

Silent Valley Waste Services Limited

Silent Valley Landfill

2022 Third Quarter Monitoring Report

Reference: 4-50

Issue 01 | 31 October 2022



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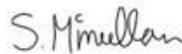
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1. Introduction

This 2022 Third Quarter Monitoring Report is a consolidated report detailing the findings of this quarter's results from the surface water, groundwater, landfill gas and leachate results for the monitoring undertaken in the period July to September 2022 in accordance with the Silent Valley Environmental Permit^[1] (Permit no. MP3835SV) and the Aftercare Phase Environmental and Infrastructure Monitoring Program^[6].

The data has been collected as referenced in Schedule 3 of the Consolidated Permit^[1]. This report refers to the 2022 Second Quarter Monitoring Report^[3] and the 2021 Annual Monitoring Report^[4].

1.1 Monitoring Regime

The monitoring regime is undertaken in accordance with the Aftercare Phase Environmental and Infrastructure Monitoring Program^[6] and in line with the Consolidated Permit^[1], which is fully detailed within the 2019 annual report^[2].

2. Discussion of Monitoring Results

2.1 Rainfall

Measured rainfall data is illustrated in **Appendix A1, Figures A1 to A3**.

Based on the available data, September recorded the highest monthly rainfall of the quarter (85.3mm) and the highest daily rainfall total (12.7mm on 30th September). September's monthly rainfall total has increased since September 2021. July recorded the lowest monthly rainfall of the quarter (23.8mm) and recorded 23 non consecutive days of no rain. Notably July and August 2022 were the driest summer months since records began in 2008.

2.2 Leachate

2.2.1 Leachate Quality Monitoring

Leachate quality monitoring results from within the waste body and from leachate standpipes are presented in **Appendix A2, Table B1**.

The monthly average well concentrations for the site remain compliant this quarter against the Acceptable Maximum Concentration (AMC). Most of the individual well concentrations remain compliant with exceptions identified below.

LC2A well continues to exceed the AMC for nickel (0.0681mg/l) with a concentration of 0.13mg/l, this has increased from the previous quarter (0.12mg/l). This exceedance has been recorded continuously throughout 2021 and 2022^[4].

LC2A well remains elevated above the AMC concentration for ammoniacal nitrogen recording 630mg/l, this concentration has increased from the last quarter. Historically ammoniacal nitrogen readings have been known to fluctuate in this well.

The ammoniacal nitrogen and nickel concentration exceedances were discussed in the LC2A Technical Note appended to the 2021 Annual Report ^[4].

In accordance with the Aftercare Phase Environmental and Infrastructure Monitoring Program report^[6], the contingency plan is to be implemented after three consecutive exceedances have been recorded.

The installation within LC5A has failed and works are ongoing to replace this well in the near future.

2.2.2 Leachate Level Monitoring

Leachate head level monitoring results are presented in **Appendix A2, Table B2**. The monthly average level for all the wells remains below the required 3.0m, as per the Permit^[1].

2.3 Surface Water

The surface water quality monitoring results are presented in **Appendix A2, Table B3**, and graphically in **Appendix A1, Figure A4**.

Commentaries are provided for upstream and downstream monitoring points in the Nant Merddog, including locations SW1 to SW10 located downstream of the landfill, as discussed below.

A number of surface water samples are exceeding the EQS for ammoniacal nitrogen. However it should be noted that since a change of laboratory there has been a number of ongoing issues with quality control and inaccurate results, and as a consequence we do not feel it appropriate to rely on these results at this time and an investigation is ongoing as to whether this is a lab error, or an issue with the landfill.

2.3.1 Upstream Surface Water

Surface water monitoring locations, SWU, SW2A1, SWW4, SWW1 and SWW2 are located downstream of the landfill and monitored on a six-monthly basis in accordance with the Permit requirements. They are not monitored this quarter.

2.3.2 Downstream Surface Water

SWD and SWD1

Results show both SWD and SWD1 are compliant with the exception of unionised ammoniacal nitrogen recording exceedances of 0.0871mg/l in SWD and 0.1573 mg/l in SWD1. Unionised ammoniacal nitrogen has increased from previous exceedances last quarter.

