EB2010188-005	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	<0.001	<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	0.005	0.005	0.00	No Limit
		EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.010	<0.010	0.00	No Limit
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	<0.001	0.00	No Limit
		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	<0.001	<0.001	0.00	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	0.01	<0.01	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	<0.10	<0.10	0.00	No Limit
EB2010262-002	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	0.002	0.002	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	0.050	0.050	0.00	0% - 20%
		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	31.5	31.5	0.0606	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.002	0.002	0.00	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	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	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	3.70	3.71	0.478	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 2972358)									
EB2010378-004	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2008355-001	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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 2972368)									
EB2008355-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2010085-004	Anonymous	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: 2972289)									
EB2010399-001	DESAL 1	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: 2972282)									
EB2010399-001	DESAL 1	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: 2977961)									
EB2010399-001	DESAL 1	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.10	0.09	0.00	No Limit
EB2010482-005	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.06	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 2973522)									
EB2010268-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<10 µg/L	<0.01	0.00	No Limit
EB2010399-001	DESAL 1	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: 2977962)									
EB2010399-001	DESAL 1	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.76	0.72	4.65	0% - 20%
EB2010482-005	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QC Lot: 2976603)									
EB2010376-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	2.7	2.3	15.9	No Limit
EB2010394-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	31.1	30.5	2.03	0% - 20%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 2976602)									
EB2010376-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	1.35	1.31	2.78	0% - 20%
EB2010394-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	3.51	3.26	7.45	0% - 20%

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2973523)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	107	85.0	118
				<1	100 mg/L	104	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 2973525)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	98.6	90.0	115
				<1	1000 mg/L	102	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 2972357)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	100	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	100	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.2	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	102	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	100	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	97.6	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	97.0	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.5	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	99.3	86.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.3	87.0	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	102	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 2972363)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	95.9	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	100	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	101	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	97.3	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	99.2	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	95.2	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	95.7	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	98.9	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.0	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	97.9	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	108	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	98.1	84.0	114
EG020A-T: Boron	7440-42-8	0.05	mg/L	<0.05	0.5 mg/L	91.7	82.0	128
EG020A-T: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	96.0	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	Recovery Limits (%): Low	Recovery Limits (%): High
EG035F: Dissolved Mercury by FIMS (QCLot: 2972358)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	103	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2972368)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	118	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 2972289)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	90.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 2972282)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	106	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2977961)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	102	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2973522)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	90.0	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2977962)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	99.0	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2976603)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	88.5	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2976602)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	92.4	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	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 2973523)							
EB2010268-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1000 mg/L	92.5	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 2973525)							
EB2010399-002	DESAL 2	ED045G: Chloride	16887-00-6	400 mg/L	107	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 2972357)							
EB2008355-002	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	101	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	97.3	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	92.3	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	94.6	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	94.1	70.0	130
		EG020A-F: Manganese	7439-96-5	1 mg/L	95.4	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 2972357) - continued							
EB2008355-002	Anonymous	EG020A-F: Nickel	7440-02-0	1 mg/L	93.1	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	98.8	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 2972363)							
EB2010188-006	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	96.7	70.0	130
		EG020A-T: Cadmium	7440-43-9	0.25 mg/L	98.6	70.0	130
		EG020A-T: Chromium	7440-47-3	1 mg/L	105	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	108	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	105	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	107	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	106	70.0	130
		EG020A-T: Nickel	7440-02-0	1 mg/L	99.4	70.0	130
		EG020A-T: Zinc	7440-66-6	1 mg/L	95.7	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 2972358)							
EB2008355-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	88.1	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 2972368)							
EB2008355-002	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	82.1	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 2977961)							
EB2010399-002	DESAL 2	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	87.6	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 2973522)							
EB2010268-002	Anonymous	EK057G: Nitrite as N	14797-65-0	4 mg/L	96.1	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 2977962)							
EB2010399-002	DESAL 2	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	89.6	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 2976603)							
EB2010393-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	86.8	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 2976602)							
EB2010393-001	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	97.3	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2010399**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	ch4p4(6) Personal Informatio	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 16-Apr-2020
Site	: ----	Issue Date	: 23-Apr-2020
Sampler	:4p4(6) Personal Informa	No. of samples received	: 4
Order number	: 4500059581	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.**
- **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 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)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**17-Apr-2020**	13-May-2020	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**17-Apr-2020**	13-May-2020	✓
EG020F: Dissolved Metals by ICP-MS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)							
DESAL 2, DESAL 3	**15-Apr-2020**	**----**	----	----	**20-Apr-2020**	12-Oct-2020	✓
Clear Plastic Bottle - Natural (EG020A-F)							
DESAL 1, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**20-Apr-2020**	12-Oct-2020	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**21-Apr-2020**	12-Oct-2020	✓	**21-Apr-2020**	12-Oct-2020	✓
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)							
DESAL 2, DESAL 3	**15-Apr-2020**	**----**	----	----	**20-Apr-2020**	13-May-2020	✓
Clear Plastic Bottle - Natural (EG035F)							
DESAL 1, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**20-Apr-2020**	13-May-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**21-Apr-2020**	13-May-2020	✓
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF)							
DESAL 2, DESAL 3	**15-Apr-2020**	**----**	----	----	**20-Apr-2020**	12-Oct-2020	✓
Clear Plastic Bottle - Natural (EG094-AgF)							
DESAL 1, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**20-Apr-2020**	12-Oct-2020	✓

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
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**20-Apr-2020**	12-Oct-2020	✓	**20-Apr-2020**	12-Oct-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**21-Apr-2020**	13-May-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**17-Apr-2020**	17-Apr-2020	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**21-Apr-2020**	13-May-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**21-Apr-2020**	13-May-2020	✓	**21-Apr-2020**	13-May-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**21-Apr-2020**	13-May-2020	✓	**21-Apr-2020**	13-May-2020	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**16-Apr-2020**	16-Apr-2020	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 (Duplicate)	**15-Apr-2020**	**----**	----	----	**16-Apr-2020**	16-Apr-2020	✓

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	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	18	**11.11**	**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	2	20	**10.00**	**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	18	**11.11**	**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	19	**10.53**	**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	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.56**	**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	1	20	**5.00**	**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	18	**5.56**	**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	19	**5.26**	**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	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.56**	**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	1	20	**5.00**	**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	18	**5.56**	**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	19	**5.26**	**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	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	18	**5.56**	**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	1	20	**5.00**	**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	18	**5.56**	**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	19	**5.26**	**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 (2013) 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 21st edition seal method 2 017-1-L april 2003
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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). 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 (2013) 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 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007

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 (2013) 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 (2013) 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 (2013) Schedule B(3)

23/4

CHAIN OF CUSTODY

ALS Laboratory: please tick →

ALS

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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):	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.: 4500059581	COUNTRY OF ORIGIN:	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER: (6) Personal Infor	CONTACT PH: DL: +61 7 49757975 | M: 6) Personal Info	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: 6) Personal Info	SAMPLER MOBILE: Personal In	RELINQUISHED BY: ch4p4(6) Personal Information	RECEIVED BY: (6) Personal Info
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default):	DATE/TIME: 15/04/2020 1400	DATE/TIME: 16/4/2020 9:00
Email Reports to : DMcConnell; 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 µS/cm	ORP Field	Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please add field results to COA
1	DESAL 1	15/04/2020 1205	W		5	X	3.99	26.3	0.32	298.7	172.4	
2	DESAL 2	15/04/2020 1050	W		5	X	3.92	24.8	0.31	313.6	180.6	
3	DESAL 3	15/04/2020 0920	W		5	X	4.82	27.6	0.44	219.0	-177.7	
4	DESAL 1 (Duplicate)	15/04/2020 1210	W		5	X	3.99	26.3	0.32	298.7	172.4	
				TOTAL	20							

Environmental Division
Brisbane
Work Order Reference
EB2010399

Telephone : +61-7-3243 7222

MICT 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; 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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2010933**	Page	: 1 of 4
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: 4(6) Personal Infor	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 22-Apr-2020 08:10
Order number	: 4500059581	Date Analysis Commenced	: 22-Apr-2020
C-O-C number	: ----	Issue Date	: 28-Apr-2020 10:40
Sampler	: 4p4(6) Personal Informa		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 3		
No. of samples analysed	: 3		

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. 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.

4(6) Personal Infor	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Sampling, 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.

- 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.
- 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.
- MW023 is ALS's internal code and is equivalent to AS4276.9.
- MW006 is ALS's internal code and is equivalent to AS4276.7.
- Sampling of waters conducted in accordance with AS5667 and in-house EN/67B.

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	STP1 Duplicate	----	----
				21-Apr-2020 10:15	21-Apr-2020 11:20	21-Apr-2020 10:20	----	----
				EB2010933-001	EB2010933-002	EB2010933-003	--------	--------
				Result	Result	Result	----	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-6	1	mg/L	**95**	**369**	**95**	----	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**1020**	**3850**	**1020**	----	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.001**	**0.002**	**0.001**	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.002**	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.003**	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	**0.005**	**0.005**	**0.006**	----	----
Manganese	7439-96-5	0.001	mg/L	**1.24**	**0.111**	**1.26**	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Iron	7439-89-6	0.05	mg/L	**1.57**	<0.05	**1.60**	----	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Arsenic	7440-38-2	0.001	mg/L	**0.001**	**0.001**	**0.001**	----	----
Cadmium	7440-43-9	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----
Chromium	7440-47-3	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Copper	7440-50-8	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	**0.001**	<0.001	----	----
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.003**	<0.001	----	----
Lead	7439-92-1	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Zinc	7440-66-6	0.005	mg/L	<0.005	<0.005	<0.005	----	----
Manganese	7439-96-5	0.001	mg/L	**1.39**	**0.113**	**1.39**	----	----
Selenium	7782-49-2	0.01	mg/L	<0.01	<0.01	<0.01	----	----
Tin	7440-31-5	0.001	mg/L	<0.001	<0.001	<0.001	----	----
Boron	7440-42-8	0.05	mg/L	<0.05	<0.05	<0.05	----	----
Iron	7439-89-6	0.05	mg/L	**1.82**	<0.05	**1.82**	----	----
EG035F: Dissolved Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	<0.0001	----	----

Analytical Results

Sub-Matrix: WATER (Matrix: WATER)				STP1	STP2	STP1 Duplicate	----	----
				21-Apr-2020 10:15	21-Apr-2020 11:20	21-Apr-2020 10:20	----	----
				EB2010933-001	EB2010933-002	EB2010933-003	--------	--------
				Result	Result	Result	----	----
EG035T: Total Recoverable Mercury by FIMS								
Mercury	7439-97-6	0.0001	mg/L	<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	----	----
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	**0.02**	<0.01	----	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.25**	**0.18**	**0.06**	----	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<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	<0.01	<0.01	----	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	<0.01	----	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.3**	**0.3**	**0.1**	----	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**0.3**	**0.3**	**0.1**	----	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.02**	**0.04**	**0.03**	----	----
EN67: Field Tests								
pH	----	0.01	pH Unit	**6.71**	**6.53**	**6.71**	----	----
Electrical Conductivity (Non Compensated)	----	0.1	µS/cm	**3730**	**11700**	**3730**	----	----
Dissolved Oxygen	----	0.01	mg/L	**0.72**	**1.13**	**0.72**	----	----
Temperature	----	0.1	°C	**24.1**	**24.0**	**24.1**	----	----
Redox Potential	----	0.1	mV	<0.1	**85.5**	<0.1	----	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	----	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	----	----

Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2010933**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: 4(6) Personal Infor	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 22-Apr-2020
Order number	: 4500059581	Date Analysis Commenced	: 22-Apr-2020
C-O-C number	: ----	Issue Date	: 28-Apr-2020
Sampler	: 4p4(6) Personal Informa		
Site	: ----		
Quote number	: BN/222/16		
No. of samples received	: 3		
No. of samples analysed	: 3		

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. 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

Signatories

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.

Signatories	*Position*	*Accreditation Category*
p4(6) Personal Inform	Senior Inorganic Chemist	Brisbane Inorganics, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Sampling, 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	*Client sample ID*	*Method : Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EB2010587-002	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	34	34	0.00	0% - 20%
EB2010590-010	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	<1	0.00	No Limit
EB2010587-002	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	454	452	0.284	0% - 20%
EB2010590-010	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	<1	<1	0.00	No Limit
EB2010930-006	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	0.002	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	0.257	0.264	2.43	0% - 20%
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.005	0.005	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	0.012	0.011	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	0.20	0.20	0.00	No Limit
EB2010430-002	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	<0.001	<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

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2010933**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: s6(6) Personal Infor	Telephone	: +61-7-3243 7222
Project	: Groundwater Monitoring	Date Samples Received	: 22-Apr-2020
Site	: ----	Issue Date	: 28-Apr-2020
Sampler	: s6(6) Personal Inform	No. of samples received	: 3
Order number	: 4500059581	No. of samples analysed	: 3

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							
ED045G: Chloride by Discrete Analyser	EB2010587--003	Anonymous	**Chloride**	16887-00-6	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, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**22-Apr-2020**	19-May-2020	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**22-Apr-2020**	19-May-2020	✓
EG020F: Dissolved Metals by ICP-MS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**23-Apr-2020**	18-Oct-2020	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**23-Apr-2020**	18-Oct-2020	✓	**23-Apr-2020**	18-Oct-2020	✓
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**23-Apr-2020**	19-May-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**23-Apr-2020**	19-May-2020	✓

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
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**23-Apr-2020**	18-Oct-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**23-Apr-2020**	18-Oct-2020	✓	**23-Apr-2020**	18-Oct-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**23-Apr-2020**	19-May-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**22-Apr-2020**	23-Apr-2020	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**23-Apr-2020**	19-May-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**24-Apr-2020**	19-May-2020	✓	**24-Apr-2020**	19-May-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**24-Apr-2020**	19-May-2020	✓	**24-Apr-2020**	19-May-2020	✓
EN67: Field Tests							
Clear Plastic Bottle - Natural (EN67)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**24-Apr-2020**	----	----
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**22-Apr-2020**	22-Apr-2020	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
STP1, STP2, STP1 Duplicate	**21-Apr-2020**	**----**	----	----	**22-Apr-2020**	22-Apr-2020	✓

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	17	**11.76**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	**33.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	2	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**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	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Total Silver in Fresh Water by ORC-ICPMS	EG094-AgT	1	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Low-Level Dissolved Silver in Fresh Water by ORC-ICPMS	EG094-AgF	1	3	**33.33**	**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	3	**33.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	17	**5.88**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	6	**16.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**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 (2013) 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 21st edition seal method 2 017-1-L april 2003
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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). 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 (2013) Schedule B(3)
Field Tests	EN67	WATER	Field determinations as per methods described in APHA. The analysis is performed in the field by ALS samplers. ALS NATA accreditation applies for this service.
Thermotolerant Coliforms & E.coli by Membrane Filtration	MW006	WATER	AS 4276.7 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007

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 (2013) 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 (2013) 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 (2013) Schedule B(3)

8/4

CHAIN OF CUSTODY

ALS Laboratory: please tick →

☐ADELAIDE 21 Burma Road Pooraka SA 5095 Ph: 08 8359 0890 E: adelaide@alsglobal.com
☐BRISBANE 2 Byth Street Stafford QLD 4053 Ph: 07 3243 7222 E: samples.brisbane@alsglobal.com
☐GLADSTONE 48 Callemondah Drive Clinton QLD 4680 Ph: 07 4978 7944 E: ALSEnviro.gladstone@alsglobal.com
☐MACKAY 78 Harbour Road Mackay QLD 4740 Ph: 07 4944 0177 E: mackay@alsglobal.com
☐MELBOURNE 2-4 Westall Road Springvale VIC 3171 Ph: 03 8549 9600 E: samples.melbourne@alsglobal.com
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☐NEWCASTLE 5 Rose Gum Road Warabrook NSW 2304 Ph: 02 4968 9433 E: samples.newcastle@alsglobal.com
☐NOWRA 4/13 Geary Place North Nowra NSW 2541 Ph: 02 4423 2063 E: nowra@alsglobal.com
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☐WOLLONGONG 99 Kenny Street Wollongong NSW 2500 Ph: 02 4225 3125 E: wollongong@alsglobal.com

CLIENT: TRILITY
OFFICE: AGNES WATER
PROJECT: GROUNDWATER MONITORING PROJECT NO.:
ORDER NUMBER: PURCHASE ORDER NO.: 4500059581
PROJECT MANAGER: (6) Personal Info CONTACT PH: DL: +61 7 49757975 | M: (6) Personal Inf
SAMPLER: D. McConnell SAMPLER MOBILE: Personal In
COC Emailed to ALS? (YES / NO) EDD FORMAT (or default):
Email Reports to: Personal I@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

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:

RELINQUISHED BY: 4p4(6) Personal Informat
DATE/TIME: [redacted] 21-4-20 1400

RECEIVED BY: (6) Personal Info
DATE/TIME: 28/09/2016 22/4/2020 8:10

RELINQUISHED BY:
DATE/TIME:

RECEIVED BY:
DATE/TIME:

COMMENTS/SPECIAL HANDLING/STORAGE OR DISPOSAL: Consignment Note: MYTF134526

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	DO Field	Temp field	EC Field µS/cm	ORP Field		Comments on likely contaminant levels, dilutions, or samples requiring specific QC analysis etc. Please add field results to COA
1	STP1	21/04/2020 1015	W		5	X	6.71	0.72	24.1	3729	-16.7		
2	STP2	21/04/2020 1120	W		5	X	6.53	1.13	24.0	1732	85.5		
	97-01		W										
	97-2		W										
	97-3		W										
	97-4		W										
	97-5		W										
	007		W										
	008		W										
3	STP1 Duplicate	21/04/2020 1020	W		5	X	6.71	0.72	24.1	3729	-16.7		
				TOTAL	15								

Environmental Division
Brisbane
Work Order Reference
EB2010933

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.

22-265 File B

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2016548**	Page	: 1 of 4
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	: ----	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 23-Jun-2020 10:50
Order number	: 4500061046	Date Analysis Commenced	: 23-Jun-2020
C-O-C number	: ----	Issue Date	: 29-Jun-2020 10:24
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. 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.

ch4p4(6) Personal Informatic	Microbiologist	Brisbane Microbiological, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Administration, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, 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.

- 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.
- ED041G (Sulfate 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.
- 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)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				22-Jun-2020 10:40	22-Jun-2020 12:10	22-Jun-2020 13:00	22-Jun-2020 10:45	----
				EB2016548-001	EB2016548-002	EB2016548-003	EB2016548-004	--------
				Result	Result	Result	Result	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<5	<5	<5	<5	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**77**	**52**	**47**	**78**	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.61**	**0.59**	**0.78**	**0.60**	----
Arsenic	7440-38-2	0.001	mg/L	<0.001	<0.001	**0.002**	<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	**0.003**	<0.001	----
Copper	7440-50-8	0.001	mg/L	**0.002**	**0.002**	<0.001	**0.001**	----
Cobalt	7440-48-4	0.001	mg/L	<0.001	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	**0.001**	**0.002**	<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	**0.007**	**0.009**	**0.005**	**0.005**	----
Manganese	7439-96-5	0.001	mg/L	**0.014**	**0.014**	**0.026**	**0.013**	----
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	**0.17**	**0.74**	**3.46**	**0.17**	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	**0.62**	**0.63**	**0.84**	**0.61**	----
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	**0.003**	<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	<0.001	<0.001	<0.001	----
Nickel	7440-02-0	0.001	mg/L	<0.001	<0.001	**0.002**	<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	**0.013**	**0.012**	**0.023**	**0.013**	----
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	**0.17**	**0.76**	**3.36**	**0.16**	----
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)				DESAL 1	DESAL 2	DESAL 3	DESAL 1 Duplicate	----
				22-Jun-2020 10:40	22-Jun-2020 12:10	22-Jun-2020 13:00	22-Jun-2020 10:45	----
				EB2016548-001	EB2016548-002	EB2016548-003	EB2016548-004	--------
				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	**0.12**	**0.15**	**0.47**	**0.13**	----
EK057G: Nitrite as N by Discrete Analyser								
Nitrite as N	14797-65-0	0.01	mg/L	<0.05	<0.05	<0.05	<0.05	----
EK058G: Nitrate as N by Discrete Analyser								
Nitrate as N	14797-55-8	0.01	mg/L	**0.30**	<0.05	<0.05	**0.31**	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	**0.30**	<0.01	<0.01	**0.31**	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**1.1**	**1.0**	**1.2**	**1.1**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**1.4**	**1.0**	**1.2**	**1.4**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.01**	**0.14**	**0.07**	**0.01**	----
EN67: Field Tests								
ø **Electrical Conductivity (Non Compensated)**	----	1	µS/cm	**343.1**	**238.2**	**202.0**	**343.1**	----
ø **Dissolved Oxygen**	----	0.1	mg/L	**0.18**	**0.32**	**0.34**	**0.18**	----
ø **pH**	----	0.01	pH Unit	**4.10**	**4.30**	**5.07**	**4.10**	----
ø **Temperature**	----	0.1	°C	**24.5**	**23.8**	**26.3**	**24.5**	----
ø **Reactive Phosphorus as P**	14265-44-2	0.01	mg/L	**149.6**	**30.0**	**-117.0**	**149.6**	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	<1	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	<1	<1	----

QUALITY CONTROL REPORT

Work Order	: **EB2016548**	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	: ----	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 23-Jun-2020
Order number	: 4500061046	Date Analysis Commenced	: 23-Jun-2020
C-O-C number	: ----	Issue Date	: 29-Jun-2020
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. 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.

4p4(6) Personal Informat	Microbiologist	Brisbane Microbiological, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Administration, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, 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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3097754)									
EB2016492-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	40	40	0.00	0% - 20%
EB2016510-008	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	2	2	0.00	No Limit
ED045G: Chloride by Discrete Analyser (QC Lot: 3097755)									
EB2016492-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	550	552	0.459	0% - 20%
EB2016510-008	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	10	10	0.00	0% - 50%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3097528)									
EB2016555-002	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	<0.001	<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
		EG020A-F: Manganese	7439-96-5	0.001	mg/L	0.014	0.014	0.00	0% - 50%
		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	<0.01	127	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
EB2016512-017	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

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3097528) - continued									
EB2016512-017	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	0.108	0.108	0.00	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	<0.01	<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: 3097518)									
EB2016512-013	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	<0.001	<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	0.002	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	0.015	0.016	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	<0.001	<0.001	0.00	No Limit
		EG020A-T: Zinc	7440-66-6	0.005	mg/L	0.018	0.020	9.22	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.60	0.56	7.69	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	0.69	0.66	4.67	0% - 50%
		EG020A-T: Iron	7439-89-6	0.05	mg/L	1.92	2.00	4.34	0% - 20%
EB2016565-001	Anonymous	EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.1 µg/L	0.0001	0.00	No Limit
		EG020A-T: Arsenic	7440-38-2	0.001	mg/L	7 µg/L	0.007	0.00	No Limit
		EG020A-T: Chromium	7440-47-3	0.001	mg/L	49 µg/L	0.050	2.48	0% - 20%
		EG020A-T: Cobalt	7440-48-4	0.001	mg/L	44 µg/L	0.044	0.00	0% - 20%
		EG020A-T: Copper	7440-50-8	0.001	mg/L	67 µg/L	0.068	1.74	0% - 20%
		EG020A-T: Lead	7439-92-1	0.001	mg/L	40 µg/L	0.041	0.00	0% - 20%
		EG020A-T: Manganese	7439-96-5	0.001	mg/L	772 µg/L	0.753	2.48	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	51 µg/L	0.051	0.00	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	137 µg/L	0.132	3.61	0% - 20%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	40400 µg/L	42.3	4.76	0% - 20%
		EG020A-T: Selenium	7782-49-2	0.01	mg/L	<10 µg/L	<0.01	0.00	No Limit
		EG020A-T: Boron	7440-42-8	0.05	mg/L	50 µg/L	0.05	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	38800 µg/L	39.1	0.983	0% - 20%
EG035F: Dissolved Mercury by FIMS (QC Lot: 3097527)									
EB2016512-017	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3097531)									

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3097531) - continued									
EB2016512-013	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2016548-004	DESAL 1 Duplicate	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: 3097537)									
EB2016548-001	DESAL 1	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: 3097539)									
EB2016548-001	DESAL 1	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: 3102325)									
EB2016623-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB2016534-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.08	0.08	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3097753)									
EB2016492-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB2016510-008	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: 3102324)									
EB2016623-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.16	0.16	0.00	0% - 50%
EB2016534-001	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: 3101497)									
EB2016444-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	0.5	0.5	0.00	No Limit
EB2016548-001	DESAL 1	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	1.1	1.3	16.6	0% - 50%
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3101498)									
EB2016444-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.04	0.04	0.00	No Limit
EB2016548-001	DESAL 1	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.01	0.03	86.1	No Limit

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3097754)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	101	85.0	118
				<1	100 mg/L	106	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 3097755)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.6	90.0	115
				<1	1000 mg/L	102	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 3097528)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	101	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	111	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	104	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	105	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	112	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	110	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	100	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	105	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	108	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	103	86.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	108	87.0	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	104	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 3097518)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	99.5	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	96.7	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	100	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	103	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	98.0	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.8	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	99.4	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	101	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	98.9	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	107	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	101	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	103	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	Recovery Limits (%): Low	Recovery Limits (%): High
EG035F: Dissolved Mercury by FIMS (QCLot: 3097527)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	99.3	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3097531)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	93.6	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3097537)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	95.0	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3097539)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	98.2	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3102325)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	103	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3097753)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.0	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3102324)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	89.9	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3101497)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	10 mg/L	94.0	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3101498)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	4.42 mg/L	97.4	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	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3097754)							
EB2016509-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 3097755)							
EB2016509-001	Anonymous	ED045G: Chloride	16887-00-6	400 mg/L	99.0	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 3097528)							
EB2016512-018	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	110	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	100	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	106	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	99.5	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	96.6	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3097528) - continued							
EB2016512-018	Anonymous	EG020A-F: Manganese	7439-96-5	1 mg/L	98.3	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	103	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	106	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 3097518)							
EB2016512-014	Anonymous	EG020A-T: Arsenic	7440-38-2	1 mg/L	104	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	106	70.0	130
		EG020A-T: Cobalt	7440-48-4	1 mg/L	111	70.0	130
		EG020A-T: Copper	7440-50-8	1 mg/L	106	70.0	130
		EG020A-T: Lead	7439-92-1	1 mg/L	105	70.0	130
		EG020A-T: Manganese	7439-96-5	1 mg/L	106	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	102	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3097527)							
EB2016512-018	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	85.1	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3097531)							
EB2016512-014	Anonymous	EG035T: Mercury	7439-97-6	0.01 mg/L	86.3	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3102325)							
EB2016548-001	DESAL 1	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	90.1	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3097753)							
EB2016509-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	104	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3102324)							
EB2016548-001	DESAL 1	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	79.7	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3101497)							
EB2016444-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	92.3	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3101498)							
EB2016444-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	102	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2016548**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: 4(6) Personal Infor	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 23-Jun-2020
Site	: ----	Issue Date	: 29-Jun-2020
Sampler	: 4p4(6) Personal Informa	No. of samples received	: 4
Order number	: 4500061046	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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2016509--001	Anonymous	**Sulfate as SO4 - Turbidimetric**	14808-79-8	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)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**24-Jun-2020**	20-Jul-2020	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**24-Jun-2020**	20-Jul-2020	✓
EG020F: Dissolved Metals by ICP-MS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**25-Jun-2020**	19-Dec-2020	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**24-Jun-2020**	19-Dec-2020	✓	**24-Jun-2020**	19-Dec-2020	✓
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**25-Jun-2020**	20-Jul-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**24-Jun-2020**	20-Jul-2020	✓

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
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG094-AgF)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**24-Jun-2020**	19-Dec-2020	✓
EG094T: Total metals in Fresh water by ORC-ICPMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG094-AgT)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**24-Jun-2020**	19-Dec-2020	✓	**24-Jun-2020**	19-Dec-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**26-Jun-2020**	20-Jul-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**24-Jun-2020**	24-Jun-2020	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**26-Jun-2020**	20-Jul-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**26-Jun-2020**	20-Jul-2020	✓	**26-Jun-2020**	20-Jul-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**26-Jun-2020**	20-Jul-2020	✓	**26-Jun-2020**	20-Jul-2020	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**23-Jun-2020**	23-Jun-2020	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
DESAL 1, DESAL 2, DESAL 3, DESAL 1 Duplicate	**22-Jun-2020**	**----**	----	----	**23-Jun-2020**	23-Jun-2020	✓

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	16	**12.50**	**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	1	9	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	2	11	**18.18**	**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	19	**10.53**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	2	18	**11.11**	**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	12	**16.67**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**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	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	11	**9.09**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.56**	**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	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**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	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	11	**9.09**	**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	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.56**	**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	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	16	**6.25**	**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	9	**11.11**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Metals by ICP-MS - Suite A	EG020A-F	1	11	**9.09**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite and Nitrate as N (NOx) by Discrete Analyser	EK059G	1	19	**5.26**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Nitrite as N by Discrete Analyser	EK057G	1	18	**5.56**	**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	12	**8.33**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Metals by ICP-MS - Suite A	EG020A-T	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**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 (2013) 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 21st edition seal method 2 017-1-L april 2003
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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). 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 (2013) 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 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007

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 (2013) 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 (2013) 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 (2013) Schedule B(3)

CHAIN OF CUSTODY

ALS Laboratory: please tick →

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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):	FOR LABORATORY USE ONLY (Circle)
OFFICE: AGNES WATER			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.: 4500061046	COUNTRY OF ORIGIN:	COC: 1 2 3 4 5 6 7	Random Sample Temperature on Receipt: °C
PROJECT MANAGER:) Personal Inf	CONTACT PH: DL: +61 7 49757975 | M:) Personal Inf	OF: 1 2 3 4 5 6 7	Other comment:
SAMPLER: 6) Personal Info	SAMPLER MOBILE:) Personal Inf		
COC Emailed to ALS? (YES / NO)	EDD FORMAT (or default):		
Email Reports to: Personal I@trility.com.au; awatergroup@trility.com.au			
Email Invoice to (will default to PM if no other addresses are listed): accountspayable@trility.com.au			

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
ch4p4(6) Personal Informatio	(6) Personal Info		
DATE/TIME: 22/06/2020 1400	DATE/TIME: 23/6/2020 10:50	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	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	22/06/2020 1040	W		5	X	24.5	0.18	343.1	4.10	149.6				
2	DESAL 2	22/06/2020 1210	W		5	X	23.8	0.32	238.2	4.30	30.0				
3	DESAL 3	22/06/2020 1300	W		5	X	26.3	0.34	202.0	5.07	-117.0				
4	DESAL 1 Duplicate	22/06/2020 1045	W		5	X	24.5	0.18	343.1	4.10	149.6				
				TOTAL	20										

Environmental Division
Brisbane
Work Order Reference
EB2016548

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.

ALS Environmental

CERTIFICATE OF ANALYSIS

Work Order	: **EB2016812**	Page	: 1 of 4
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: (6) Personal Infor	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 25-Jun-2020 08:40
Order number	: 4500061046	Date Analysis Commenced	: 25-Jun-2020
C-O-C number	: ----	Issue Date	: 02-Jul-2020 14:27
Sampler	: 4(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. 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 Administration, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, 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.

- EK061G (Total Kjeldahl Nitrogen as N): Sample EB2016812_002 (STP2) was 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 EG020T (Total Metals) is less than EG020F (Dissolved Metals) 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 (Matrix: WATER)				STP1	STP2	97-01	STP1 Duplicate	----
				24-Jun-2020 11:15	24-Jun-2020 09:20	24-Jun-2020 10:10	24-Jun-2020 11:20	----
				EB2016812-001	EB2016812-002	EB2016812-003	EB2016812-004	--------
				Result	Result	Result	Result	----
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA								
Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	**92**	**369**	**16**	**92**	----
ED045G: Chloride by Discrete Analyser								
Chloride	16887-00-6	1	mg/L	**1020**	**3850**	**231**	**1020**	----
EG020F: Dissolved Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	**0.08**	<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	**0.004**	**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	**0.006**	<0.005	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	**1.38**	**0.116**	**0.006**	**1.38**	----
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	**1.78**	**0.05**	<0.05	**1.76**	----
EG020T: Total Metals by ICP-MS								
Aluminium	7429-90-5	0.01	mg/L	<0.01	<0.01	**0.16**	<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	**0.002**	<0.001	<0.001	<0.001	----
Copper	7440-50-8	0.001	mg/L	<0.001	**0.002**	<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	**0.012**	**0.003**	<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	**0.017**	<0.005	<0.005	----
Manganese	7439-96-5	0.001	mg/L	**1.26**	**0.121**	**0.012**	**1.28**	----
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	**0.18**	<0.05	----
Iron	7439-89-6	0.05	mg/L	**1.66**	**0.06**	**0.08**	**1.63**	----
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	----
				24-Jun-2020 11:15	24-Jun-2020 09:20	24-Jun-2020 10:10	24-Jun-2020 11:20	----
				EB2016812-001	EB2016812-002	EB2016812-003	EB2016812-004	--------
				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	**0.02**	<0.01	<0.01	----
EG094T: Total metals in Fresh water by ORC-ICPMS								
Silver	7440-22-4	0.01	µg/L	<0.01	**0.02**	<0.01	<0.01	----
EK055G: Ammonia as N by Discrete Analyser								
Ammonia as N	7664-41-7	0.01	mg/L	**0.03**	**0.03**	**0.04**	**0.04**	----
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	<0.01	**0.15**	<0.01	----
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser								
Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	<0.01	**0.15**	<0.01	----
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser								
Total Kjeldahl Nitrogen as N	----	0.1	mg/L	**0.1**	<0.5	**0.3**	**0.1**	----
EK062G: Total Nitrogen as N (TKN + NOx) by Discrete Analyser								
^ **Total Nitrogen as N**	----	0.1	mg/L	**0.1**	<0.5	**0.4**	**0.1**	----
EK067G: Total Phosphorus as P by Discrete Analyser								
Total Phosphorus as P	----	0.01	mg/L	**0.01**	**0.07**	**0.02**	**0.01**	----
EN67: Field Tests								
ø **Electrical Conductivity (Non Compensated)**	----	1	µS/cm	**3844**	**12069**	**781**	**3844**	----
ø **Dissolved Oxygen**	----	0.1	mg/L	**0.85**	**0.49**	**2.46**	**0.85**	----
ø **pH**	----	0.01	pH Unit	**6.67**	**6.50**	**5.56**	**6.67**	----
ø **Temperature**	----	0.1	°C	**23.7**	**23.8**	**19.5**	**23.7**	----
ø **Reactive Phosphorus as P**	14265-44-2	0.01	mg/L	**1.0**	**80.0**	**148.1**	**1.0**	----
MW006: Faecal Coliforms & E.coli by MF								
Faecal Coliforms	----	1	CFU/100mL	<1	<1	**~65**	<1	----
MW023: Enterococci by Membrane Filtration								
Enterococci	----	1	CFU/100mL	<1	<1	**21**	<1	----

ALS Environmental

QUALITY CONTROL REPORT

Work Order	: **EB2016812**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: (6) Personal Infor	Contact	: Customer Services EB
Address	: LOT 40 SPRINGS ROAD AGNES WATER QLD 4677	Address	: 2 Byth Street Stafford QLD Australia 4053
Telephone	: ----	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 25-Jun-2020
Order number	: 4500061046	Date Analysis Commenced	: 25-Jun-2020
C-O-C number	: ----	Issue Date	: 02-Jul-2020
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. 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 Inf	Senior Inorganic Chemist	Brisbane Administration, Stafford, QLD
	Senior Inorganic Chemist	Brisbane Inorganics, 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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QC Lot: 3102812)									
EB2016756-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	57	56	0.00	0% - 20%
EB2016813-001	Anonymous	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	78	78	0.00	0% - 20%
ED045G: Chloride by Discrete Analyser (QC Lot: 3102813)									
EB2016756-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	142	141	0.770	0% - 20%
EB2016813-001	Anonymous	ED045G: Chloride	16887-00-6	1	mg/L	1400	1390	0.250	0% - 20%
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3102731)									
EB2016807-005	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	0.003	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	<0.001	<0.001	0.00	No Limit
		EG020A-F: Nickel	7440-02-0	0.001	mg/L	0.002	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
EB2016805-004	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	0.036	0.036	0.00	0% - 20%
		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	0.002	0.002	0.00	No Limit

Sub-Matrix: **WATER**

				Laboratory Duplicate (DUP) Report					
Laboratory sample ID	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG020F: Dissolved Metals by ICP-MS (QC Lot: 3102731) - continued									
EB2016805-004	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	0.004	0.004	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	0.006	0.006	0.00	No Limit
		EG020A-F: Aluminium	7429-90-5	0.01	mg/L	0.81	0.88	9.02	0% - 20%
		EG020A-F: Selenium	7782-49-2	0.01	mg/L	0.04	0.04	0.00	No Limit
		EG020A-F: Iron	7439-89-6	0.05	mg/L	0.08	0.09	0.00	No Limit
EG020T: Total Metals by ICP-MS (QC Lot: 3102676)									
EB2016736-001	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	<0.001	<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	0.048	0.048	0.00	0% - 20%
		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	0.013	0.013	0.00	0% - 50%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.013	0.013	0.00	0% - 50%
		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	0.075	0.077	2.22	0% - 50%
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.10	0.10	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	0.09	0.09	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.20	0.19	0.00	No Limit
EB2016807-003	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	0.002	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	0.006	0.006	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	0.132	0.134	1.35	0% - 20%
		EG020A-T: Nickel	7440-02-0	0.001	mg/L	0.003	0.003	0.00	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	<0.005	<0.005	0.00	No Limit
		EG020A-T: Aluminium	7429-90-5	0.01	mg/L	0.43	0.37	14.2	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	0.05	0.05	0.00	No Limit
		EG020A-T: Iron	7439-89-6	0.05	mg/L	0.56	0.54	3.82	0% - 50%
EG035F: Dissolved Mercury by FIMS (QC Lot: 3102729)									
EB2016793-030	Anonymous	EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2016807-005	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	*Client sample ID*	*Method: Compound*	*CAS Number*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD (%)*	*Recovery Limits (%)*
EG035T: Total Recoverable Mercury by FIMS (QC Lot: 3102674)									
EB2016736-001	Anonymous	EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	<0.0001	0.00	No Limit
EB2016807-004	Anonymous	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: 3102645)									
EB2016812-001	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: 3102651)									
EB2016812-001	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: 3109117)									
EB2016703-001	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	<0.01	0.00	No Limit
EB2016807-003	Anonymous	EK055G: Ammonia as N	7664-41-7	0.01	mg/L	0.05	0.05	0.00	No Limit
EK057G: Nitrite as N by Discrete Analyser (QC Lot: 3102814)									
EB2016756-001	Anonymous	EK057G: Nitrite as N	14797-65-0	0.01	mg/L	0.04	0.04	0.00	No Limit
EB2016813-001	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: 3109116)									
EB2016703-001	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	0.02	0.02	0.00	No Limit
EB2016807-003	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: 3108936)									
EB2016796-001	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	41.5	43.1	3.83	0% - 20%
EB2016812-002	STP2	EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.5	<0.5	0.00	No Limit
EK067G: Total Phosphorus as P by Discrete Analyser (QC Lot: 3108935)									
EB2016796-001	Anonymous	EK067G: Total Phosphorus as P	----	0.01	mg/L	6.07	6.20	2.03	0% - 20%
EB2016812-002	STP2	EK067G: Total Phosphorus as P	----	0.01	mg/L	0.07	<0.05	31.9	No Limit

Method Blank (MB) and Laboratory Control Spike (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 Spike (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 (%)	Recovery Limits (%)	
Method: Compound	CAS Number	LOR	Unit	Result	Concentration	LCS	Low	High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3102812)								
ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	1	mg/L	<1	25 mg/L	99.8	85.0	118
				<1	100 mg/L	95.7	85.0	118
ED045G: Chloride by Discrete Analyser (QCLot: 3102813)								
ED045G: Chloride	16887-00-6	1	mg/L	<1	10 mg/L	96.8	90.0	115
				<1	1000 mg/L	103	90.0	115
EG020F: Dissolved Metals by ICP-MS (QCLot: 3102731)								
EG020A-F: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	96.1	79.0	118
EG020A-F: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	103	88.0	116
EG020A-F: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	103	88.0	108
EG020A-F: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	95.4	87.0	113
EG020A-F: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	99.5	86.0	112
EG020A-F: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	97.6	88.0	114
EG020A-F: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	101	89.0	110
EG020A-F: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	94.2	89.0	120
EG020A-F: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	98.1	89.0	113
EG020A-F: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	103	83.0	112
EG020A-F: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	103	86.0	112
EG020A-F: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	97.7	87.0	113
EG020A-F: Iron	7439-89-6	0.05	mg/L	<0.05	0.5 mg/L	97.5	82.0	114
EG020T: Total Metals by ICP-MS (QCLot: 3102676)								
EG020A-T: Aluminium	7429-90-5	0.01	mg/L	<0.01	0.5 mg/L	99.0	80.0	114
EG020A-T: Arsenic	7440-38-2	0.001	mg/L	<0.001	0.1 mg/L	105	88.0	112
EG020A-T: Cadmium	7440-43-9	0.0001	mg/L	<0.0001	0.1 mg/L	104	88.0	111
EG020A-T: Chromium	7440-47-3	0.001	mg/L	<0.001	0.1 mg/L	102	89.0	115
EG020A-T: Cobalt	7440-48-4	0.001	mg/L	<0.001	0.1 mg/L	107	89.0	115
EG020A-T: Copper	7440-50-8	0.001	mg/L	<0.001	0.1 mg/L	107	88.0	116
EG020A-T: Lead	7439-92-1	0.001	mg/L	<0.001	0.1 mg/L	99.5	89.0	112
EG020A-T: Manganese	7439-96-5	0.001	mg/L	<0.001	0.1 mg/L	102	88.0	114
EG020A-T: Nickel	7440-02-0	0.001	mg/L	<0.001	0.1 mg/L	104	88.0	116
EG020A-T: Selenium	7782-49-2	0.01	mg/L	<0.01	0.1 mg/L	99.0	79.0	111
EG020A-T: Tin	7440-31-5	0.001	mg/L	<0.001	0.1 mg/L	104	86.0	116
EG020A-T: Zinc	7440-66-6	0.005	mg/L	<0.005	0.1 mg/L	99.0	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	Recovery Limits (%): Low	Recovery Limits (%): High
EG035F: Dissolved Mercury by FIMS (QCLot: 3102729)								
EG035F: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	105	84.0	118
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3102674)								
EG035T: Mercury	7439-97-6	0.0001	mg/L	<0.0001	0.01 mg/L	110	84.0	118
EG094F: Dissolved Metals in Fresh Water by ORC-ICPMS (QCLot: 3102645)								
EG094-AgF: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	98.5	70.0	130
EG094T: Total metals in Fresh water by ORC-ICPMS (QCLot: 3102651)								
EG094-AgT: Silver	7440-22-4	0.01	µg/L	<0.01	0.2 µg/L	104	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3109117)								
EK055G: Ammonia as N	7664-41-7	0.01	mg/L	<0.01	0.5 mg/L	102	83.5	114
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3102814)								
EK057G: Nitrite as N	14797-65-0	0.01	mg/L	<0.01	0.5 mg/L	99.0	90.0	110
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3109116)								
EK059G: Nitrite + Nitrate as N	----	0.01	mg/L	<0.01	0.5 mg/L	98.9	85.7	111
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3108936)								
EK061G: Total Kjeldahl Nitrogen as N	----	0.1	mg/L	<0.1	1 mg/L	86.5	70.1	108
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3108935)								
EK067G: Total Phosphorus as P	----	0.01	mg/L	<0.01	0.442 mg/L	91.7	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	Client sample ID	Method: Compound	CAS Number	Matrix Spike (MS) Report: Spike Concentration	SpikeRecovery(%): MS	Recovery Limits (%): Low	Recovery Limits (%): High
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA (QCLot: 3102812)							
EB2016812-001	STP1	ED041G: Sulfate as SO4 - Turbidimetric	14808-79-8	20 mg/L	# Not Determined	70.0	130
ED045G: Chloride by Discrete Analyser (QCLot: 3102813)							
EB2016812-001	STP1	ED045G: Chloride	16887-00-6	400 mg/L	77.5	70.0	130
EG020F: Dissolved Metals by ICP-MS (QCLot: 3102731)							
EB2016805-003	Anonymous	EG020A-F: Arsenic	7440-38-2	1 mg/L	98.2	70.0	130
		EG020A-F: Cadmium	7440-43-9	0.25 mg/L	102	70.0	130
		EG020A-F: Chromium	7440-47-3	1 mg/L	98.6	70.0	130
		EG020A-F: Cobalt	7440-48-4	1 mg/L	103	70.0	130
		EG020A-F: Copper	7440-50-8	1 mg/L	98.0	70.0	130
		EG020A-F: Lead	7439-92-1	1 mg/L	108	70.0	130

Sub-Matrix: **WATER**

				Matrix Spike (MS) Report			
				Spike	SpikeRecovery(%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Method: Compound	CAS Number	Concentration	MS	Low	High
EG020F: Dissolved Metals by ICP-MS (QCLot: 3102731) - continued							
EB2016805-003	Anonymous	EG020A-F: Manganese	7439-96-5	1 mg/L	99.6	70.0	130
		EG020A-F: Nickel	7440-02-0	1 mg/L	94.9	70.0	130
		EG020A-F: Zinc	7440-66-6	1 mg/L	95.2	70.0	130
EG020T: Total Metals by ICP-MS (QCLot: 3102676)							
EB2016736-002	Anonymous	EG020A-T: Arsenic	7440-38-2	5 mg/L	104	70.0	130
		EG020A-T: Cadmium	7440-43-9	1.25 mg/L	102	70.0	130
		EG020A-T: Chromium	7440-47-3	5 mg/L	85.7	70.0	130
		EG020A-T: Cobalt	7440-48-4	5 mg/L	100	70.0	130
		EG020A-T: Copper	7440-50-8	5 mg/L	98.8	70.0	130
		EG020A-T: Lead	7439-92-1	5 mg/L	94.2	70.0	130
		EG020A-T: Manganese	7439-96-5	5 mg/L	79.4	70.0	130
		EG020A-T: Nickel	7440-02-0	5 mg/L	101	70.0	130
		EG020A-T: Zinc	7440-66-6	5 mg/L	97.9	70.0	130
EG035F: Dissolved Mercury by FIMS (QCLot: 3102729)							
EB2016807-002	Anonymous	EG035F: Mercury	7439-97-6	0.01 mg/L	95.2	70.0	130
EG035T: Total Recoverable Mercury by FIMS (QCLot: 3102674)							
EB2016736-002	Anonymous	EG035T: Mercury	7439-97-6	0.05 mg/L	73.4	70.0	130
EK055G: Ammonia as N by Discrete Analyser (QCLot: 3109117)							
EB2016703-002	Anonymous	EK055G: Ammonia as N	7664-41-7	0.4 mg/L	98.4	70.0	130
EK057G: Nitrite as N by Discrete Analyser (QCLot: 3102814)							
EB2016812-001	STP1	EK057G: Nitrite as N	14797-65-0	0.4 mg/L	99.0	70.0	130
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser (QCLot: 3109116)							
EB2016703-002	Anonymous	EK059G: Nitrite + Nitrate as N	----	0.4 mg/L	94.0	70.0	130
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser (QCLot: 3108936)							
EB2016796-002	Anonymous	EK061G: Total Kjeldahl Nitrogen as N	----	5 mg/L	100	70.0	130
EK067G: Total Phosphorus as P by Discrete Analyser (QCLot: 3108935)							
EB2016796-002	Anonymous	EK067G: Total Phosphorus as P	----	1 mg/L	106	70.0	130

ALS Environmental

QA/QC Compliance Assessment to assist with Quality Review

Work Order	: **EB2016812**	Page	: 1 of 7
Client	: **TRILITY Pty Ltd**	Laboratory	: Environmental Division Brisbane
Contact	: 4(6) Personal Infor	Telephone	: +61-7-3243 7222
Project	: GROUNDWATER MONITORING	Date Samples Received	: 25-Jun-2020
Site	: ----	Issue Date	: 02-Jul-2020
Sampler	: 4(6) Personal Infor	No. of samples received	: 4
Order number	: 4500061046	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							
ED041G: Sulfate (Turbidimetric) as SO4 2- by DA	EB2016812--001	STP1	**Sulfate as SO4 - Turbidimetric**	14808-79-8	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	**24-Jun-2020**	**----**	----	----	**26-Jun-2020**	22-Jul-2020	✓
ED045G: Chloride by Discrete Analyser							
Clear Plastic Bottle - Natural (ED045G)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**----**	----	----	**26-Jun-2020**	22-Jul-2020	✓
EG020F: Dissolved Metals by ICP-MS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG020A-F)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**----**	----	----	**29-Jun-2020**	21-Dec-2020	✓
EG020T: Total Metals by ICP-MS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG020A-T)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**27-Jun-2020**	21-Dec-2020	✓	**27-Jun-2020**	21-Dec-2020	✓
EG035F: Dissolved Mercury by FIMS							
Clear HDPE (U-T ORC) - Filtered; Lab-acidified (EG035F)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**----**	----	----	**30-Jun-2020**	22-Jul-2020	✓
EG035T: Total Recoverable Mercury by FIMS							
Clear HDPE (U-T ORC) - Unfiltered; Lab-acidified (EG035T)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**----**	----	----	**29-Jun-2020**	22-Jul-2020	✓

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
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	**24-Jun-2020**	**----**	----	----	**29-Jun-2020**	21-Dec-2020	✓
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	**24-Jun-2020**	**27-Jun-2020**	21-Dec-2020	✓	**27-Jun-2020**	21-Dec-2020	✓
EK055G: Ammonia as N by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK055G)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**----**	----	----	**30-Jun-2020**	22-Jul-2020	✓
EK057G: Nitrite as N by Discrete Analyser							
Clear Plastic Bottle - Natural (EK057G)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**----**	----	----	**26-Jun-2020**	26-Jun-2020	✓
EK059G: Nitrite plus Nitrate as N (NOx) by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK059G)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**----**	----	----	**30-Jun-2020**	22-Jul-2020	✓
EK061G: Total Kjeldahl Nitrogen By Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK061G)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**30-Jun-2020**	22-Jul-2020	✓	**30-Jun-2020**	22-Jul-2020	✓
EK067G: Total Phosphorus as P by Discrete Analyser							
Clear Plastic Bottle - Sulfuric Acid (EK067G)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**30-Jun-2020**	22-Jul-2020	✓	**30-Jun-2020**	22-Jul-2020	✓
MW006: Faecal Coliforms & E.coli by MF							
Sterile Plastic Bottle - Sodium Thiosulfate (MW006)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**----**	----	----	**25-Jun-2020**	25-Jun-2020	✓
MW023: Enterococci by Membrane Filtration							
Sterile Plastic Bottle - Sodium Thiosulfate (MW023)							
STP1, STP2, 97-01, STP1 Duplicate	**24-Jun-2020**	**----**	----	----	**25-Jun-2020**	25-Jun-2020	✓

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	18	**11.11**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	2	12	**16.67**	**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	2	16	**12.50**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**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	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	2	20	**10.00**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Laboratory Control Samples (LCS)							
Ammonia as N by Discrete analyser	EK055G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	2	15	**13.33**	**10.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	12	**8.33**	**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	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	2	19	**10.53**	**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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Method Blanks (MB)							
Ammonia as N by Discrete analyser	EK055G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	12	**8.33**	**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	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Matrix Spikes (MS)							
Ammonia as N by Discrete analyser	EK055G	1	18	**5.56**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Chloride by Discrete Analyser	ED045G	1	15	**6.67**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Dissolved Mercury by FIMS	EG035F	1	12	**8.33**	**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	1	16	**6.25**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Sulfate (Turbidimetric) as SO4 2- by Discrete Analyser	ED041G	1	19	**5.26**	**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	20	**5.00**	**5.00**	✓	NEPM 2013 B3 & ALS QC Standard
Total Phosphorus as P By Discrete Analyser	EK067G	1	20	**5.00**	**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 (2013) 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 21st edition seal method 2 017-1-L april 2003
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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) 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 (2013) Schedule B(3)
Total Phosphorus as P By Discrete Analyser	EK067G	WATER	In house: Referenced to APHA 4500-P H, Jirka et al (1976), Zhang et al (2006). 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 (2013) 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 2007
Enumeration of Enterococci by Membrane Filtration	MW023	WATER	AS4276.9: - 2007

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 (2013) 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 (2013) 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 (2013) Schedule B(3)

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Appendix D: Groundwater Contours

Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, July 2019	
Figure D-1	**Trility Pty Ltd**
Date: *15/10/2019*	**Author:** Personal **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 Inferred Groundwater Flow Direction, August 2019

Figure D-2	**Trility Pty Ltd**
Date: *15/10/2019*	**Author:** Personal
Revision: R1	**Map Scale:** 1:800
	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

Lot Boundary

Groundwater Bore

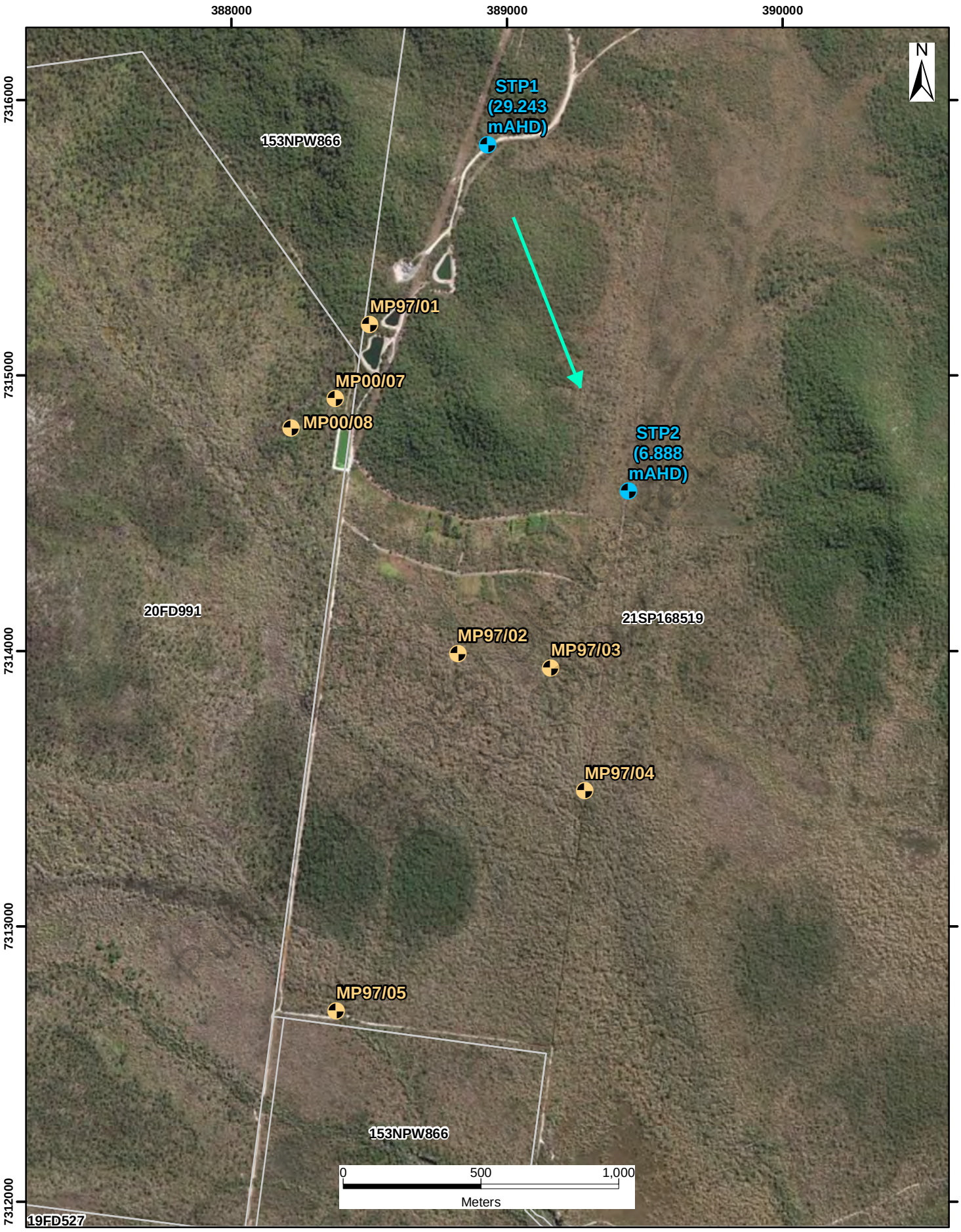
Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, September 2019	
Figure D-3	**Trility Pty Ltd**
Date: *15/10/2019*	**Author:** personal
Revision: R1	**Map Scale:** 1:800
	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