2.4 Groundwater

2.4.1 Groundwater Quality Monitoring

Groundwater quality monitoring results are presented in **Appendix A1, Figures A5 and A6** and in **Appendix A2, Table B4**.

Any non-compliances for both upstream and downstream wells are discussed in the following sections.

A number of groundwater samples are exceeding the trigger and control levels for ammoniacal nitrogen. It is noted that chemical testing is now being undertaken by a different laboratory, an investigation is ongoing as to whether this is a lab error, or an issue with the landfill.

2.4.1.1 Upstream Groundwater Wells

Well GW3A and GW4

GW3A and GW4 monitor the sandstone strata classified as S3-East, and GW11B are installed in the sandstone strata classified as S2-West.

Manganese continues to exceed assessment levels in GW4 with continued fluctuations over the years whilst showing no recognisable trend. Manganese has exceeded assessment level again this quarter. These elevated concentrations recorded upstream are likely to be from steel works waste deposited to the north of the landfill and old mine workings in the area. Manganese is a typical contaminant of mine drainage, which is impacting the groundwater in the locale of the landfill.

Ammoniacal nitrogen levels continue to be recorded above the trigger level (of 1mg/l) in GW3A with concentrations of 5.9mg/l and has exceeded over the past two quarters. Ammoniacal nitrogen has remained compliant for this first time in 2022 within GW4.

2.4.1.2 Downstream Groundwater Wells

The results from the compliance wells indicate that generally the pumping system at the toe of the landfill is continuing to successfully control the potential egress of leachate from the landfill. No issues associated with pump failure within the cut-off system were recorded during 2021 and 2022.

Well GW10

GW10 is installed in the sandstone strata classified as S3-East.

GW10 has exceeded the assessment level (of 1.0mg/l) with a manganese concentration of 4.0mg/l. This is a decrease from the previous quarter. Historically manganese has been known to fluctuate, this was evident throughout 2021.

Well GW9

GW9 is installed in the sandstone strata classified as S2-East.

GW9 continues to be non-compliant for Ammoniacal Nitrogen in relation to the trigger level with a concentration of 3.7mg/l. The concentrations of ammoniacal nitrogen have been exceeding the trigger level since the first quarter of 2021, but this contaminant has been shown to fluctuate. Ammoniacal nitrogen continues to decrease from the previous two quarters.

Well GW12

GW12 is installed in the sandstone strata classified as S2-West.

Sulphate concentrations have exceeded the control level of 300mg/l recording a concentration of 310mg/l. These concentrations have generally been increasing since April 2021 but remained compliant. Sulphate has now exceeded control levels for two consecutive months and will be monitored closely next quarter.

Wells GW6 and GW7

GW6 and GW7 have been installed in the centre of the valley in the sandstone strata classified as S1.

GW6 and GW7 are both compliant this quarter. Both GW6 and GW7 remained compliant for ammoniacal nitrogen for two quarters. Manganese remains below the assessment level in GW7 and zinc also remains compliant this quarter.

2.4.2 Groundwater Levels Monitoring

Groundwater levels are monitored on a quarterly basis in the compliance and upstream wells. The monitoring results are illustrated graphically in **Appendix A1, Figure A7**. Water levels have remained relatively consistent this quarter with no significant differences from the 2021 readings^[4].

2.5 Landfill Gas

2.5.1 Methane

The landfill gas monitoring results are presented in **Appendix A2, Table B5**.

Methane concentrations continue to be recorded below the respective control and trigger levels (where available) in all monitoring locations.

2.5.2 Carbon Dioxide

The following wells remained compliant this quarter including GMW1, GMW3, GMW8, GMW9, GMW10, GMW12, GMW17 and GMW18.