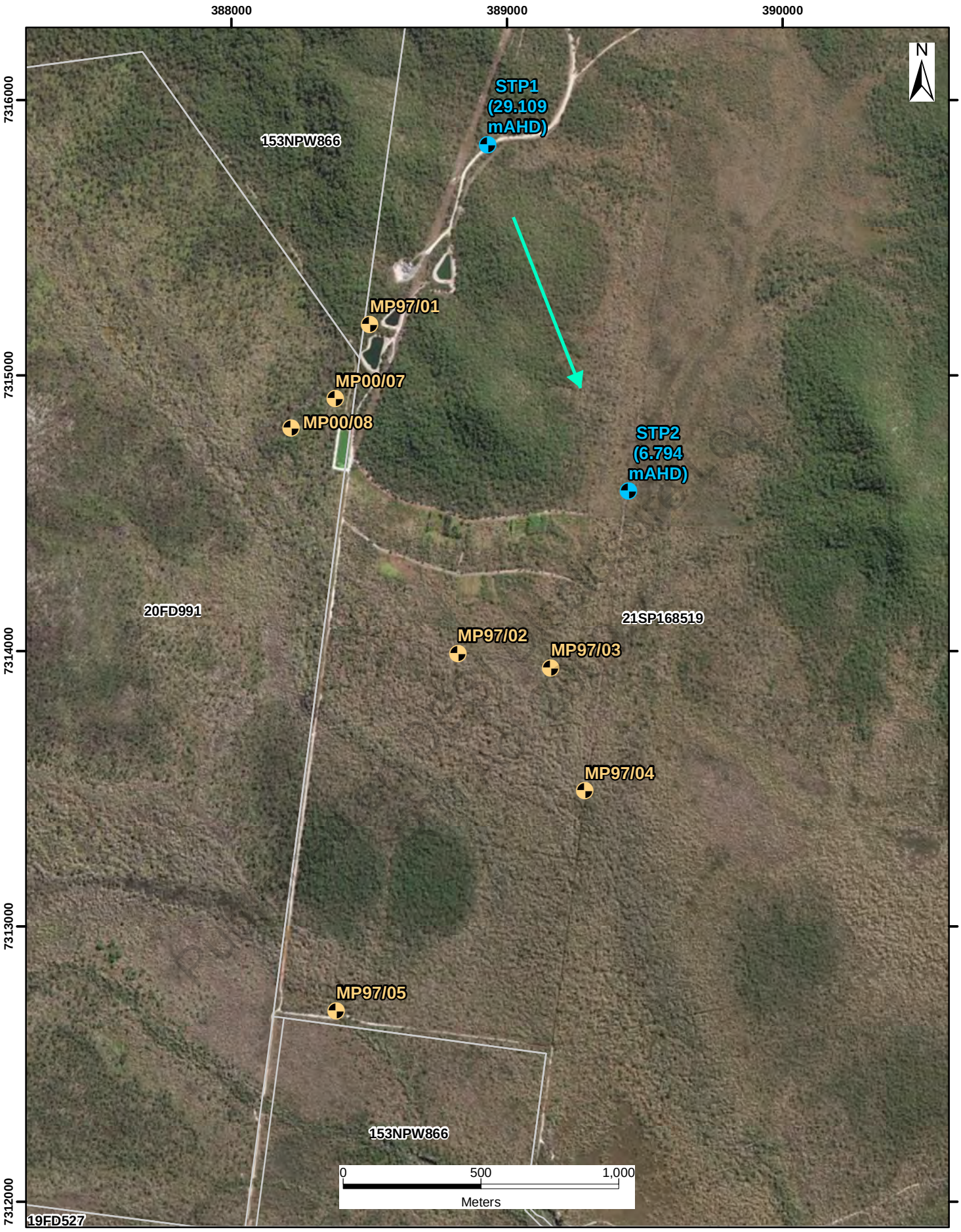
Sampled

Dry

WwTP Inferred Groundwater Flow Direction, July 2019	
Figure D-4	**Trility Pty Ltd**
Date: *14/10/2019*	**Author:** ersonal **Map Scale:** 1:18,000
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP

R:_Projects\C114943_Trility Pty Ltd\GIS\Agnes Water\J163599-01_Sept_2019_QR\mxd\FIG_6_4_WwTP_GW_Level_07_2019_191014.mxd



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

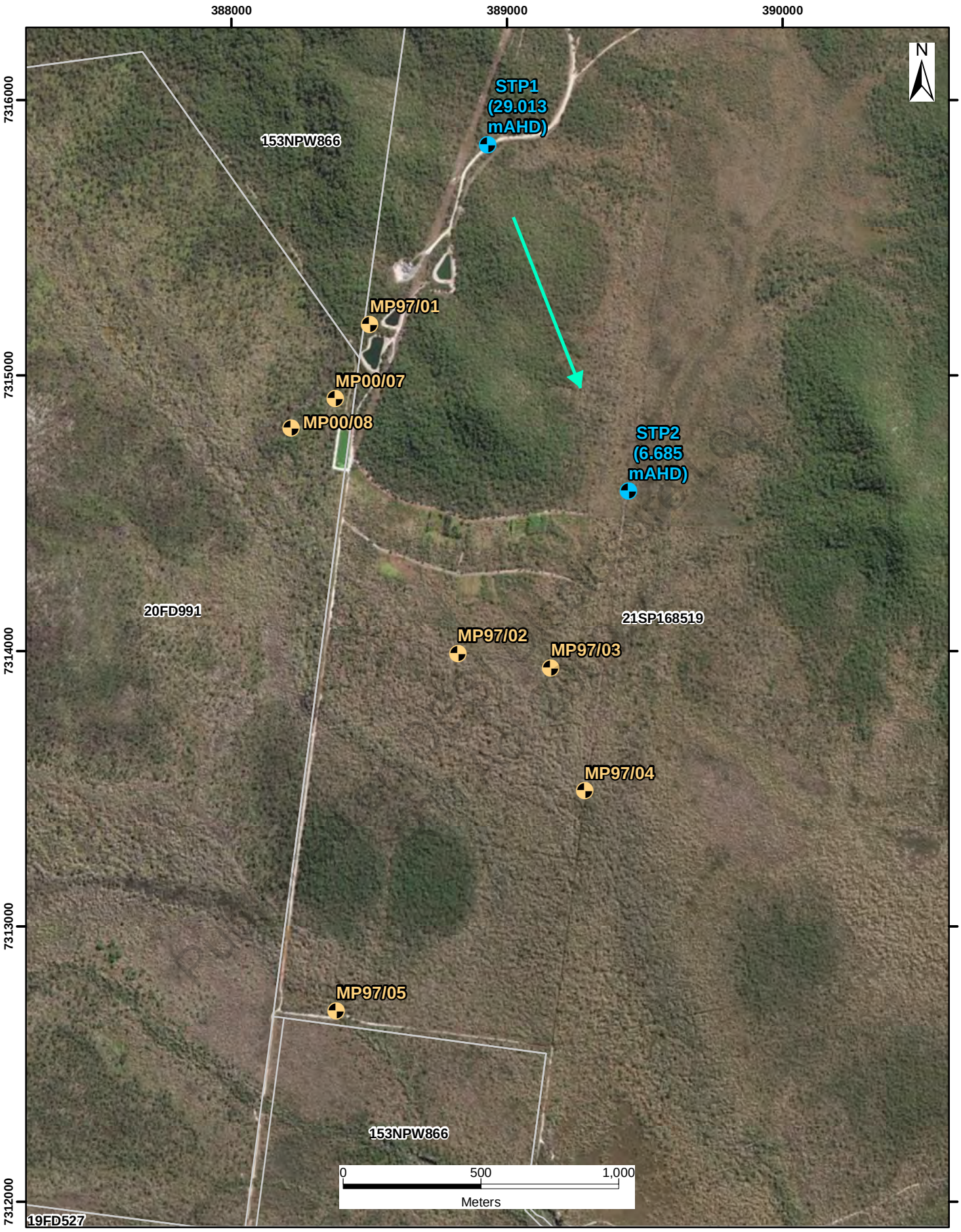
Sampled

Dry

WwTP Inferred Groundwater Flow Direction, August 2019

Figure D-5	**Trility Pty Ltd**
Date: *14/10/2019*	**Author:** ersonal **Map Scale:** 1:18,000
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

Sampled

Dry

WwTP Inferred Groundwater Flow Direction, September 2019

Figure D-6

Date: *14/10/2019*

Trility Pty Ltd

Author: personal

Map Scale: 1:18,000

Revision: R1

Coordinate System: GDA 1994 MGA Zone 56

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Lot Boundary

Groundwater Bore

Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, October 2019	
Figure D-7	**Trility Pty Ltd**
Date: *15/01/2020*	**Author:** Personal **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 Inferred Groundwater Flow Direction, November 2019	
Figure D-8	**Trility Pty Ltd**
Date: *15/01/2020*	**Author:** Personal In **Map Scale:** 1:800
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP

Lot Boundary

Groundwater Bore

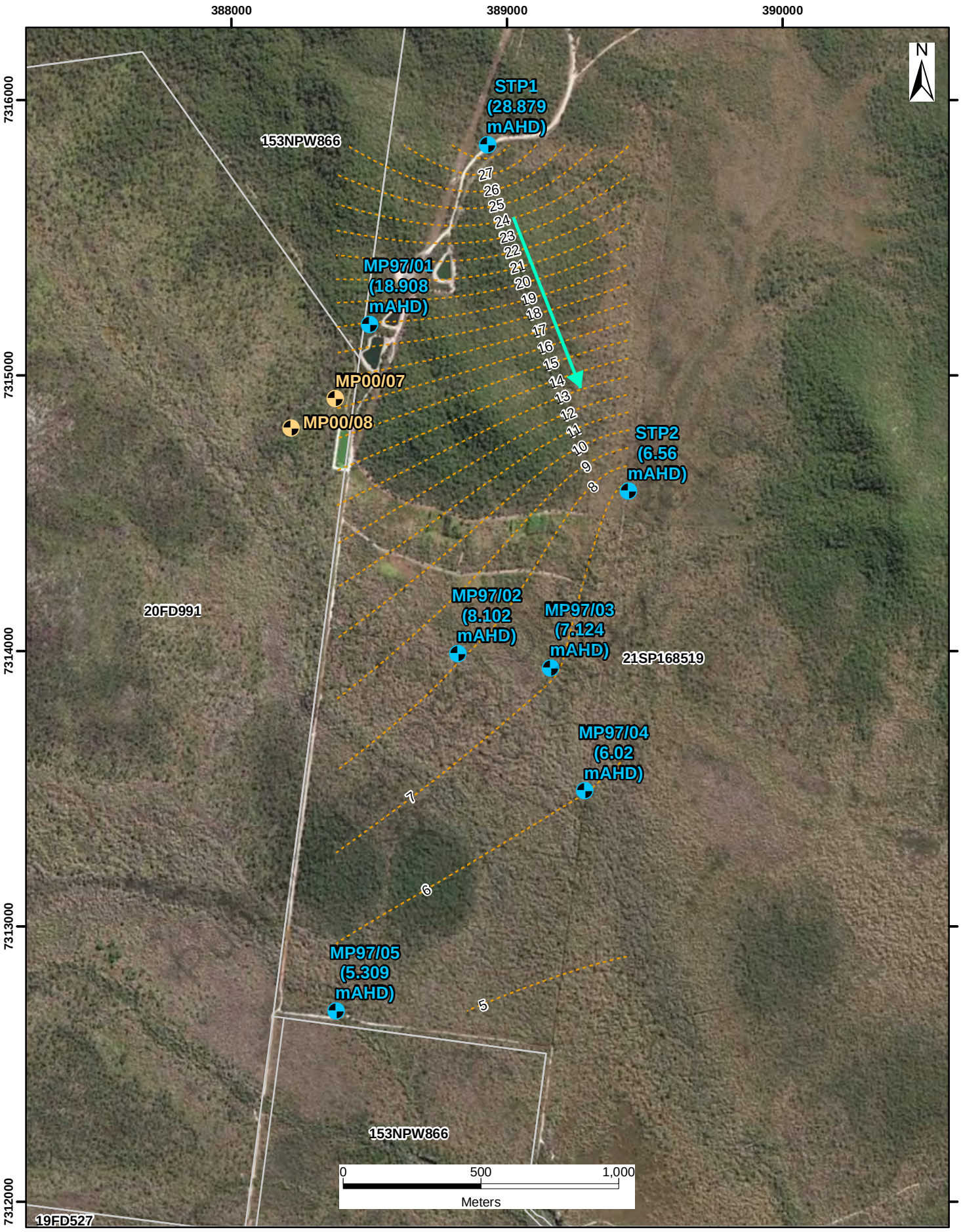
Greencap (May 2016)

Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, December 2019	
Figure D-9	**Trility Pty Ltd**
Date: *15/01/2020*	**Author** Personal Ir
	Map Scale: 1:800
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

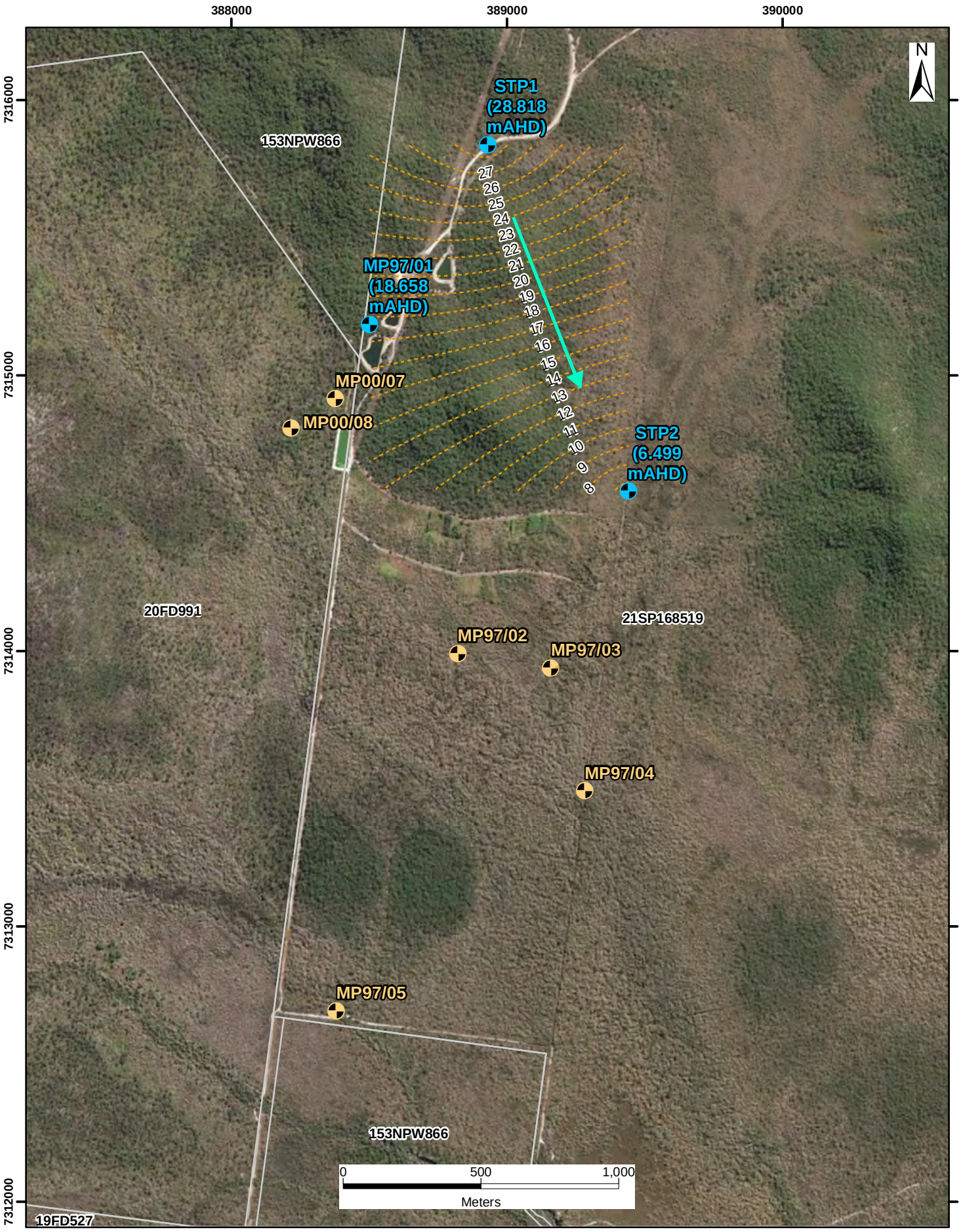
Groundwater Bore

Sampled

Dry

WwTP Inferred Groundwater Flow Direction, October 2019	
Figure D-10	**Trility Pty Ltd**
Date: *16/01/2020*	**Author:** ersonal **Map Scale:** 1:18,000
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

Sampled

Dry

WwTP Inferred Groundwater Flow Direction, November 2019

Figure D-11

Trility Pty Ltd

Date: *16/01/2020*

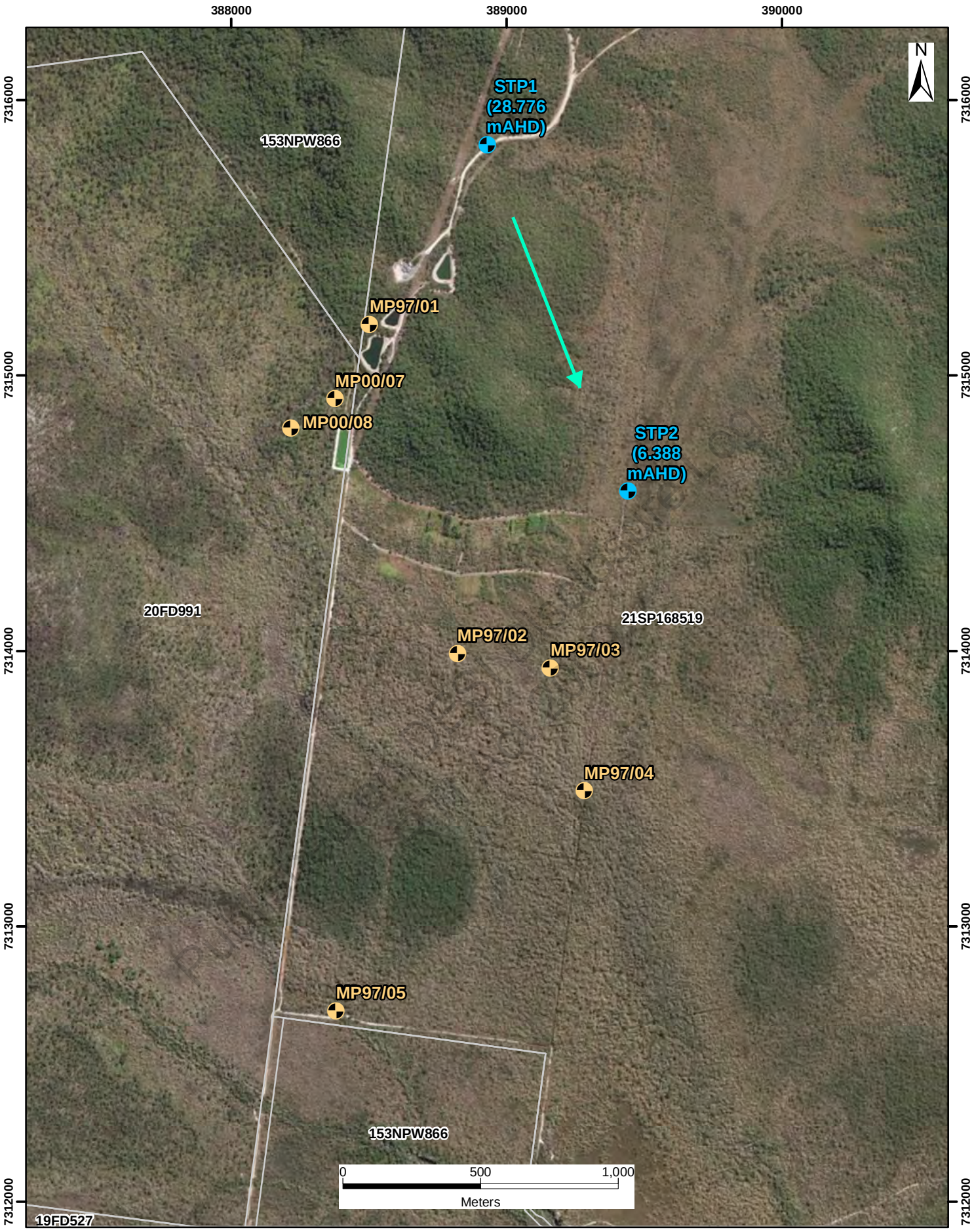
Author: Personal

Map Scale: 1:18,000

Revision: R1

Coordinate System: GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

Sampled

Dry

WwTP Inferred Groundwater Flow Direction, December 2019	
Figure D-12	**Trility Pty Ltd**
Date: *16/01/2020*	**Author:** Personal **Map Scale:** 1:18,000
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 Inferred Groundwater Flow Direction, January 2020	
Figure D-13	**Trility Pty Ltd**
Date: *4/06/2020*	**Author** Personal
Revision: R1	**Map Scale:** 1:800
	Coordinate System: GDA 1994 MGA Zone 56

GREENCAP

Lot Boundary

Groundwater Bore

Greencap (May 2016)

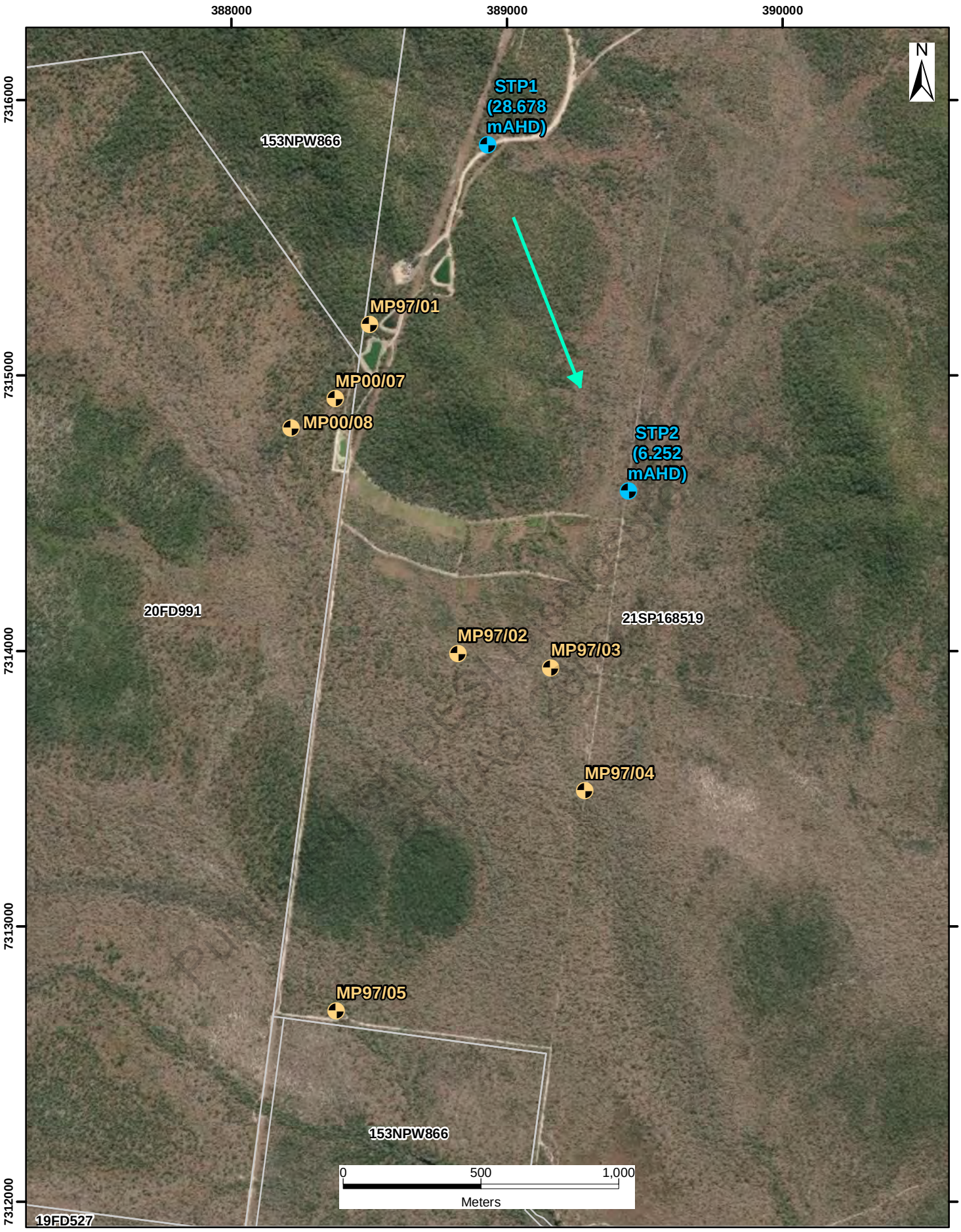
Groundwater Level Contours (mAHD)

Inferred Groundwater Flow Direction

IWTP Inferred Groundwater Flow Direction, February 2020

Figure D-14	**Trility Pty Ltd**
Date: *4/06/2020*	**Author:** ersonal
	Map Scale: 1:800
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Inferred Groundwater Flow Direction

Groundwater Bore

Sampled

Dry

WwTP Inferred Groundwater Flow Direction, January 2020

Figure D-15

Date: *4/06/2020*

Trility Pty Ltd

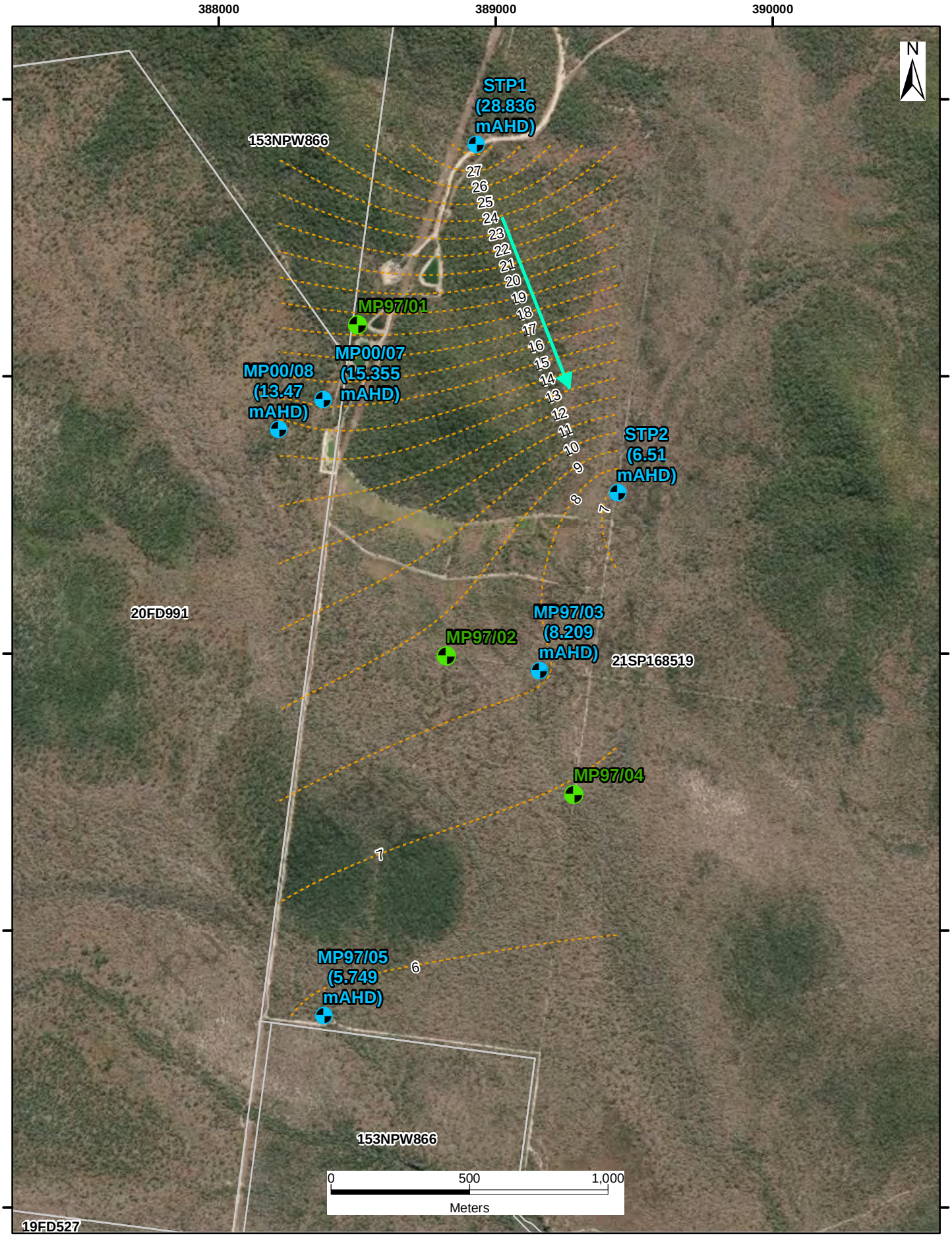
Author: Personal

Map Scale: 1:18,000

Revision: R1

Coordinate System: GDA 1994 MGA Zone 56

GREENCAP



Lot Boundary

Groundwater Level Contours (mAHD)

Groundwater Bore

Sampled

Flooded

Inferred Groundwater Flow Direction

WwTP Inferred Groundwater Flow Direction, February 2020

Figure D-16	**Trility Pty Ltd**
Date: *4/06/2020*	**Author:** ersonal
	Map Scale: 1:18,000
Revision: R1	**Coordinate System:** GDA 1994 MGA Zone 56