There were several exceedances throughout this quarter of both control and trigger levels including:

- GMW2 Red Valve exceeded the trigger level (1.5%) in July (2.3%) and August (1.6%). GMW2 Red Valve exceeded the control level (1%) in September (1.3%). These exceedances began last quarter in June, but concentrations have started to decrease.
- GMW4 Red Valve exceeded the trigger level (1.5%) in July (1.6%) This is the first exceedance of 2022.
- GMW5 Yellow Valve exceeded the trigger level (4.1%) in July (5.1%) and August (4.3%) but was compliant in September.
- GMW6 Red Valve exceeded the trigger level (4.3%) in July (5.3%), August (5.6%) and September (6.7%). These concentrations have increased since the previous quarter and will be monitored closely.
- GMW7 Yellow Valve exceeded the trigger level (1.8%) in July (2.2%) and the White Valve exceeded the trigger level (1.83%) in July (2.2%). These are the first exceedances of 2022 but the valves are compliant in August and September. This was a potential anomaly.
- GMW13 Yellow Valve exceeded the trigger level (6%) in July (2.2%) and the control level (5.5%) in August (5.6%). These are the first exceedances of 2022, but the valve was compliant in September.

- GMW14/14A consecutive concentration exceedances and fluctuations were recorded in 2020 and 2021. This has continued in 2022 and this quarter;
 - Red Valve July (3.2%), August (2.5%) and September (4.2%) exceeding trigger level of 1.5%.
 - Yellow Valve August (6.0%) and September (8.0%) exceeding trigger level of 5.9%
 - White Valve September (5.4%) exceeding trigger level of 5.4%.

The GMW14/14A concentration exceedances were discussed in the GMW14/14A Technical Note appended to the 2021 Annual report [4].

3. Conclusion

The monitoring data and interpretation produced in this report has not identified any significant issues relating to contaminant levels recorded above the screening criteria within the leachate and groundwater. Where limited minor exceedances have been identified there is no evidence to suggest they are having a discernible impact on the surrounding environment and the landfill continues to comply with the requirements of the permit.

The third quarterly report noted the following:

- LC2A individually continues to exceed the Acceptable Maximum Concentration (AMC) for ammoniacal nitrogen and nickel, however, the averaged leachate wells are compliant against the AMC. It has been concluded in the LC2A Technical Note appended to the 2021 Annual report ^[4] that there is no significant threat to the environment with this well's exceedance.
- GW12 has exceeded the sulphate control level for two consecutive months. This will be monitored closely next quarter to identify any possible trends.
- Several groundwater and surface water samples are exceeding the permit concentrations for ammoniacal nitrogen. An investigation is ongoing to whether this is a lab error (due to recent change in laboratory), or an issue with the landfill.
- GMW2 continues to record elevated carbon dioxide concentrations this quarter but concentrations are decreasing, this will be monitored closely next quarter.
- GMW6 continues to record elevated carbon dioxide concentrations this quarter. These concentrations are fluctuating above and below the control levels and this well will be reviewed again next quarter.
- GMW14/14A continues to exceed the Trigger Levels for carbon dioxide concentrations, this was discussed within the 2021 GMW14/14A Technical Note appended to the 2021 Annual Report ^[4]. The optional recommendations to close out this issue are to be discussed with the regulators and further future investigation agreed, if necessary.

References

- [1] Environment Agency, Silent Valley Landfill Site, Pollution Prevention and Control (England and Wales) Regulations 2000, Landfill (England and Wales) Regulations 2002, Permit number MP3835SV, November 2005, Permit amended as of 04/03/16.
- [2] Arup, Silent Valley Landfill, 2019 Annual Monitoring Report, 31st January 2020.
- [3] Arup, Silent Valley Landfill, 2022 Second Quarter Monitoring Report, Issue July 29th, 2022.
- [4] Arup, Silent Valley Landfill, 2021 Annual Monitoring Report, 30th January 2022.
- [5] Arup, Silent Valley Landfill, Interim GW9 and Nant Merddog W, Issue May 2015.
- [6] Arup, Silent Valley Landfill, Aftercare Phase Environmental and Infrastructure Monitoring Program, Issue June 2013.
- [7] Arup, Silent Valley Landfill, Hydrogeological Risk Assessment, document reference 04/6363, November 2004.
- [8] Arup, Silent Valley Landfill, Investigation into the Western Flank of the Cut-off System. Compliance Well GW9 and GW10, document reference 115825, August 2011.
- [9] Environment Agency, Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water, report reference LFTGN02, June 2014.
- [10] Arup, Silent Valley Landfill, Hydrogeological Risk Assessment (Supplementary Revision May 2009), document reference 09/7543, June 2009.
- [11] Environment Agency, Guidance on the management of landfill gas, document reference LFTGN03, June 2014.
- [12] The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.
- [13] Water Framework Directive - United Kingdom Technical Advisory Group (WFD-UKTAG), "Metal Bioavailability Assessment Tool (M-BAT)," 2014.
- [14] Arup, Silent Valley Landfill, Hydrogeological Risk assessment, document reference 2019/9559, July 2019.