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Appendix E: Graphs

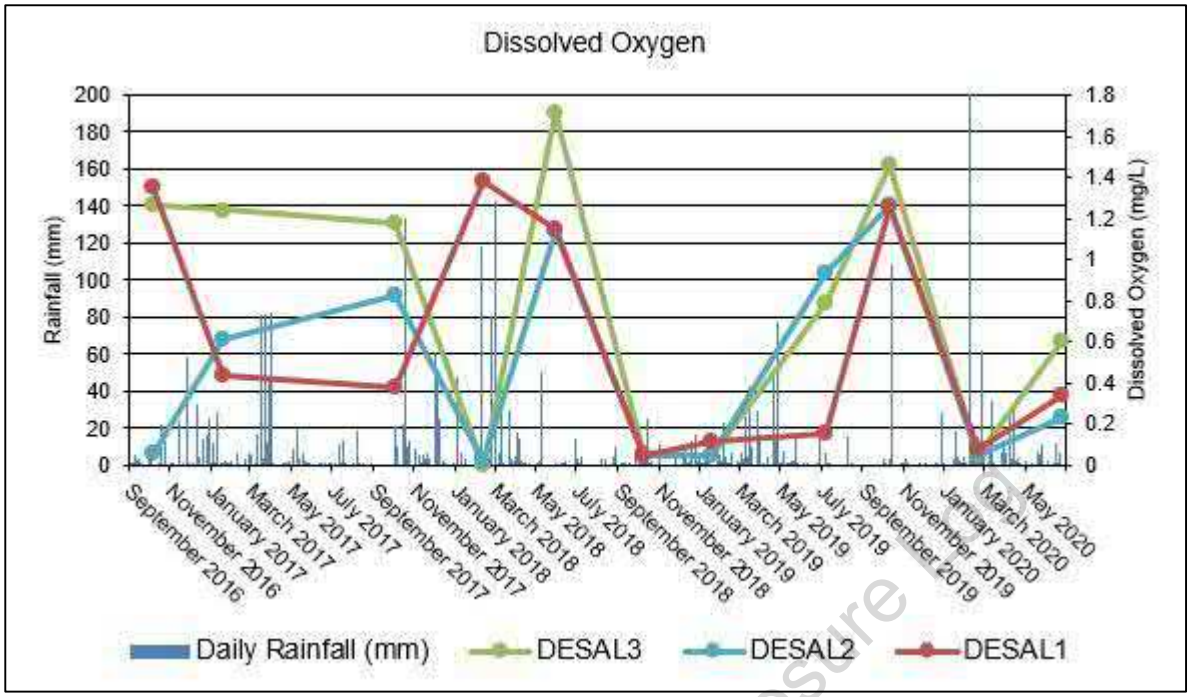

Figure 1 IWTP Dissolved Oxygen, September 2016 – June 2020

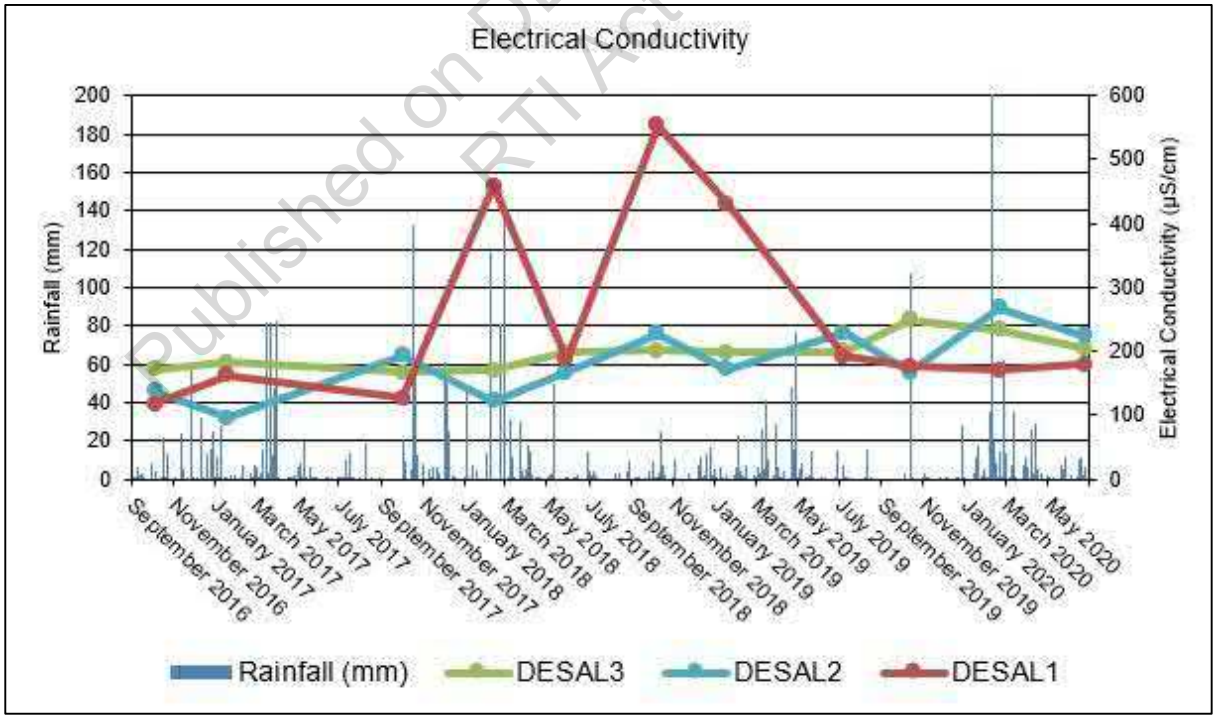

Figure 2 IWTP Electrical Conductivity, September 2016 – June 2020

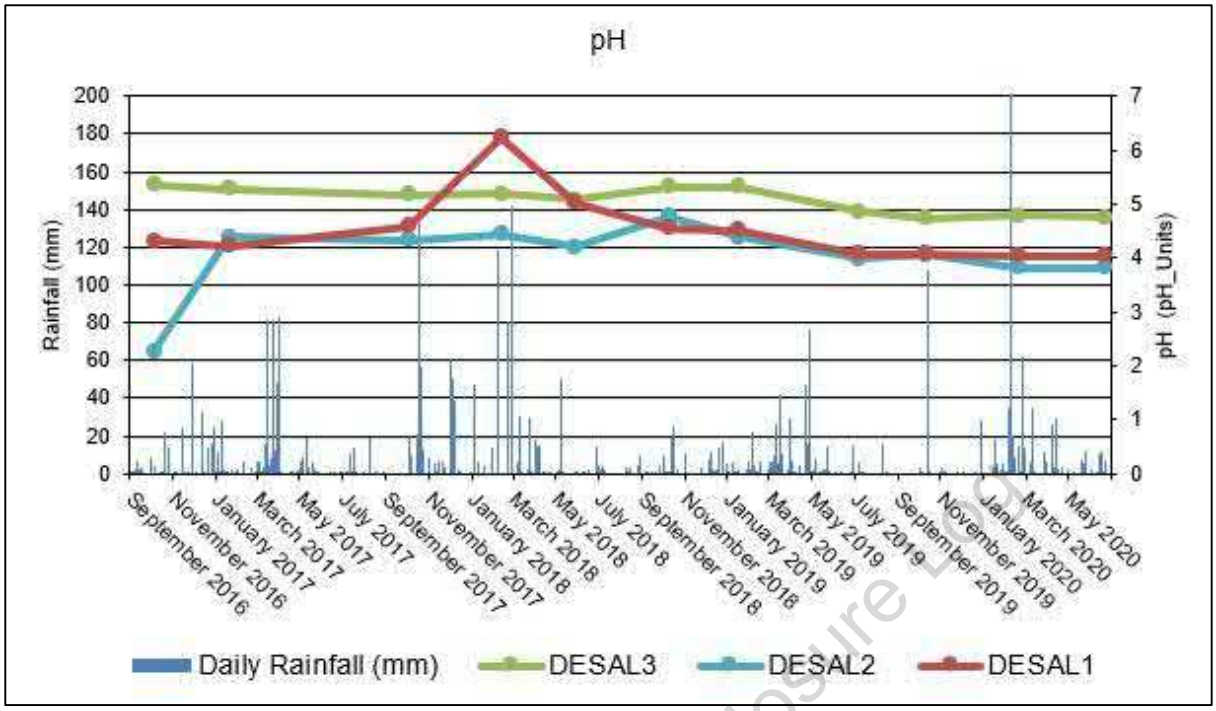

Figure 3 IWTP pH, September 2016 – June 2020

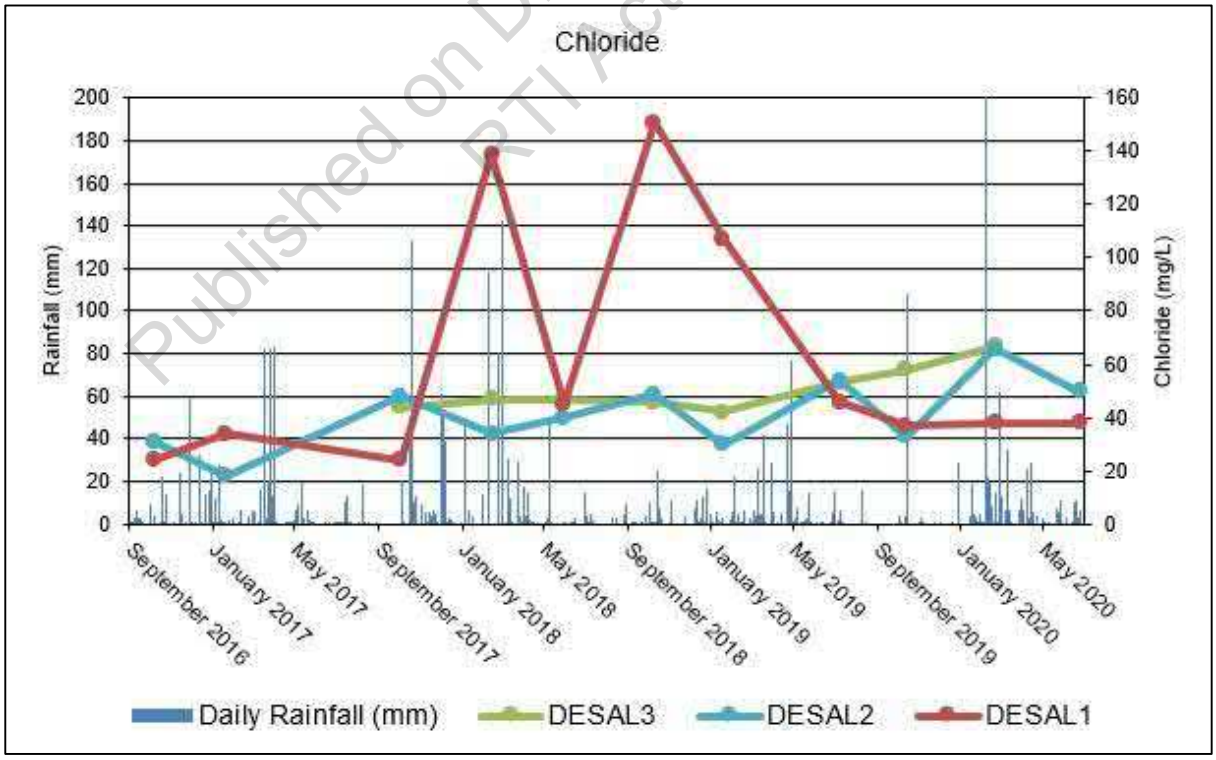

Figure 4 IWTP Chloride, September 2016 – June 2020

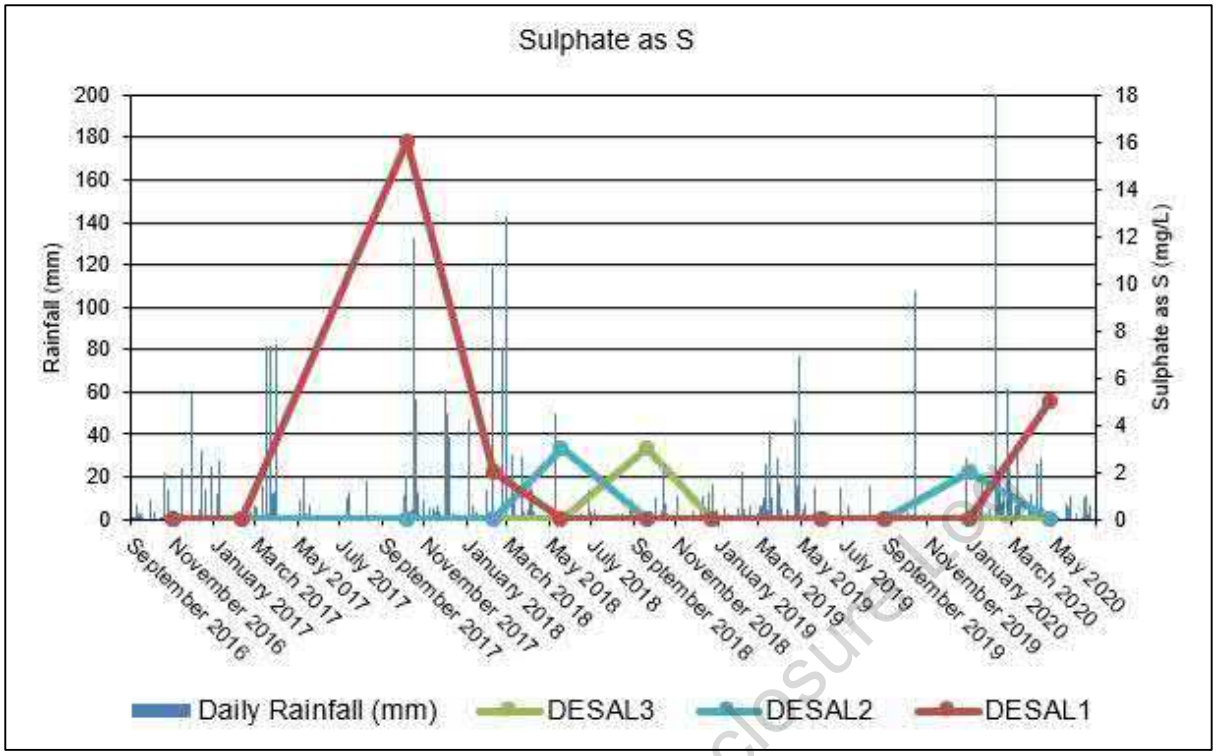

Figure 5 IWTP Sulphate, September 2016 – June 2020

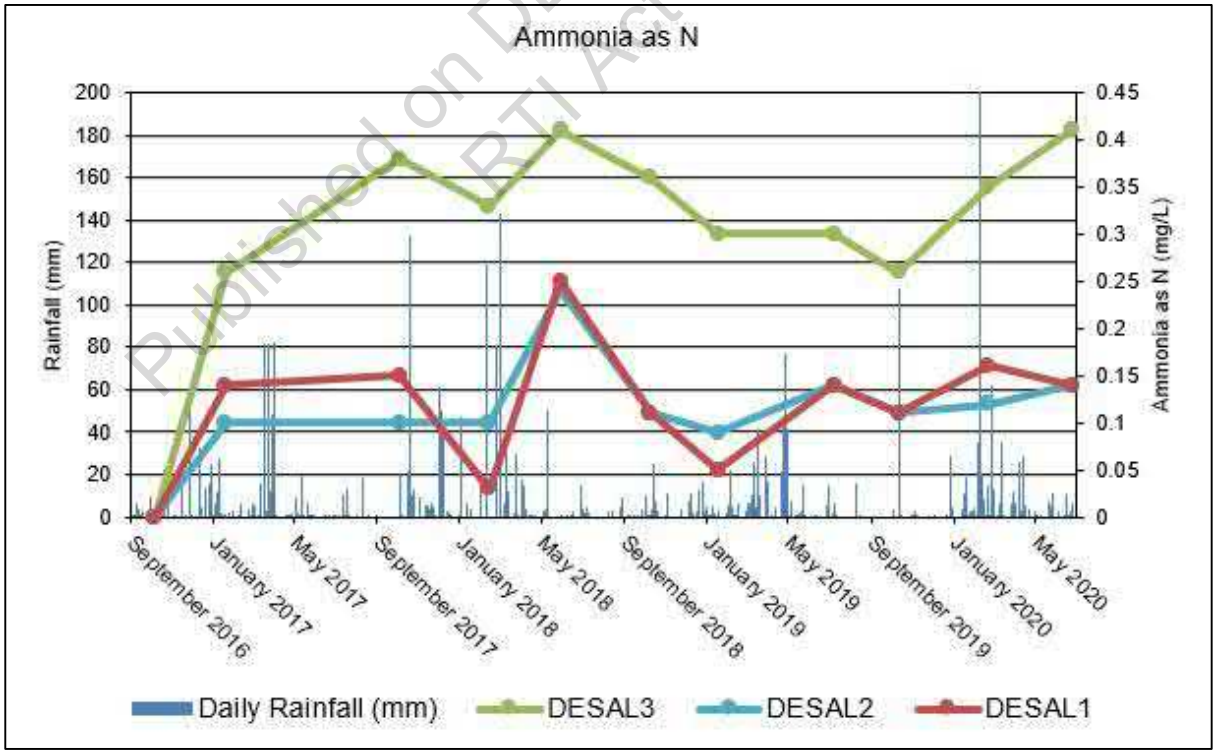

Figure 6 IWTP Ammonia, September 2016 – June 2020

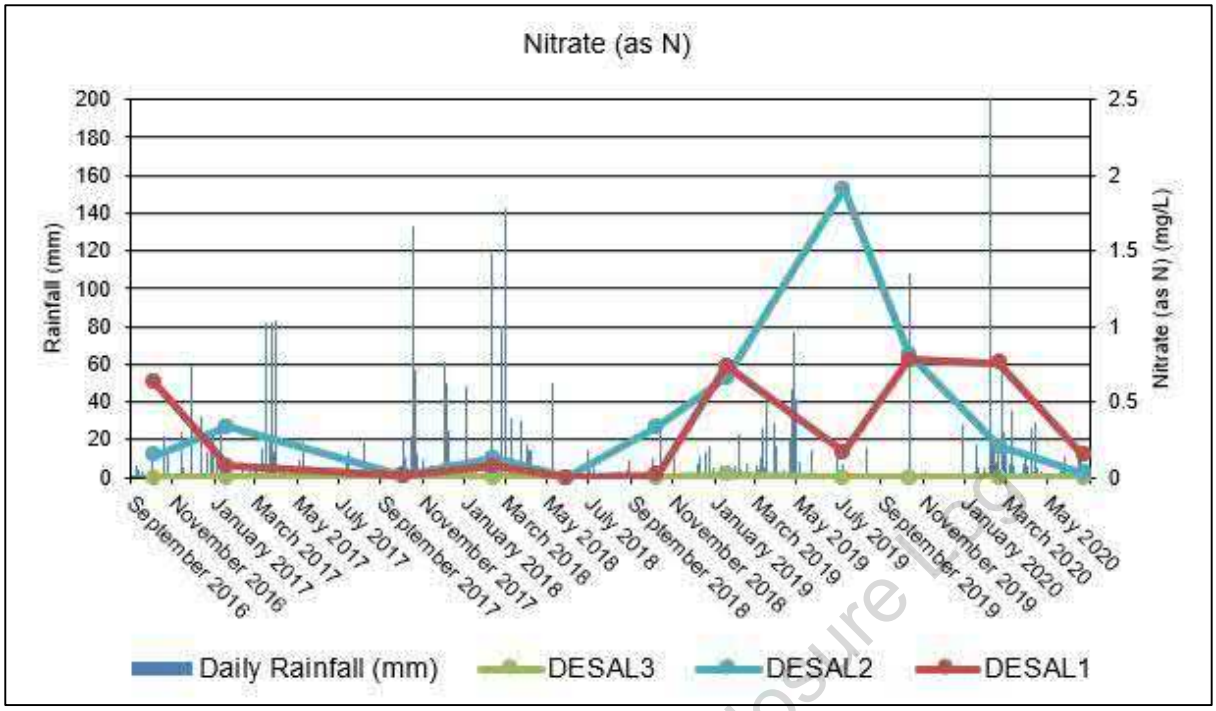

Figure 7 IWTP Nitrate, September 2016 – June 2020

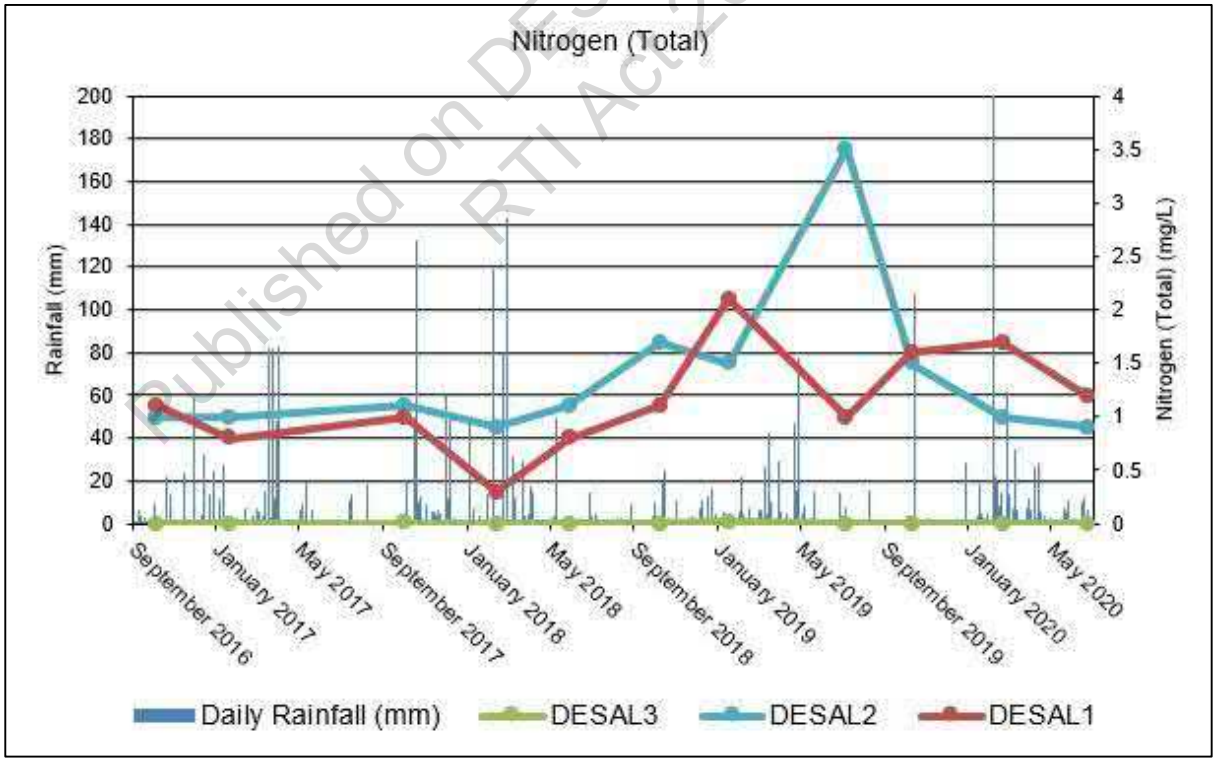

Figure 8 IWTP Total Nitrogen, September 2016 – June 2020

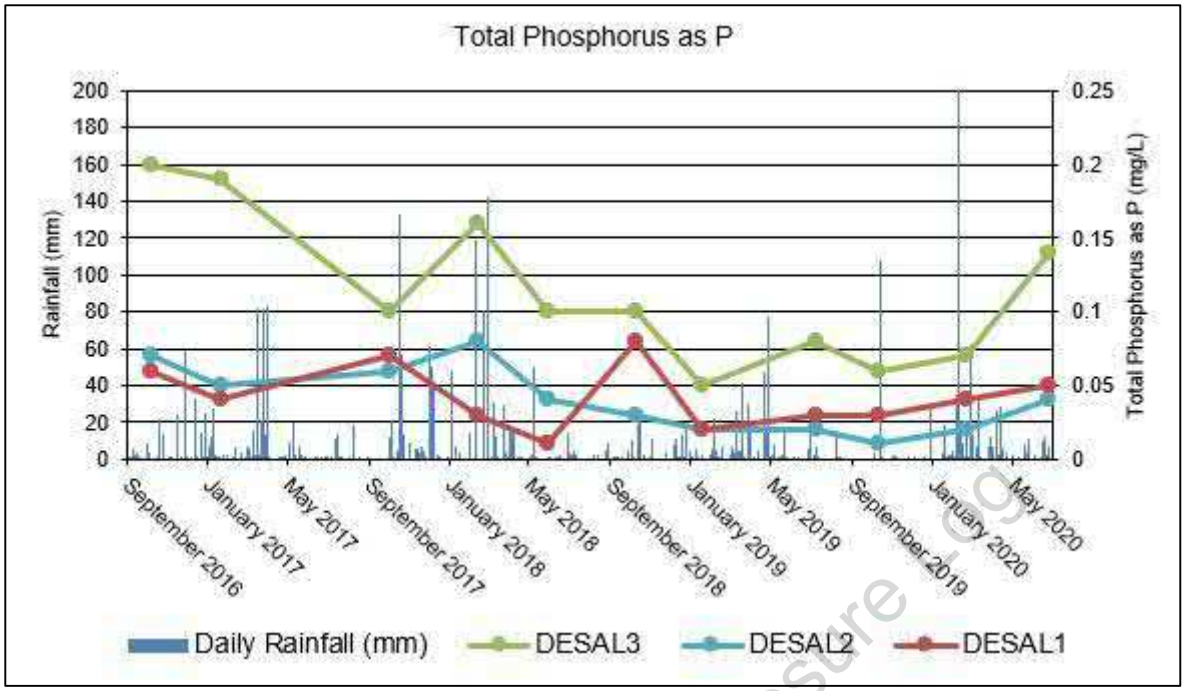

Figure 9 IWTP Total Phosphorus, September 2016 – June 2020

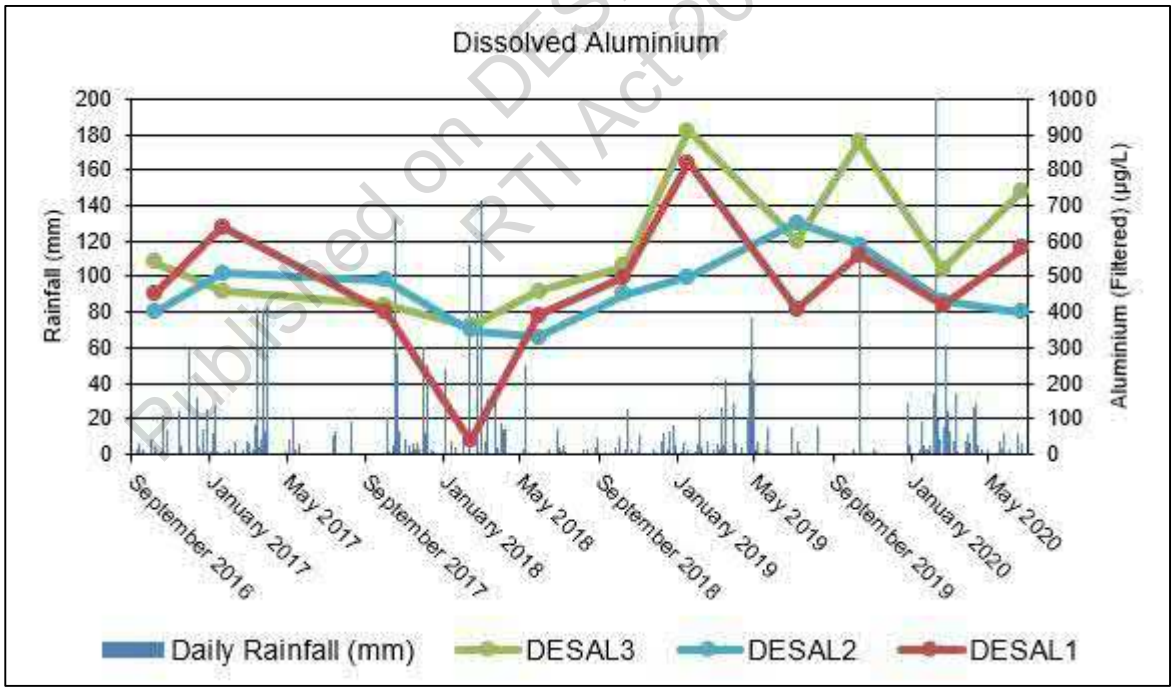

Figure 10 IWTP Dissolved Aluminium, September 2016 – June 2020

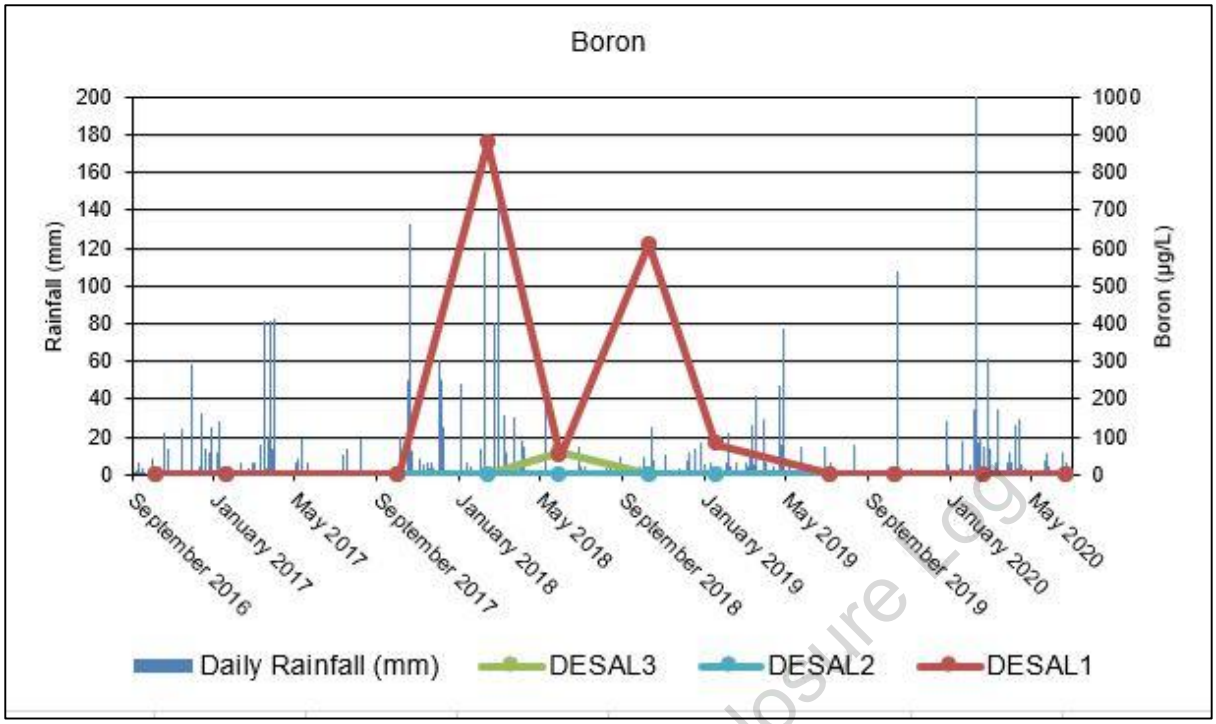

Figure 11 IWTP Total Boron, September 2016 – June 2020

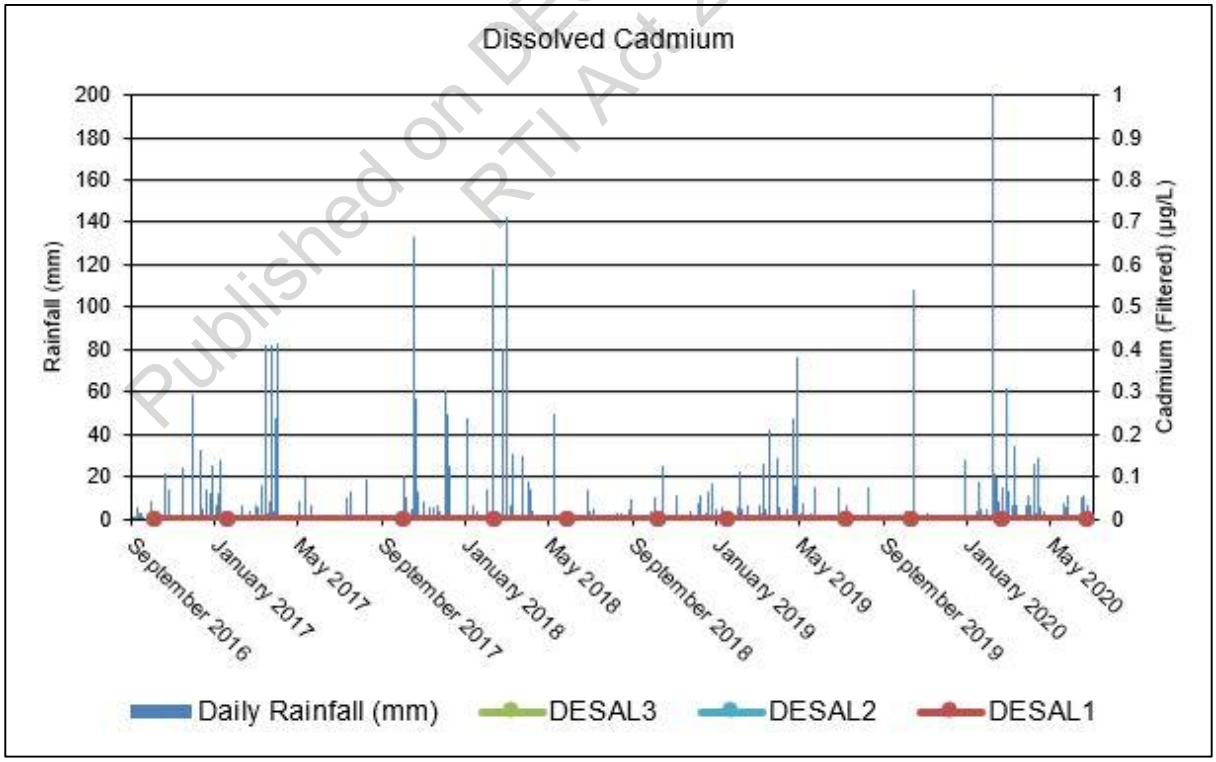

Figure 12 IWTP Dissolved Cadmium, September 2016 – June 2020

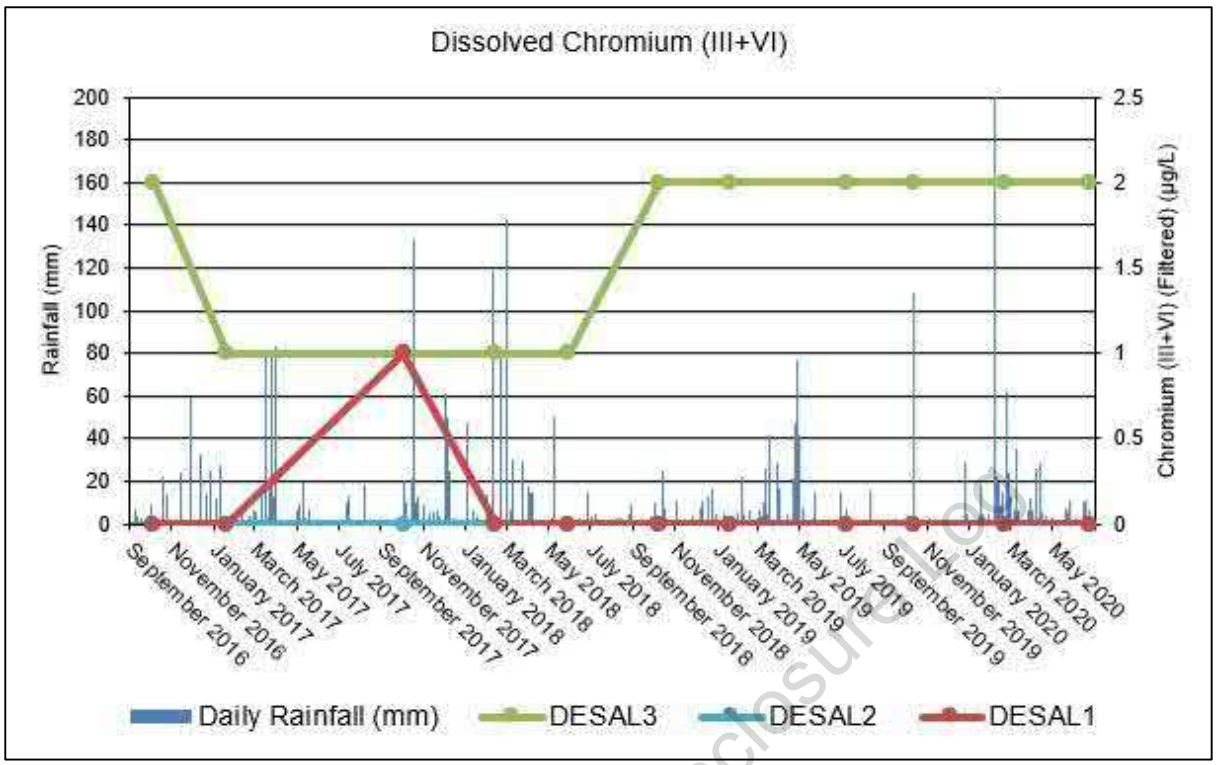

Figure 13 IWTP Dissolved Chromium, September 2016 – June 2019

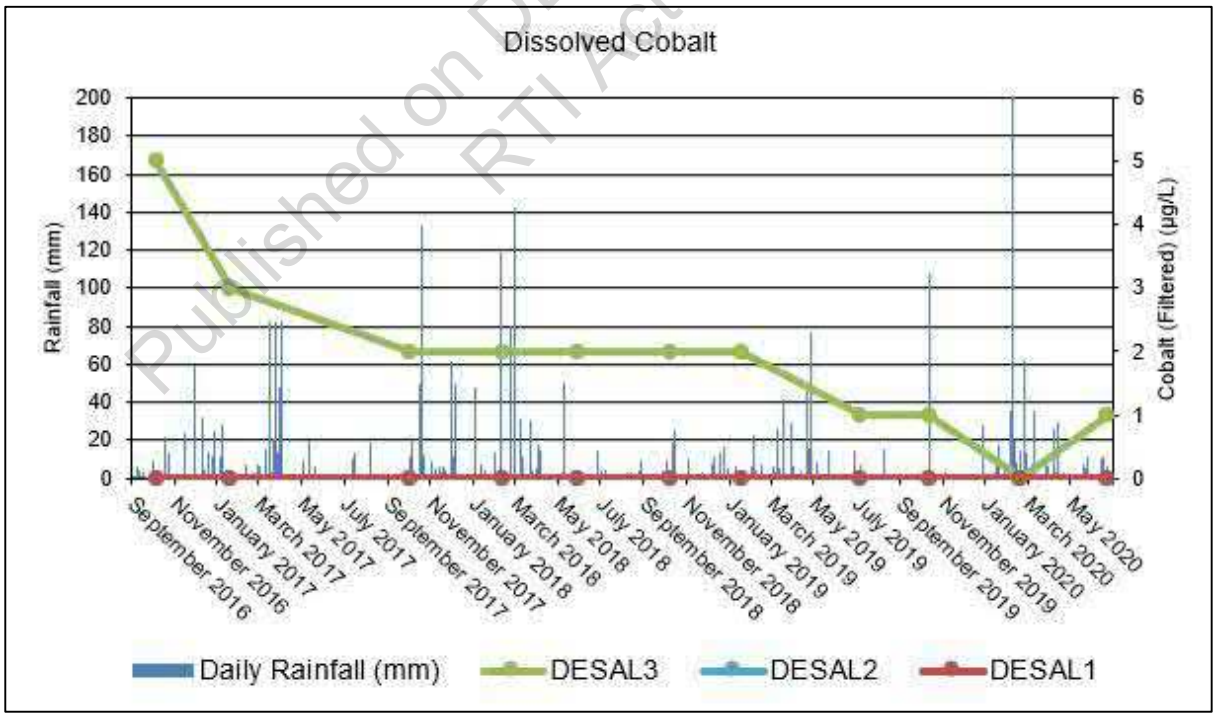

Figure 14 IWTP Dissolved Cobalt, September 2016 – June 2020

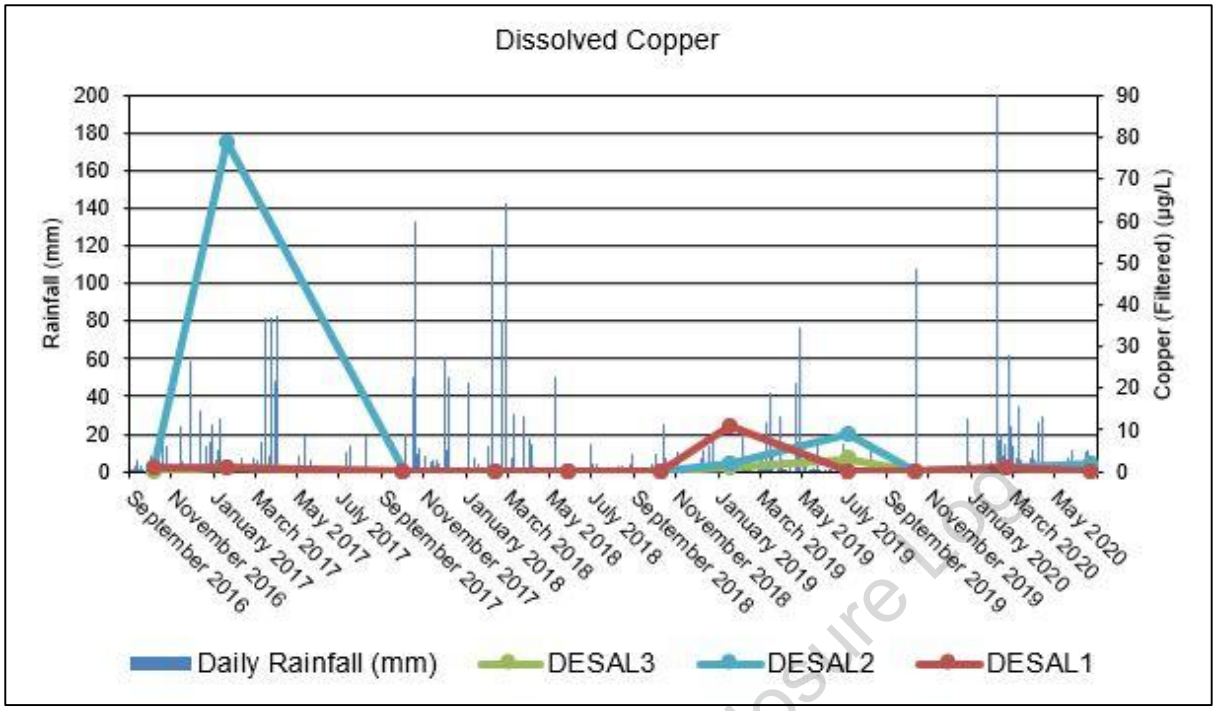

Figure 15 IWTP Dissolved Copper, September 2016 – June 2020

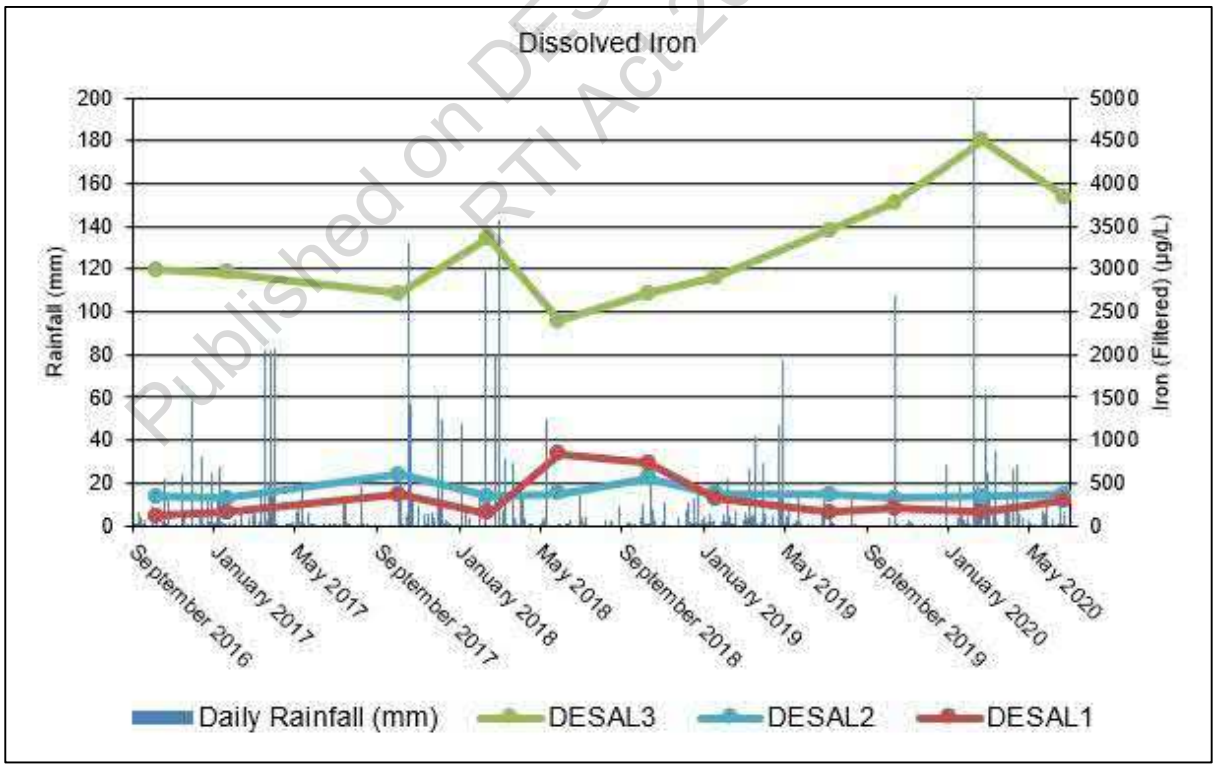

Figure 16 IWTP Dissolved Iron, September 2016 – June 2020

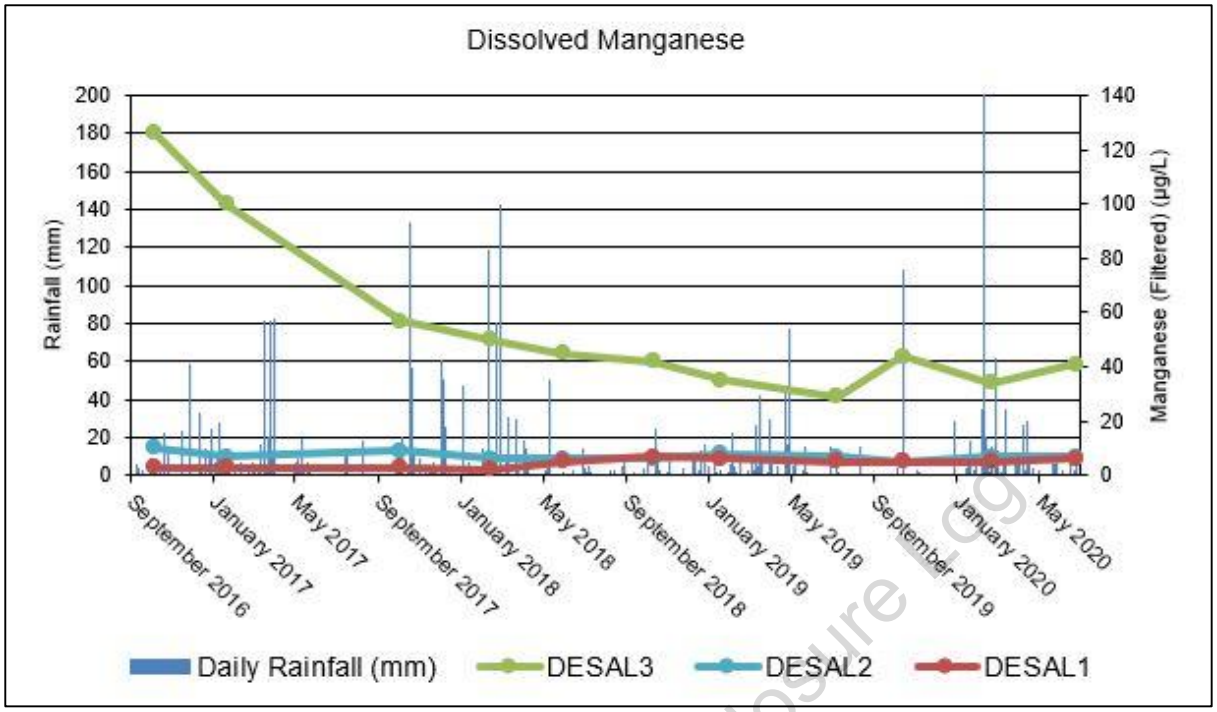

Figure 17 IWTP Dissolved Manganese, September 2016 – June 2020

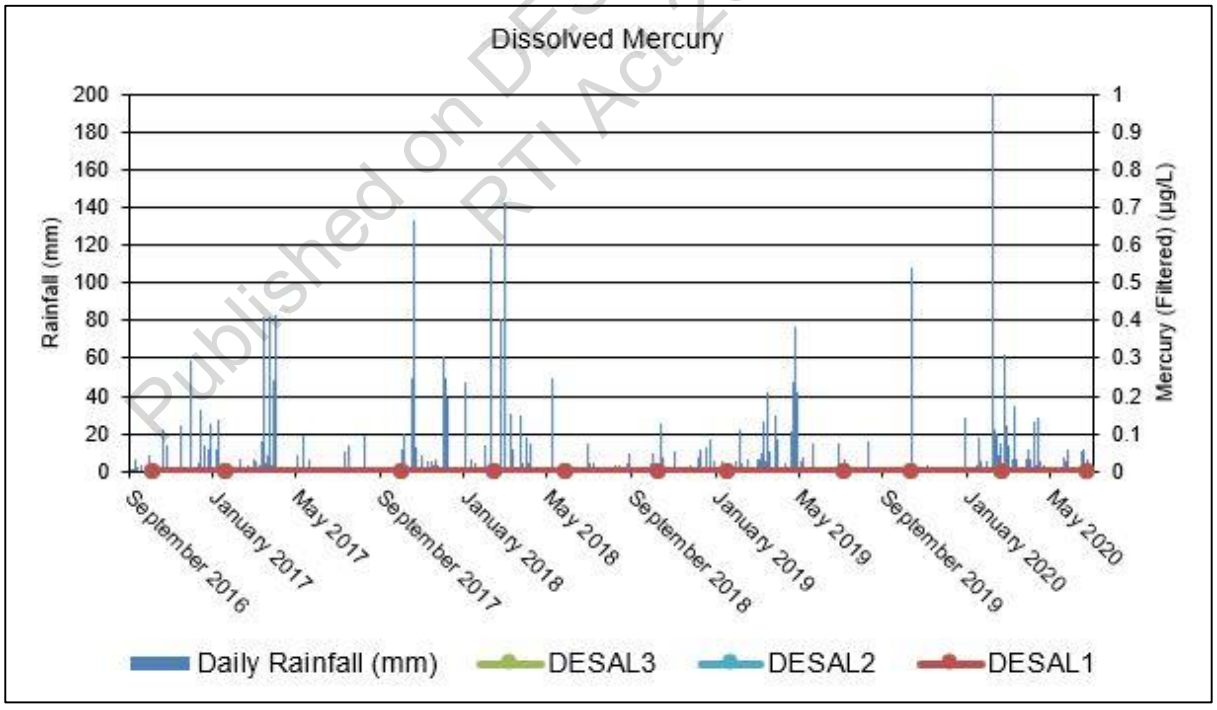

Figure 18 IWTP Dissolved Mercury, September 2016 – June 2020

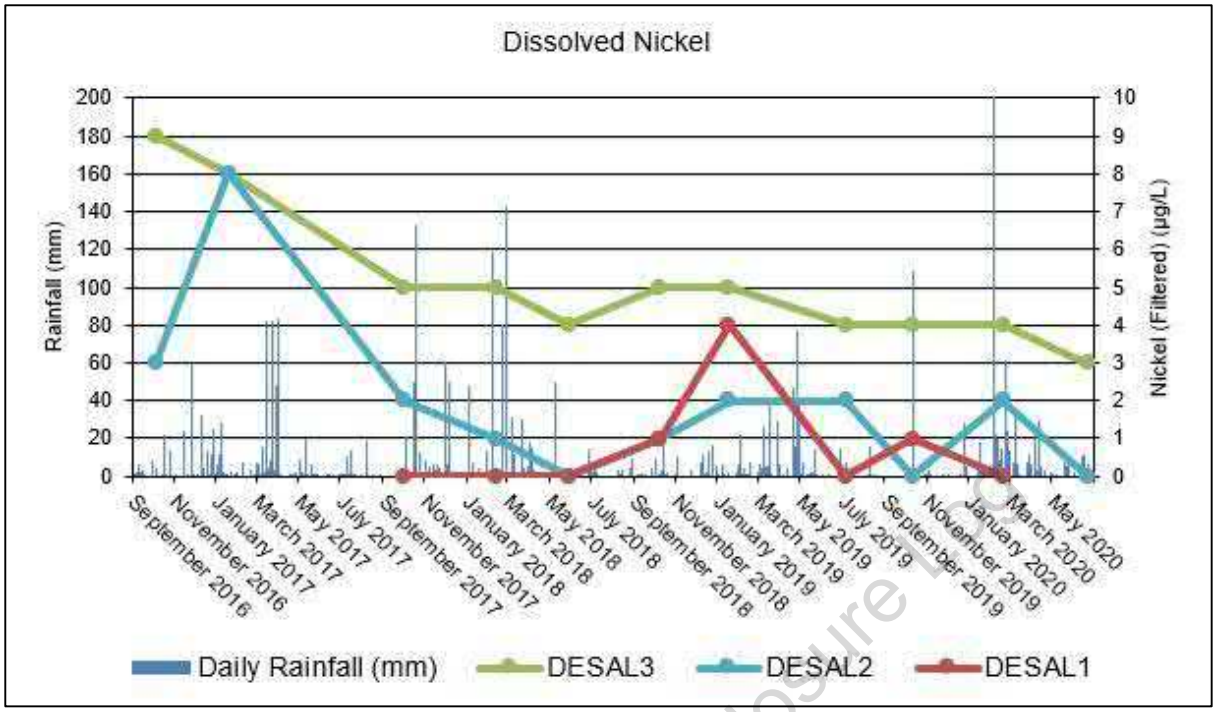

Figure 19 IWTP Dissolved Nickel, September 2016 – June 2020

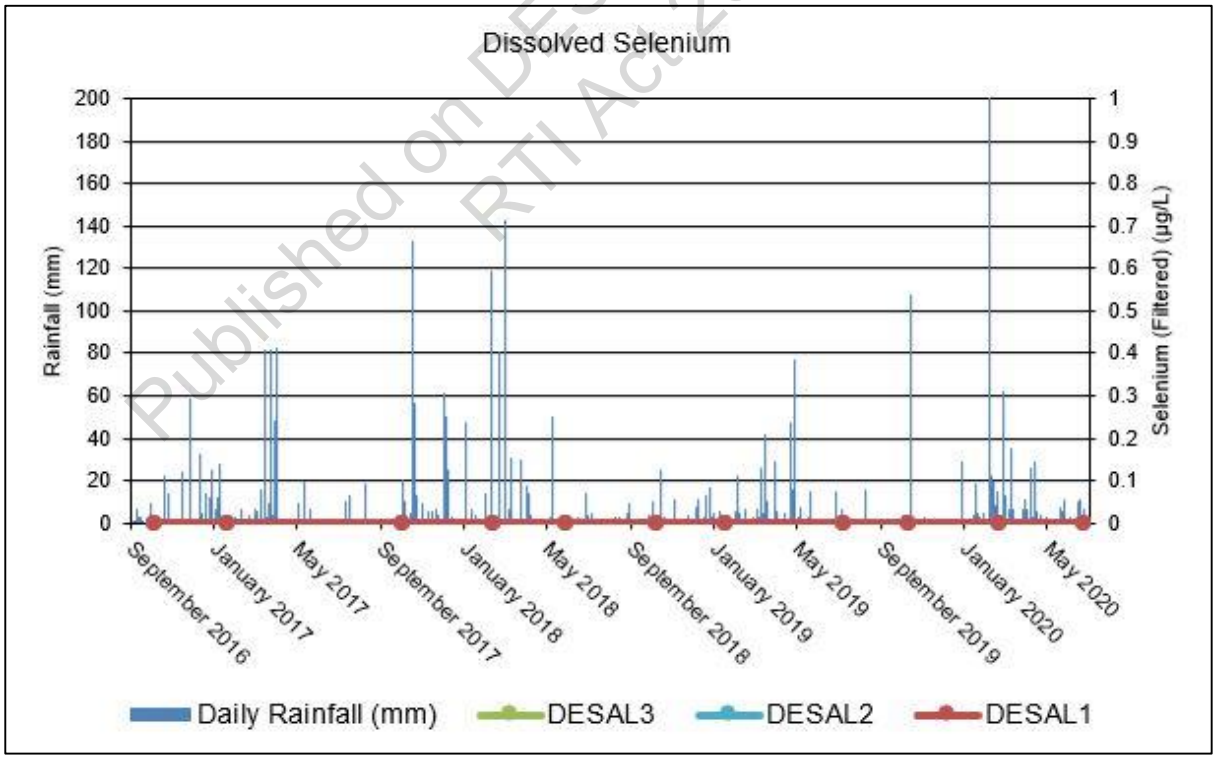

Figure 20 IWTP Dissolved Selenium, September 2016 – June 2020

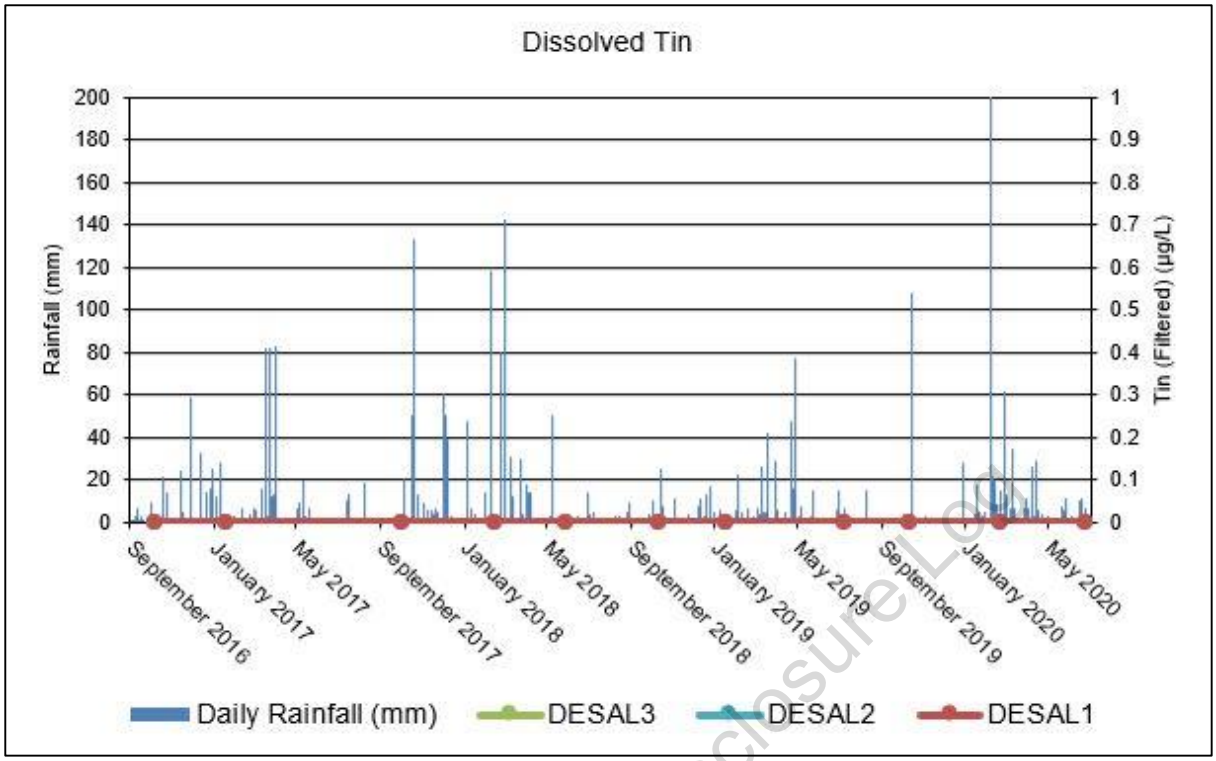

Figure 21 IWTP Dissolved Tin, September 2016 – June 2020

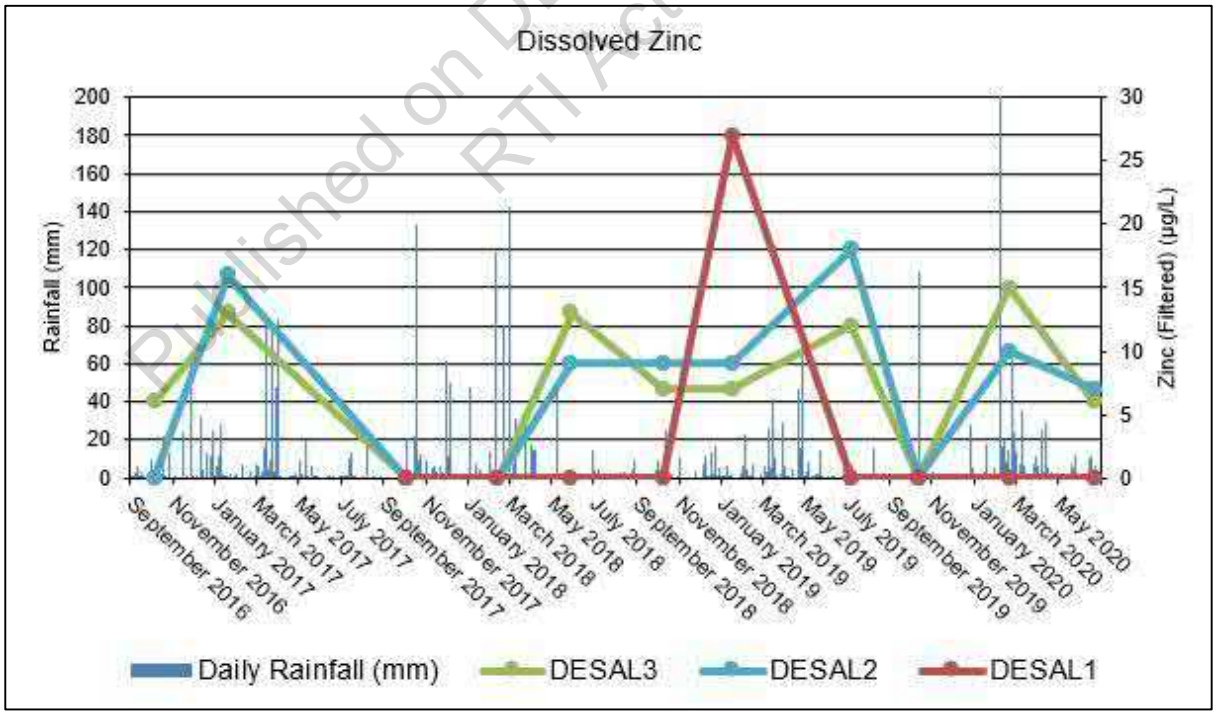

Figure 22 IWTP Dissolved Zinc, September 2016 – June 2020

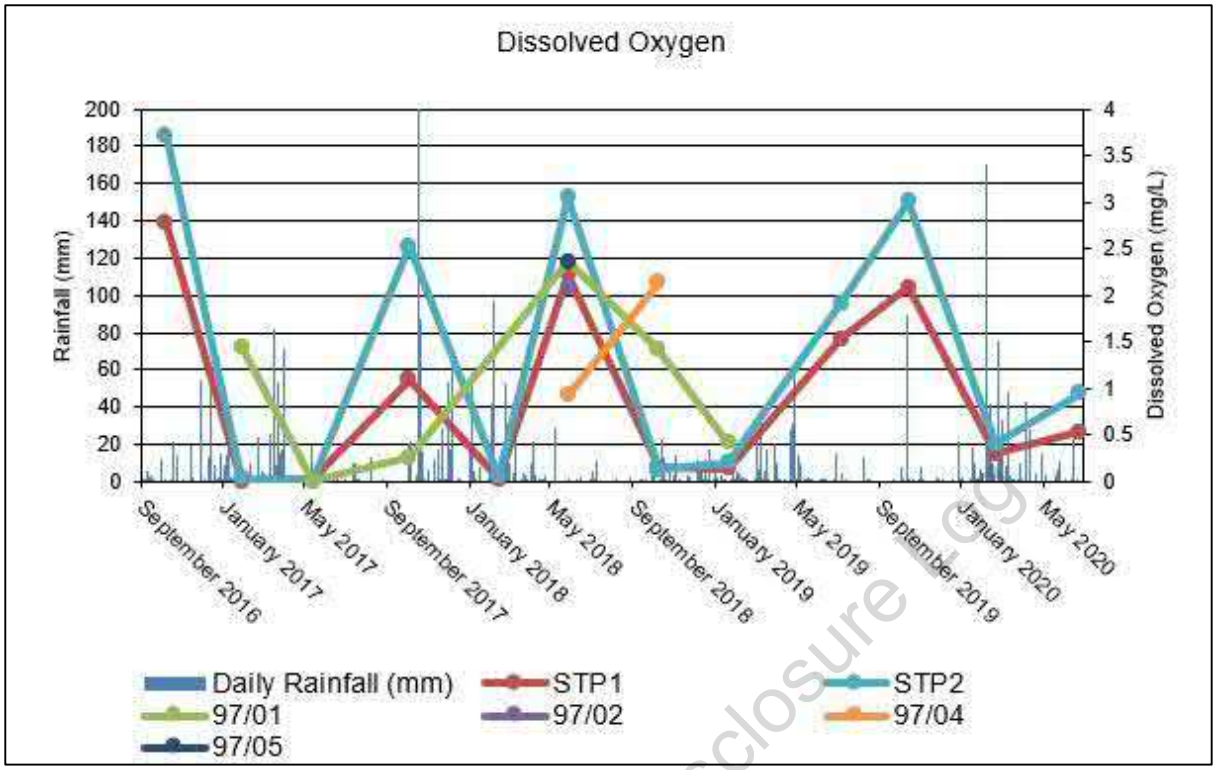