A.1 Monitoring Results - Graphs

Figure A1
Daily rainfall totals and sampling events (June 2015 - September 2022)

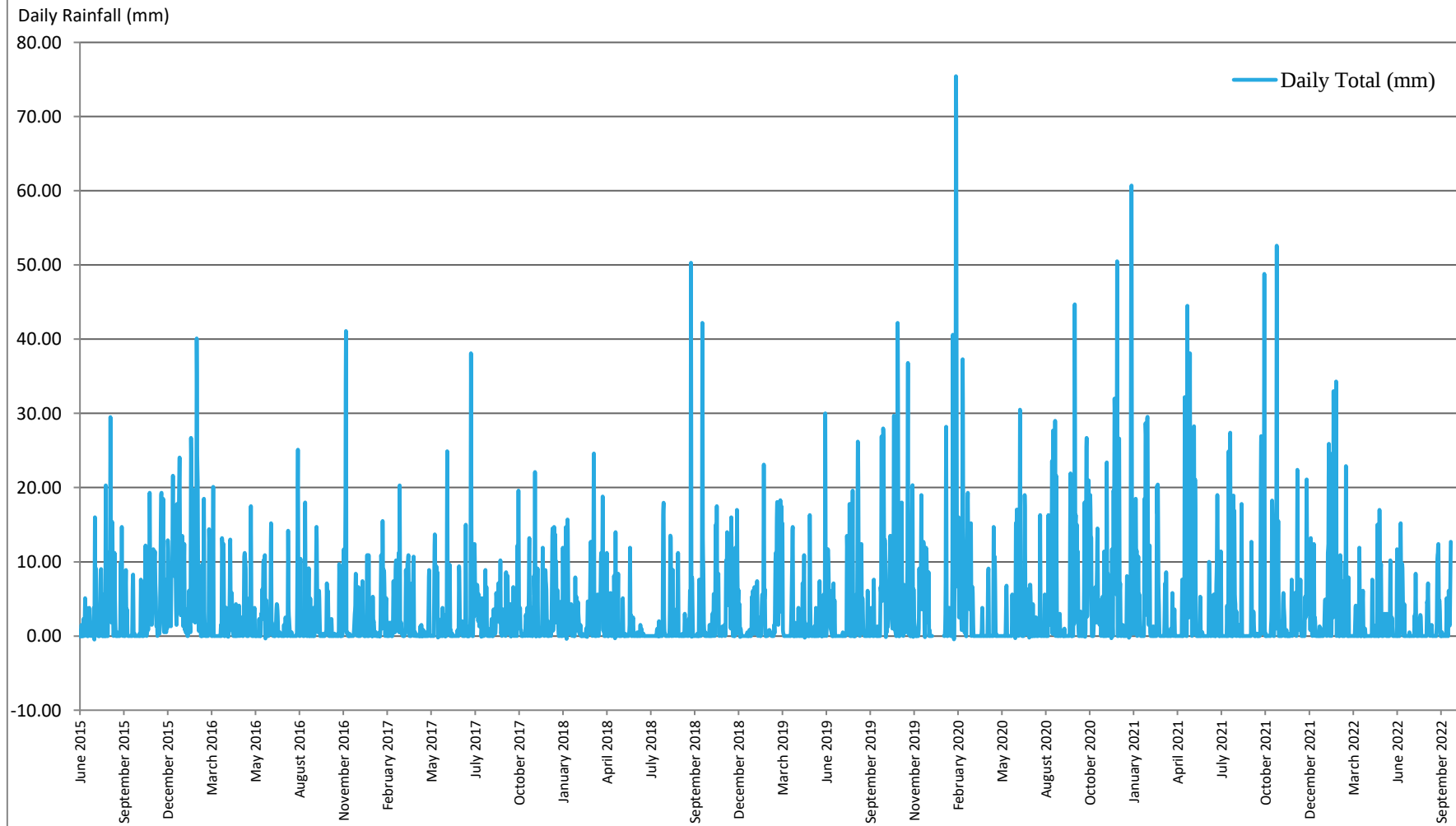


Figure A2
Monthly rainfall totals (June 2015 - September 2022)