Figure 23 WwTP Dissolved Oxygen, September 2016 – June 2020

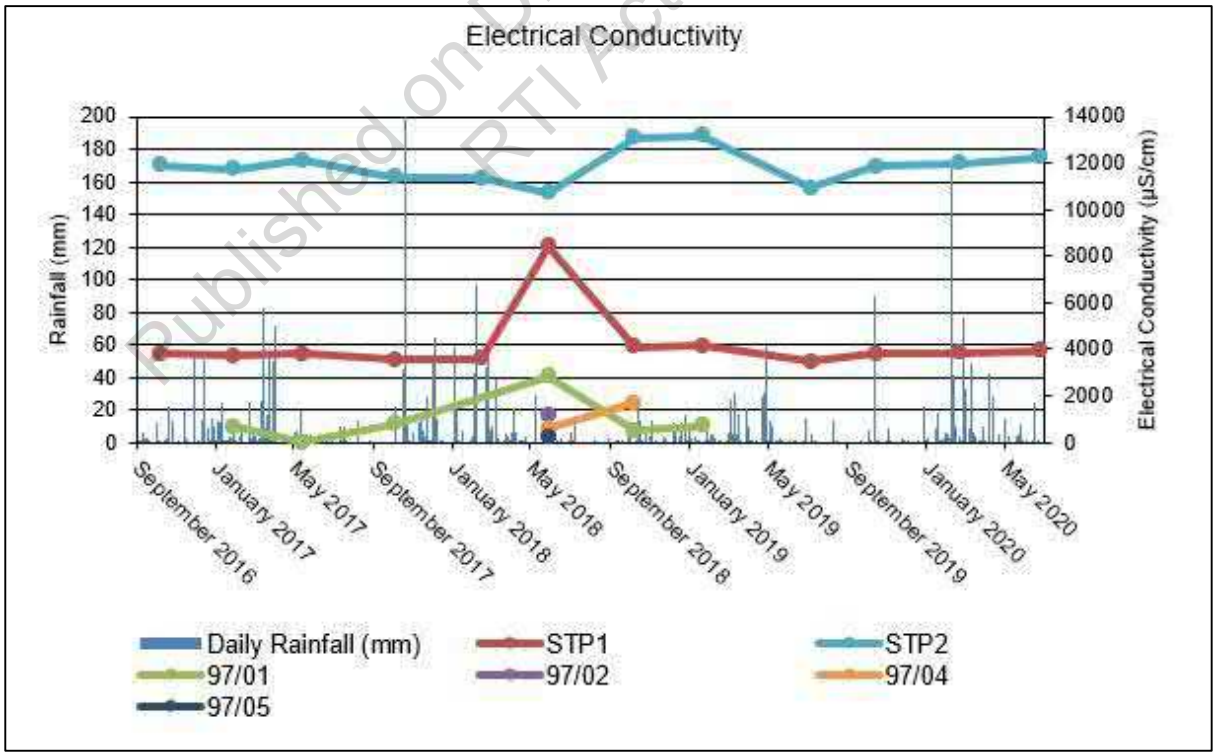

Figure 24 WwTP Electrical Conductivity, September 2016 – June 2020

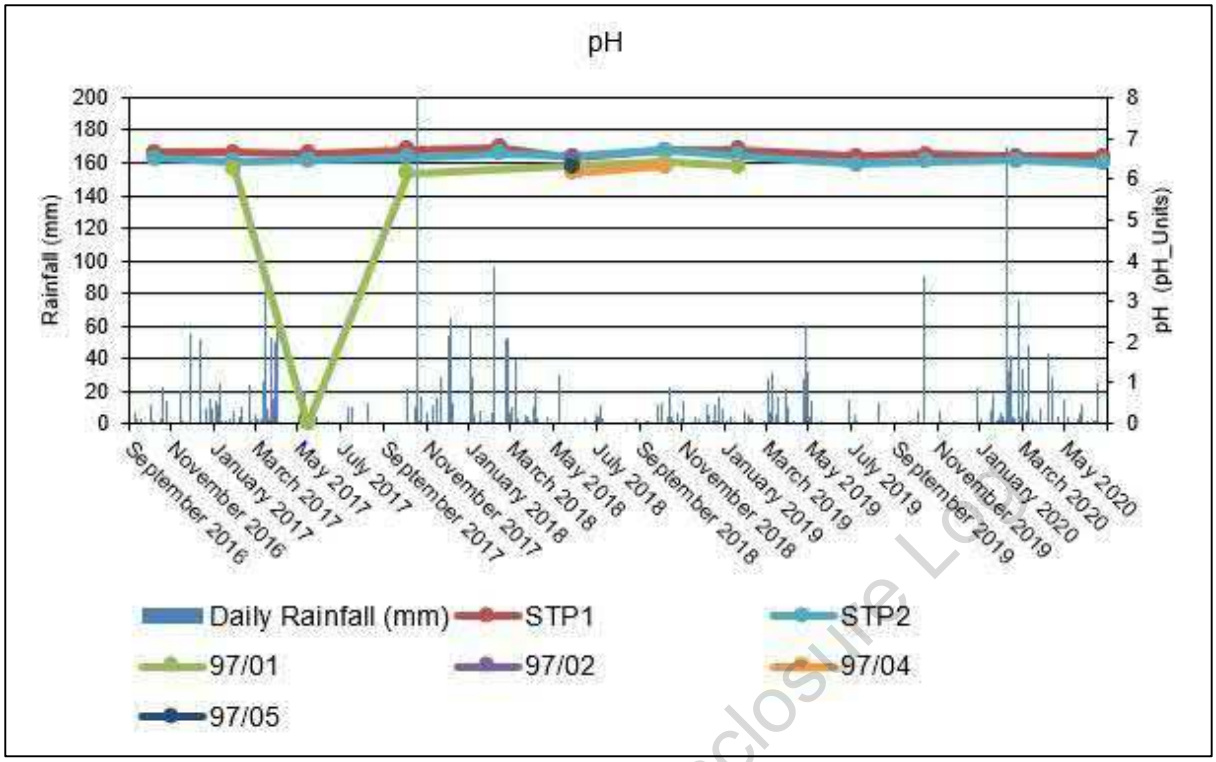

Figure 25 WwTP pH, September 2016 – June 2020

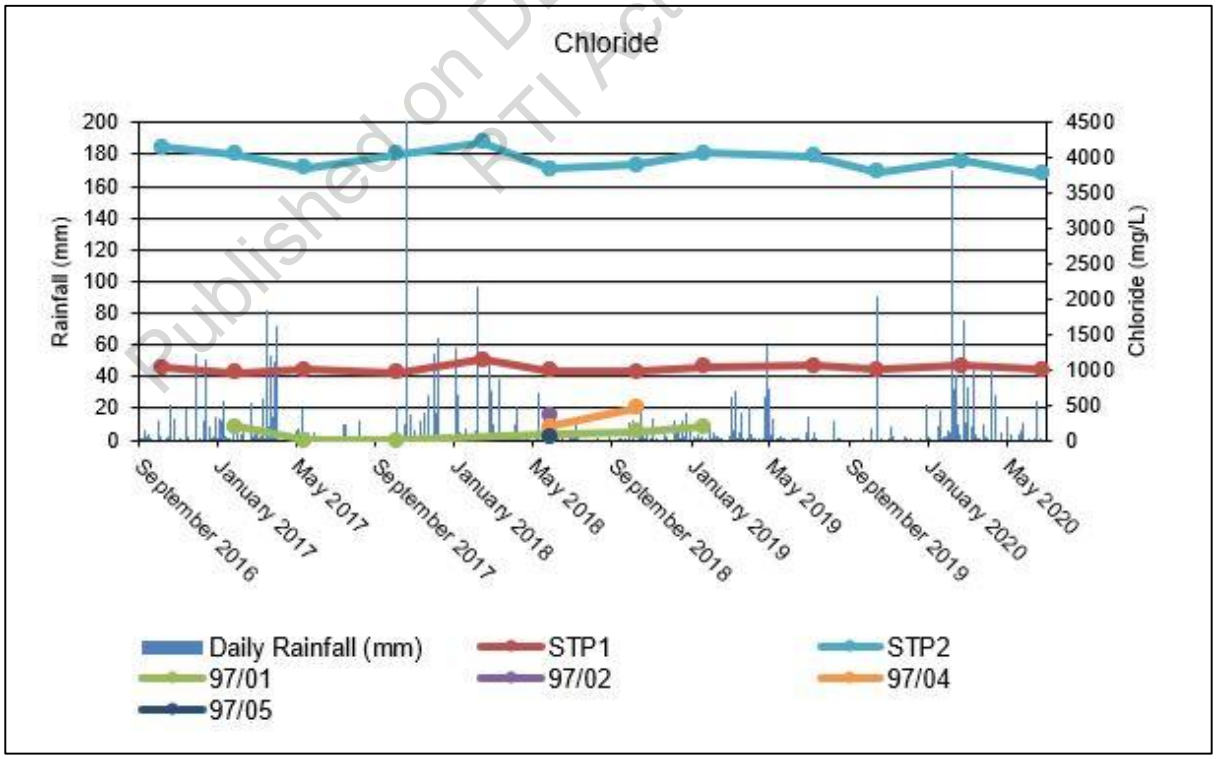

Figure 26 WwTP Chloride, September 2016 – June 2020

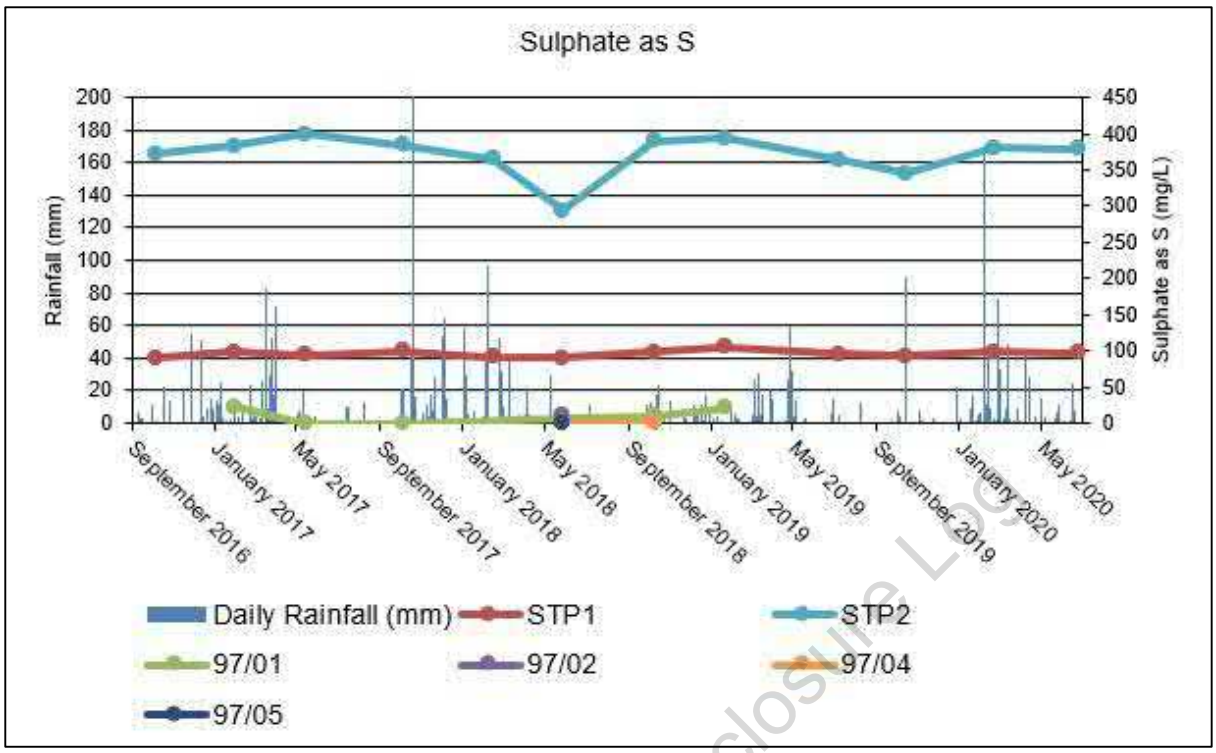

Figure 27 WwTP Sulphate, September 2016 – June 2020

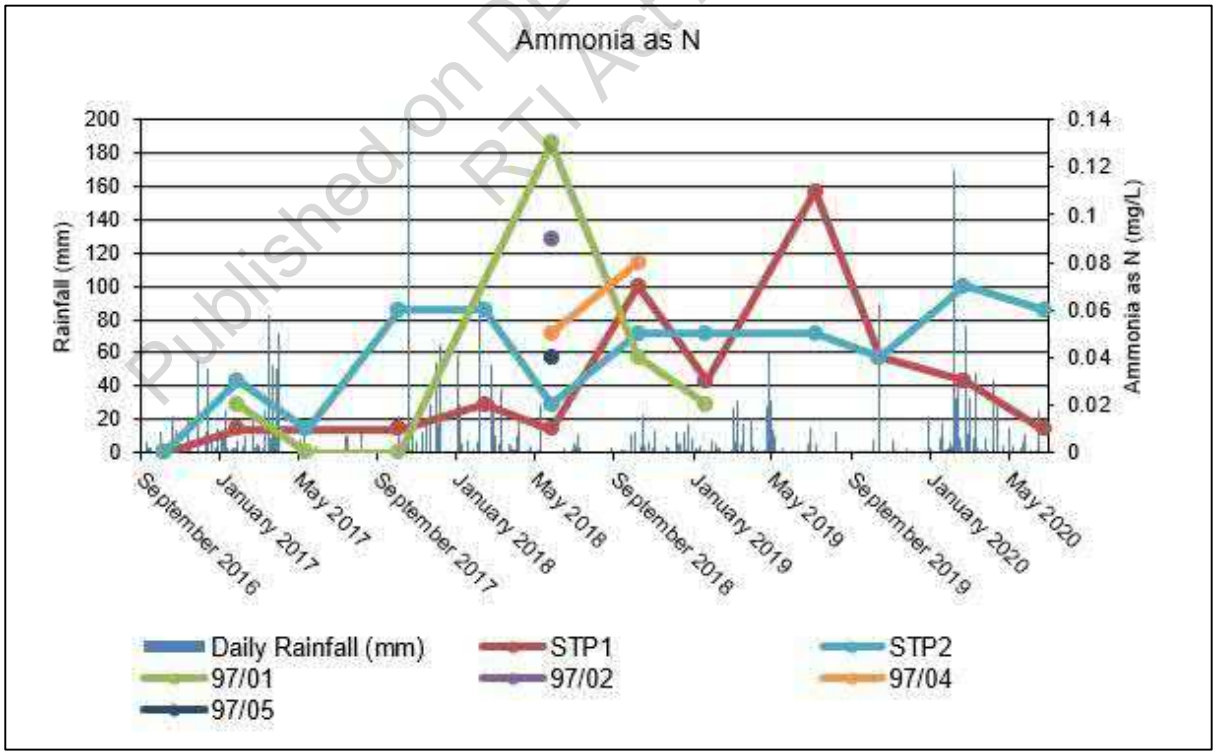

Figure 28 WwTP Ammonia, September 2016 – June 2020

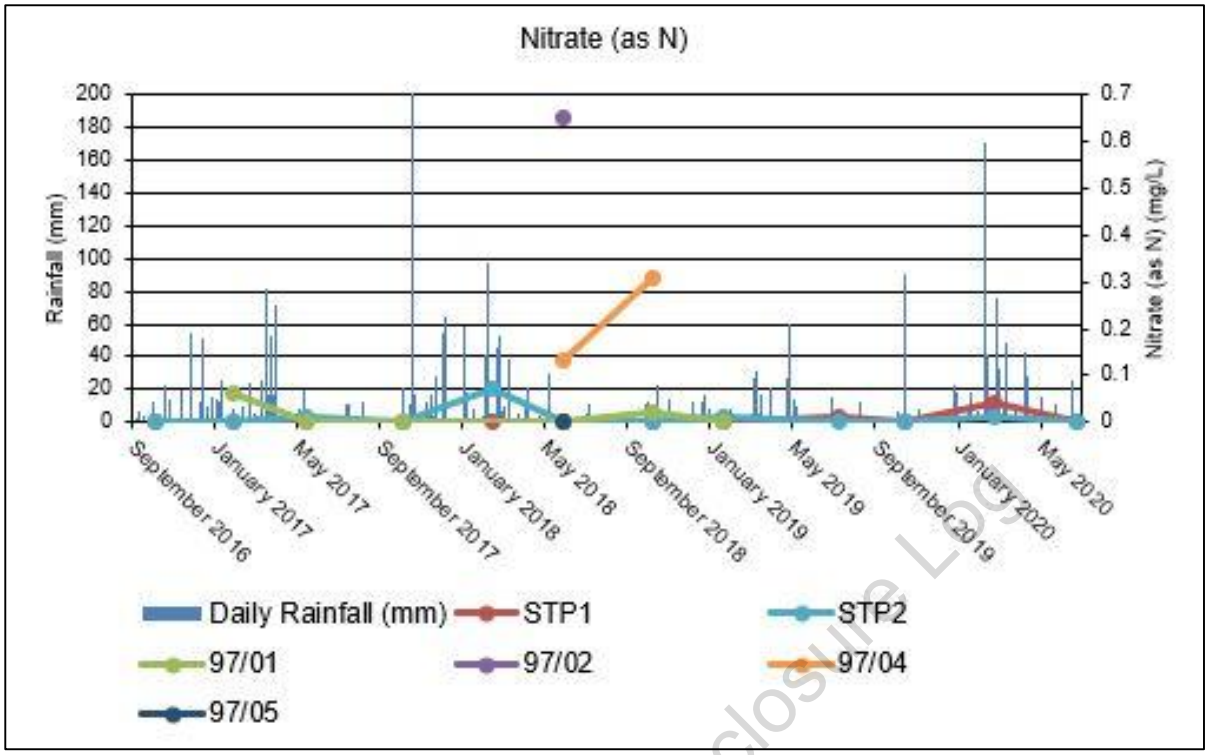

Figure 29 WwTP Nitrate, September 2016 – June 2020

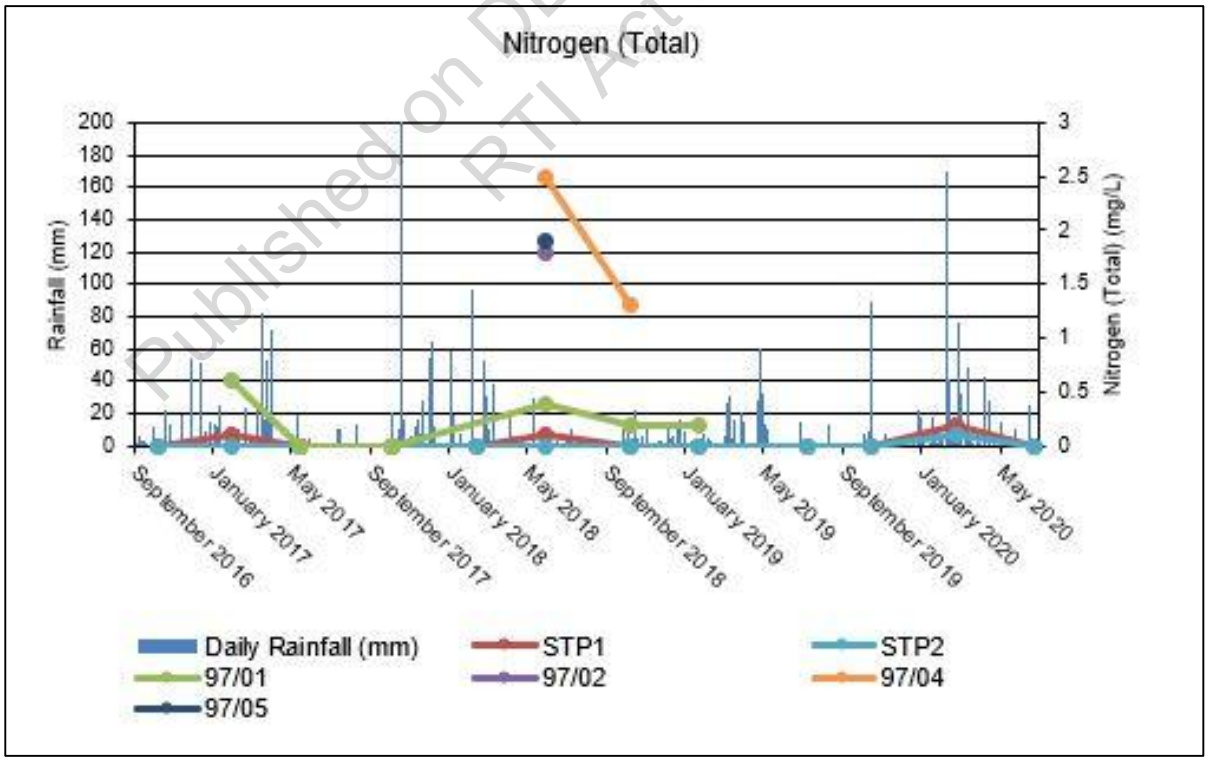

Figure 30 WwTP Total Nitrogen, September 2016 – June 2020

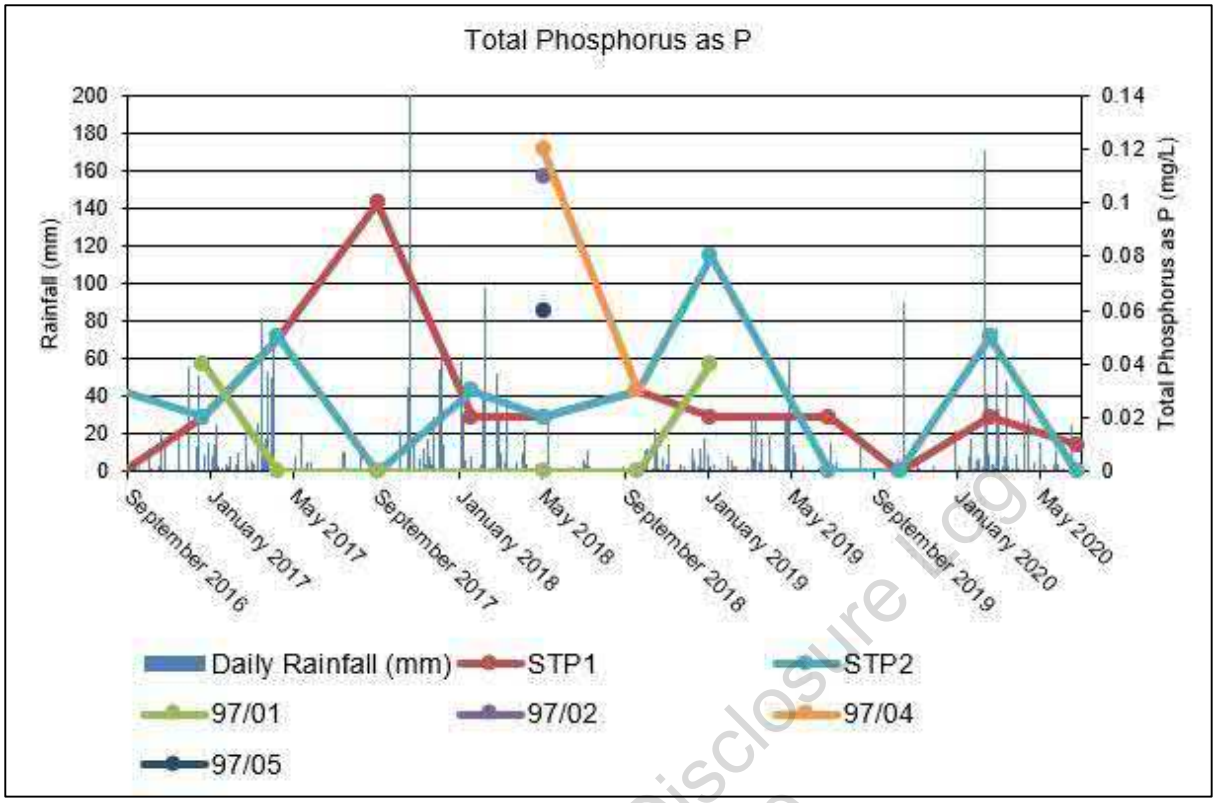

Figure 31 WwTP Total Phosphorus, September 2016 – June 2020

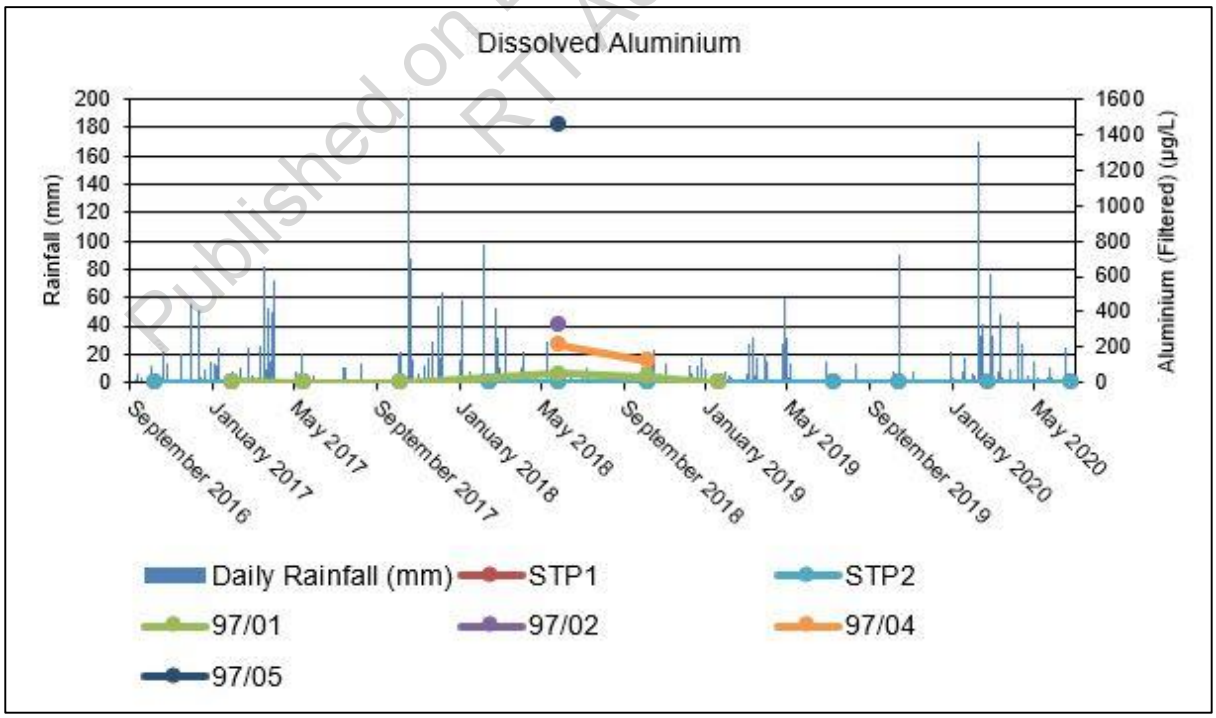

Figure 32 WwTP Dissolved Aluminium, September 2016 – June 2020

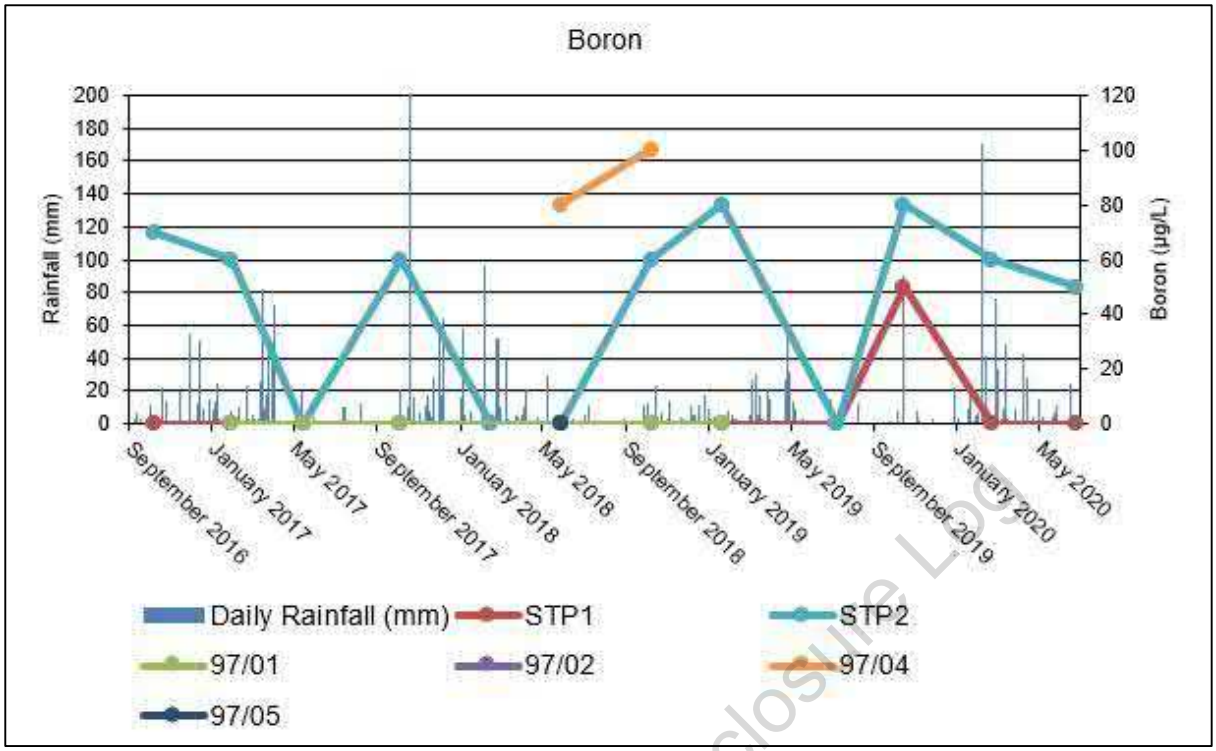

Figure 33 WwTP Total Boron, September 2016 – June 2020

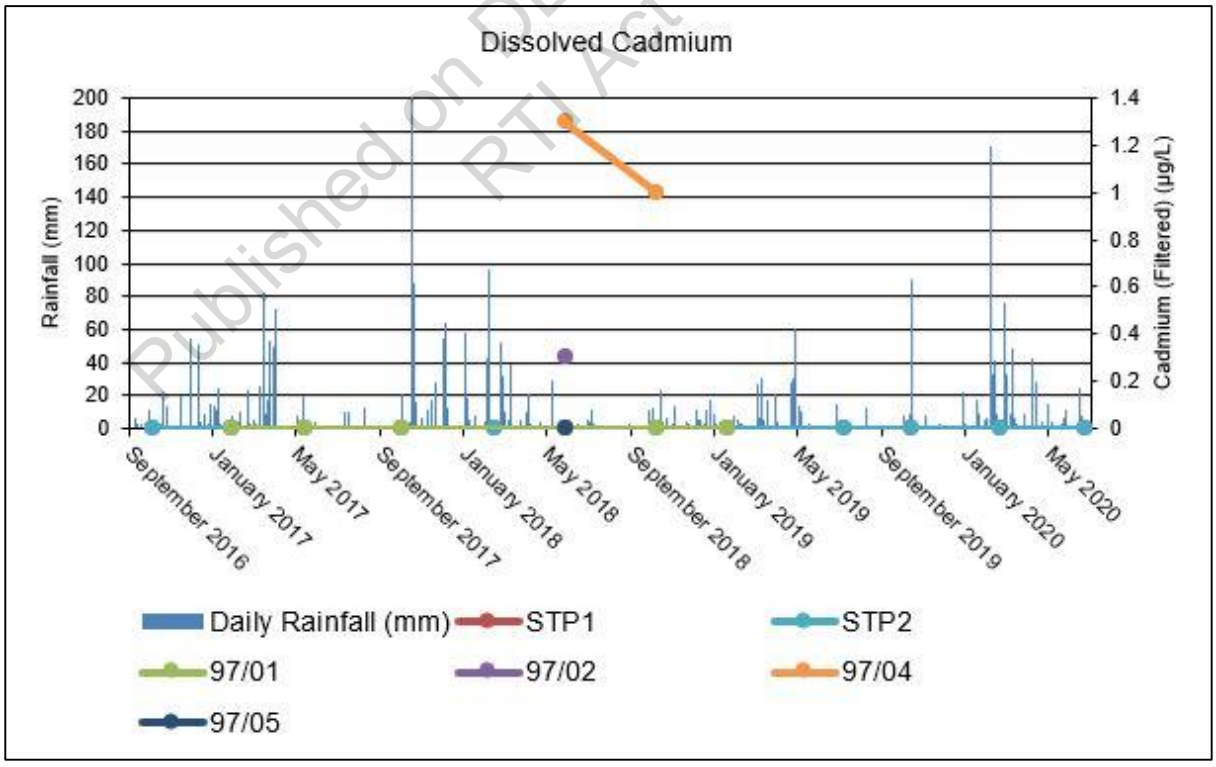

Figure 34 WwTP Dissolved Cadmium, September 2016 – June 2020

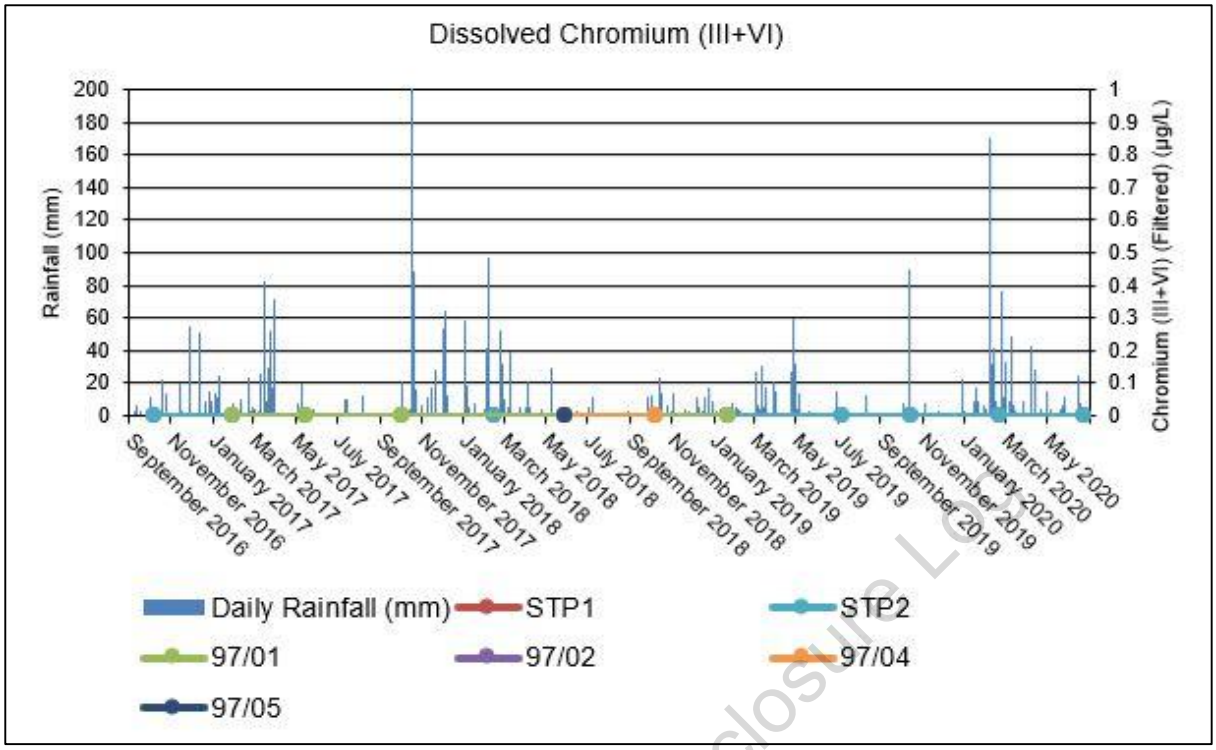

Figure 35 WwTP Dissolved Chromium, September 2016 – June 2020

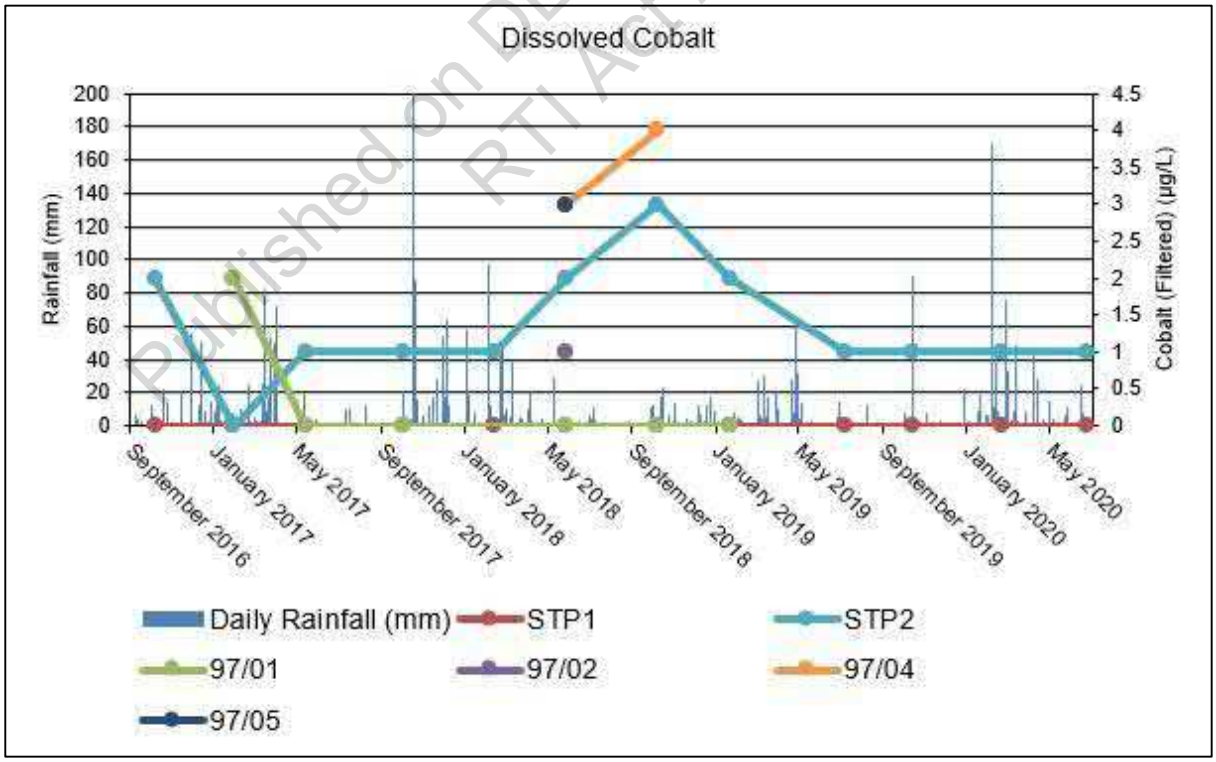

Figure 36 WwTP Dissolved Cobalt, September 2016 – June 2020

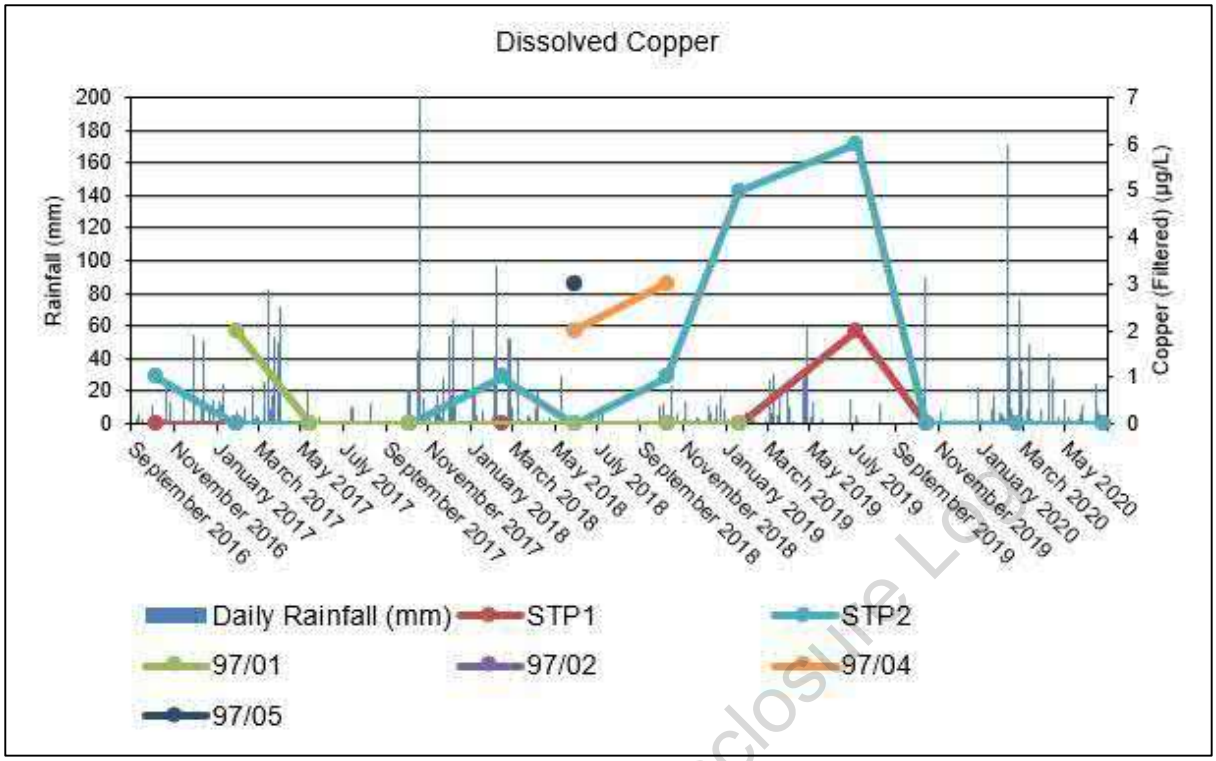

Figure 37 WwTP Dissolved Copper, September 2016 – June 2020

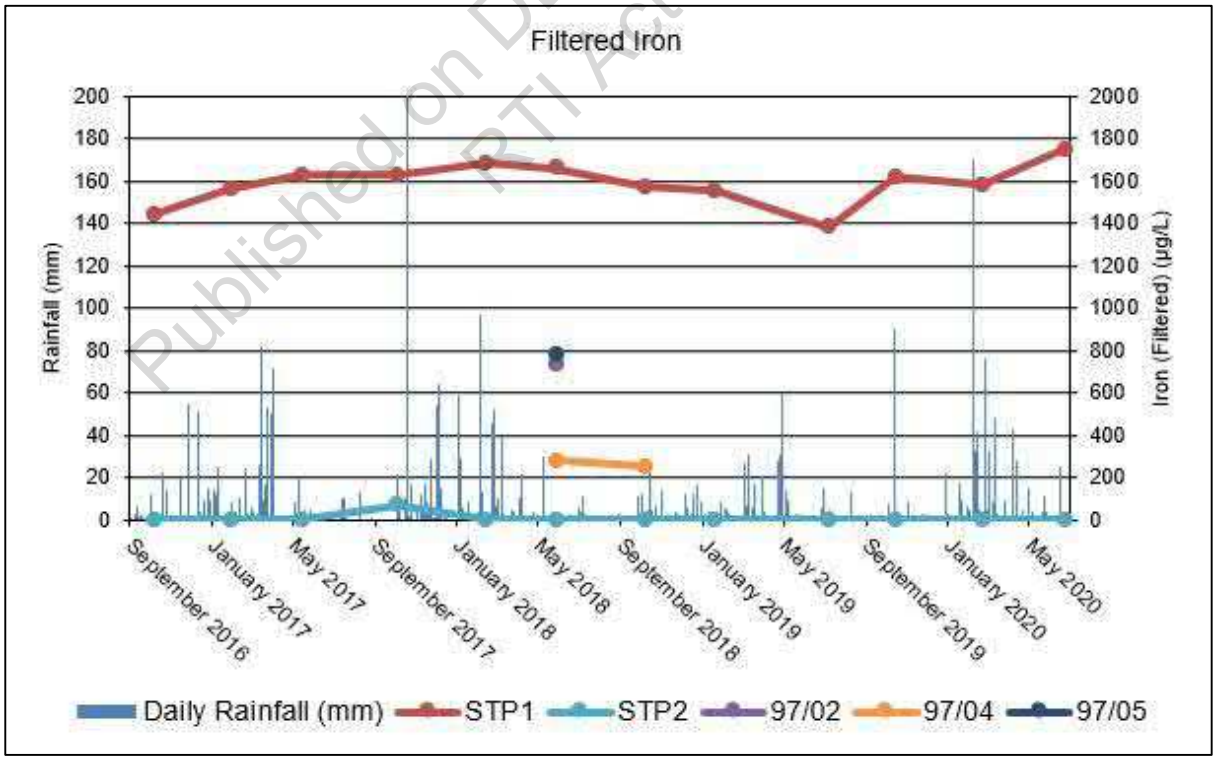

Figure 38 WwTP Filtered Iron, September 2016 – June 2020

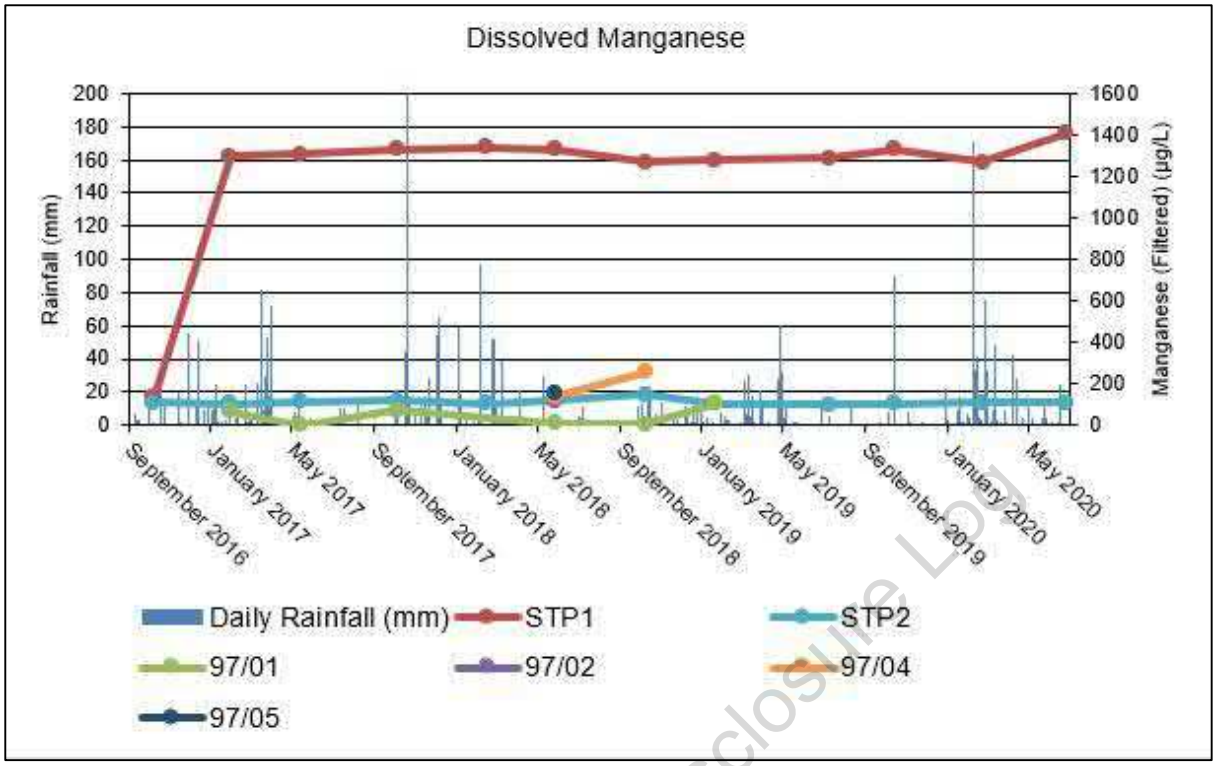

Figure 39 WwTP Dissolved Manganese, September 2016 – June 2020

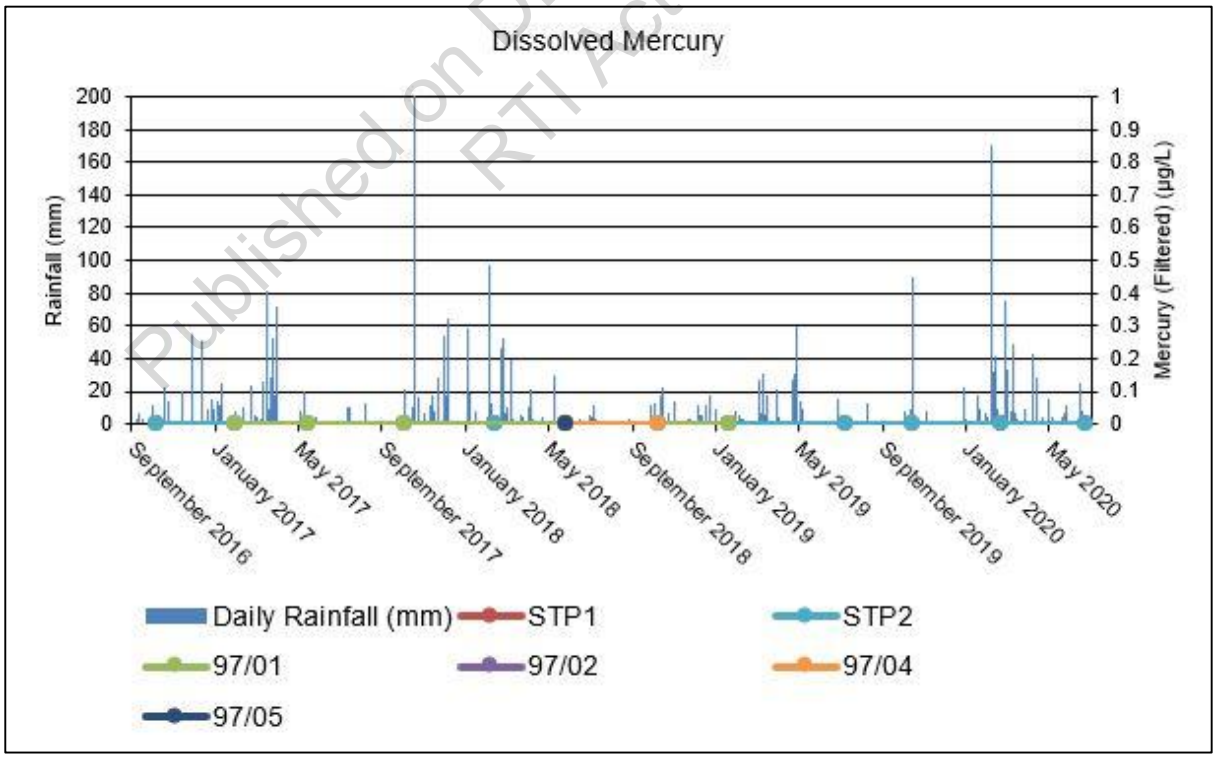

Figure 40 WwTP, Dissolved Mercury, September 2016 – June 2020

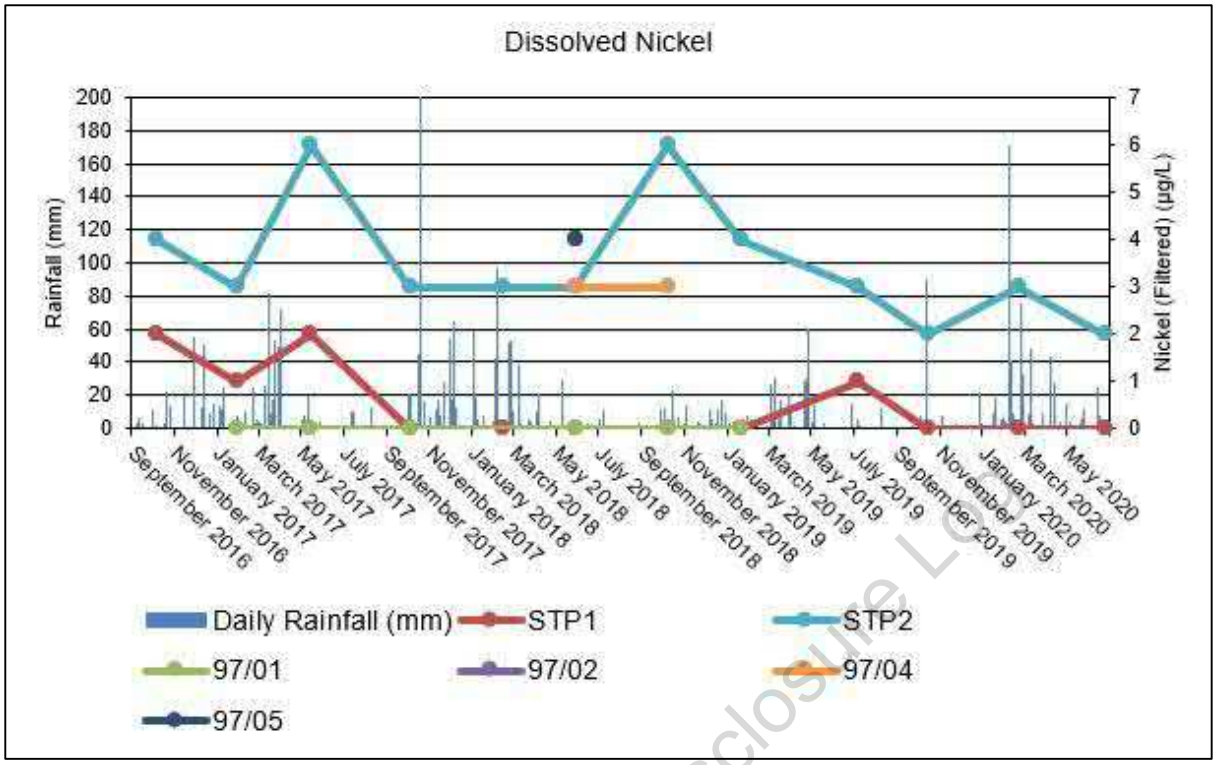

Figure 41 WwTP Dissolved Nickel, September 2016 – June 2020

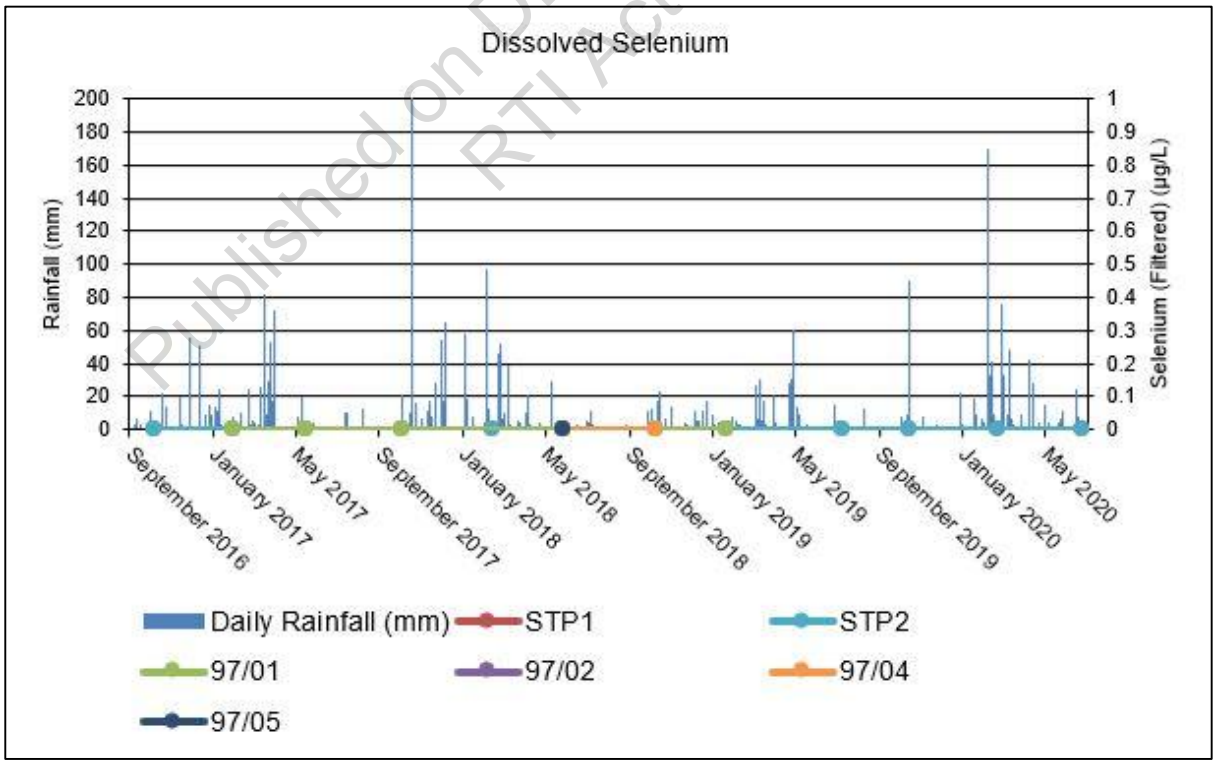

Figure 42 WwTP Dissolved Selenium, September 2016 – June 2020

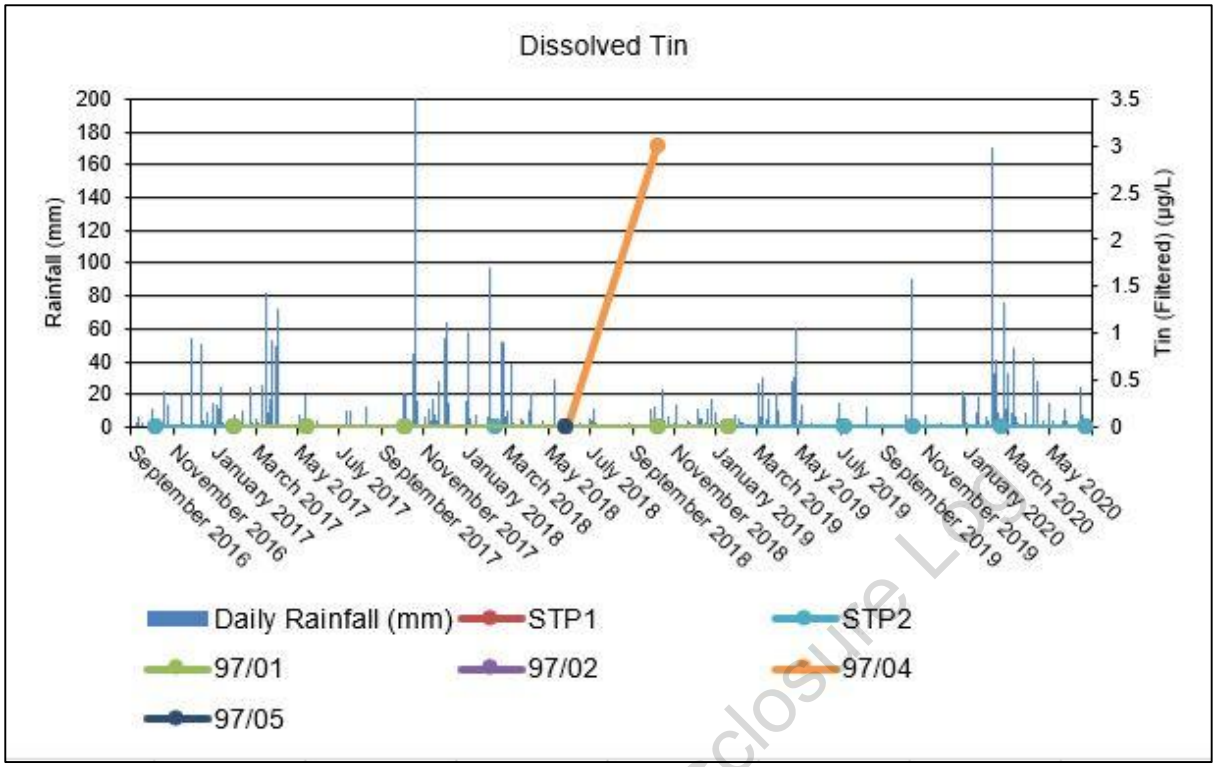

Figure 43 WwTP Dissolved Tin, September 2016 – June 2020

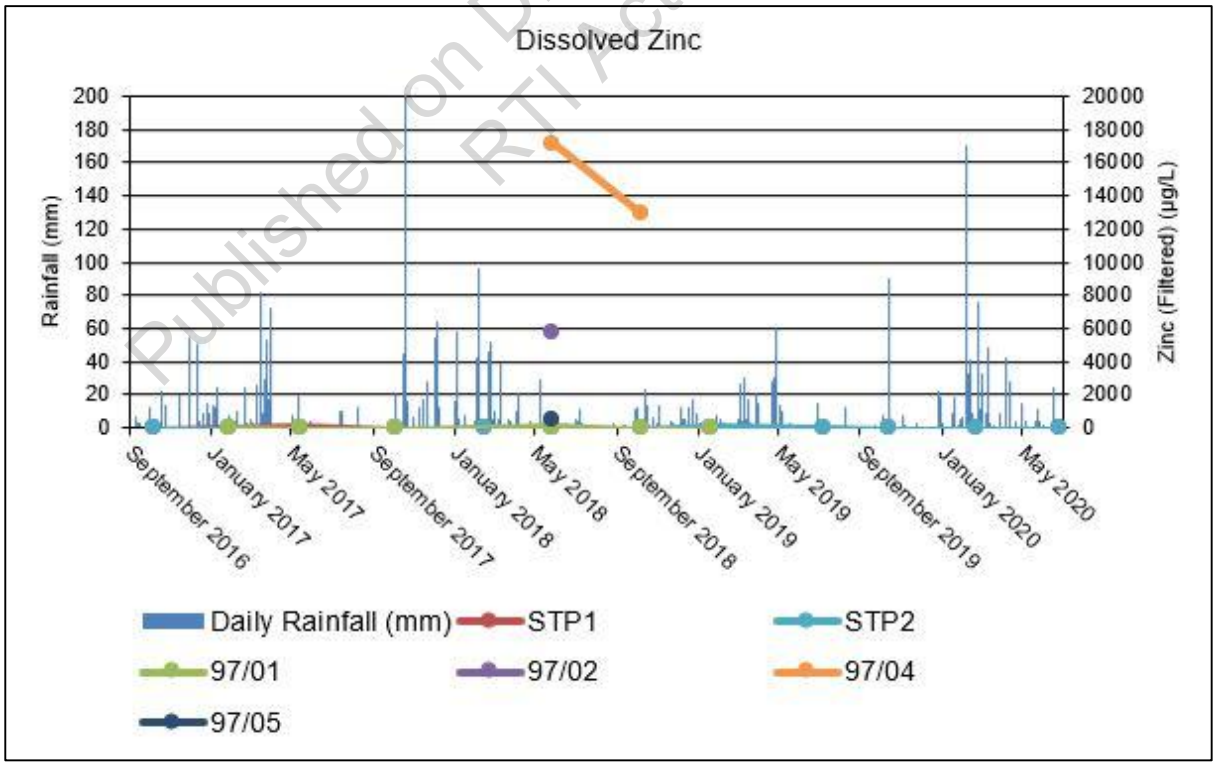

Figure 44 WwTP Dissolved Zinc, September 2016 – June 2020

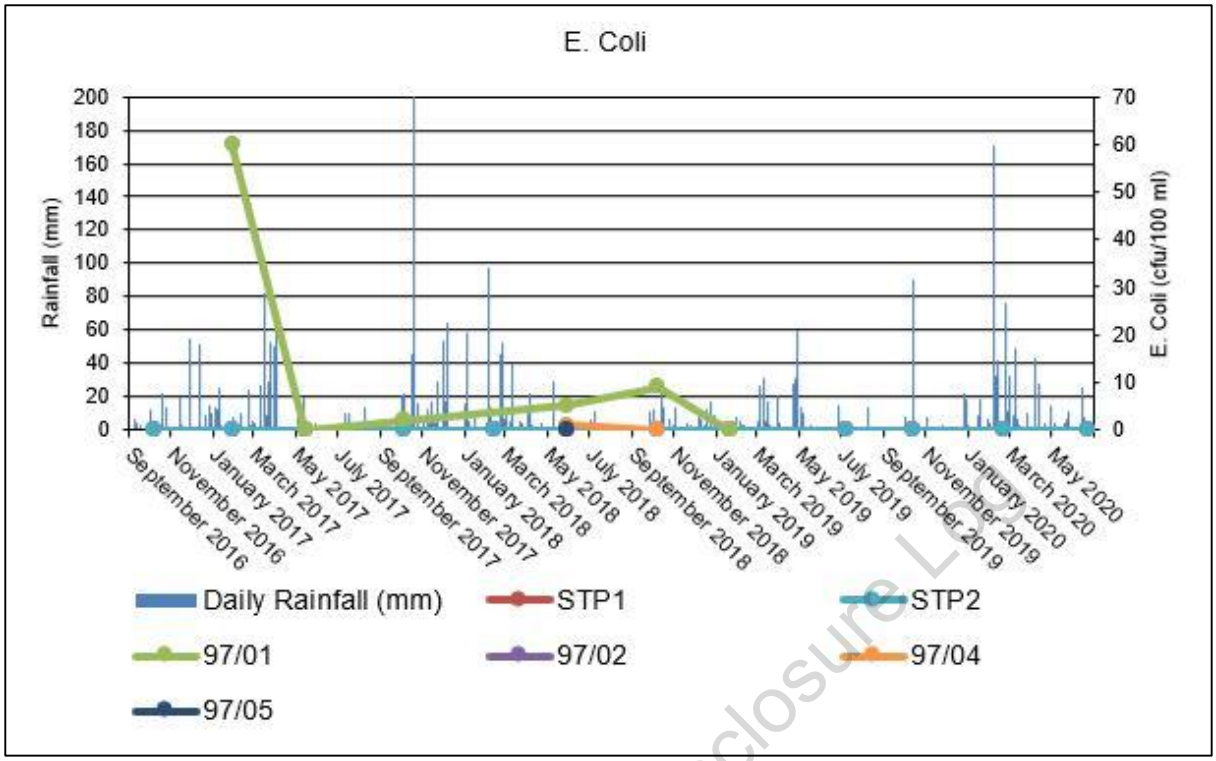

Figure 45 WwTP *E.Coli*, September 2016 – June 2020

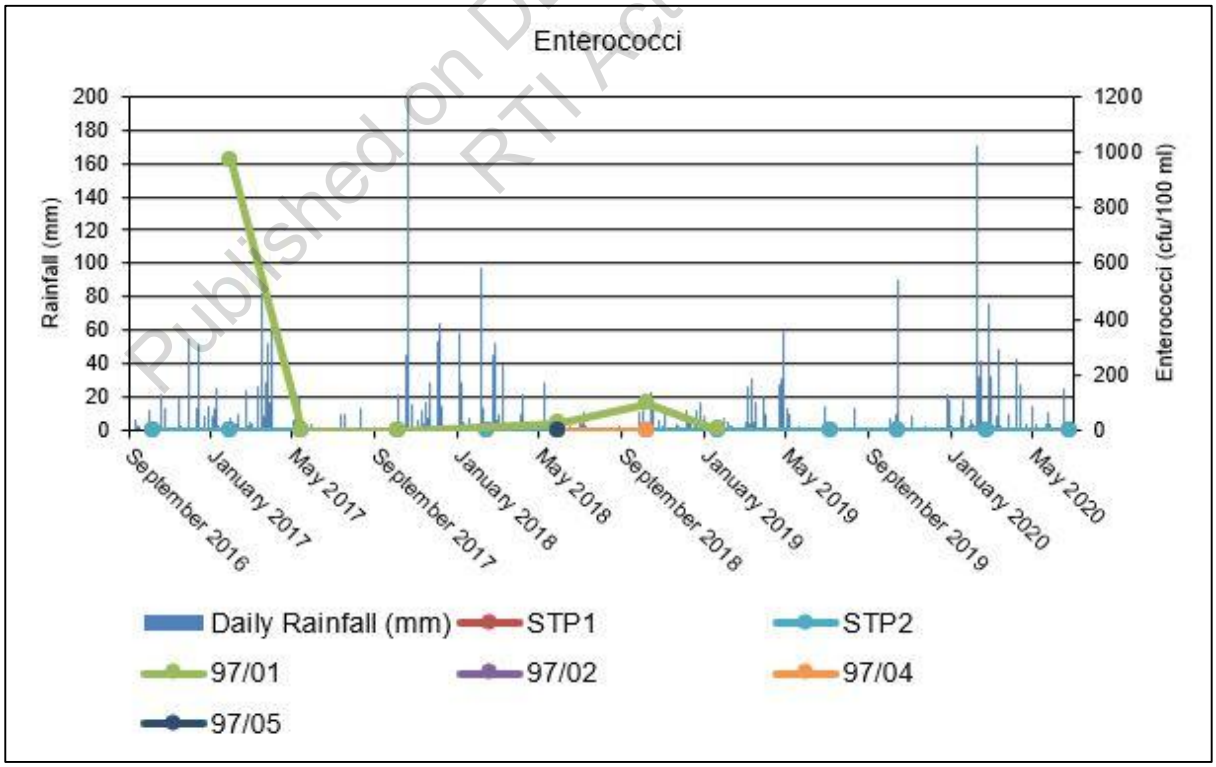

Figure 46 WwTP Enterococci, September 2016 – June 2020