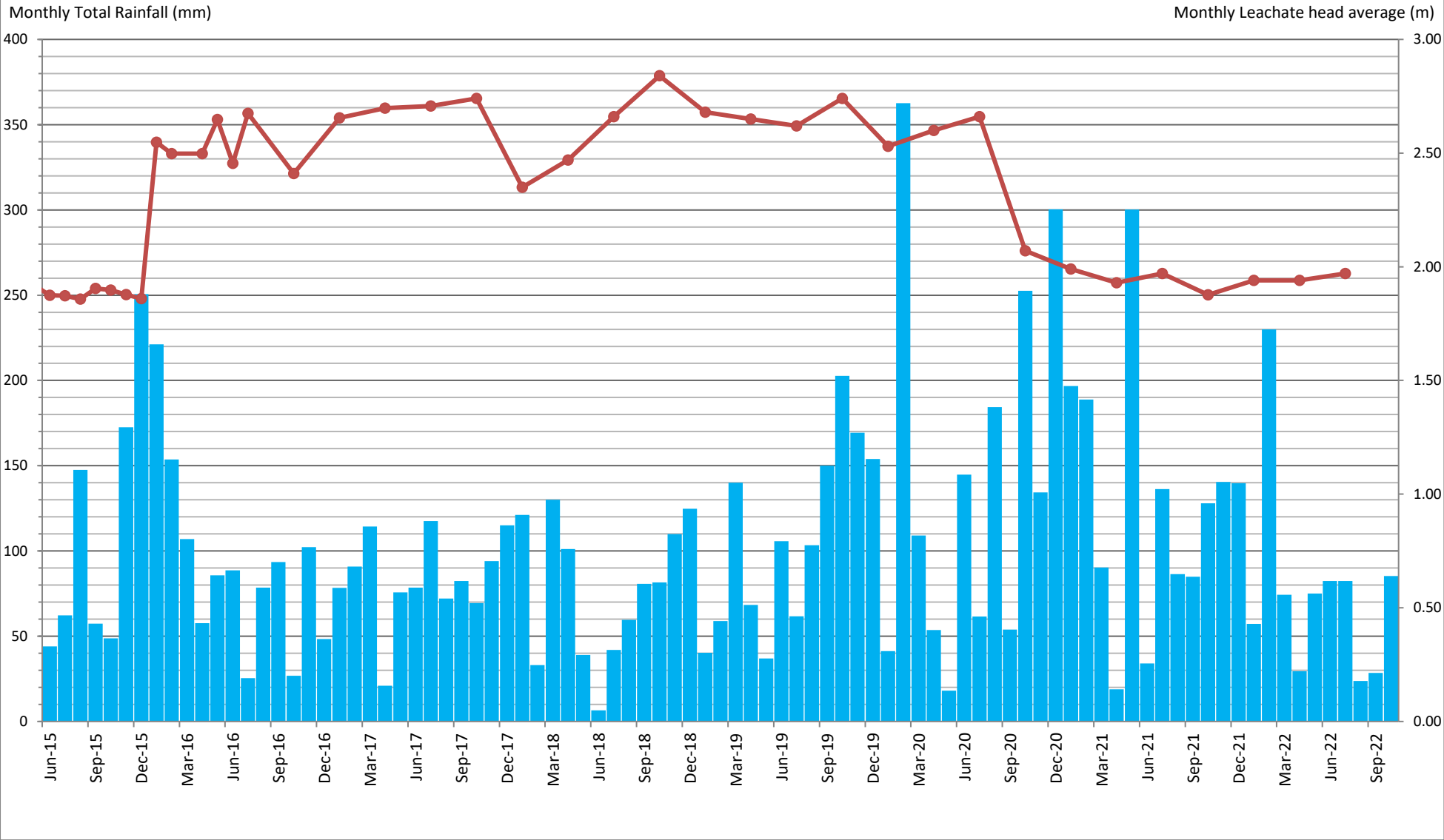


Figure A3
Monthly total rainfall (June 2015- September 2022)

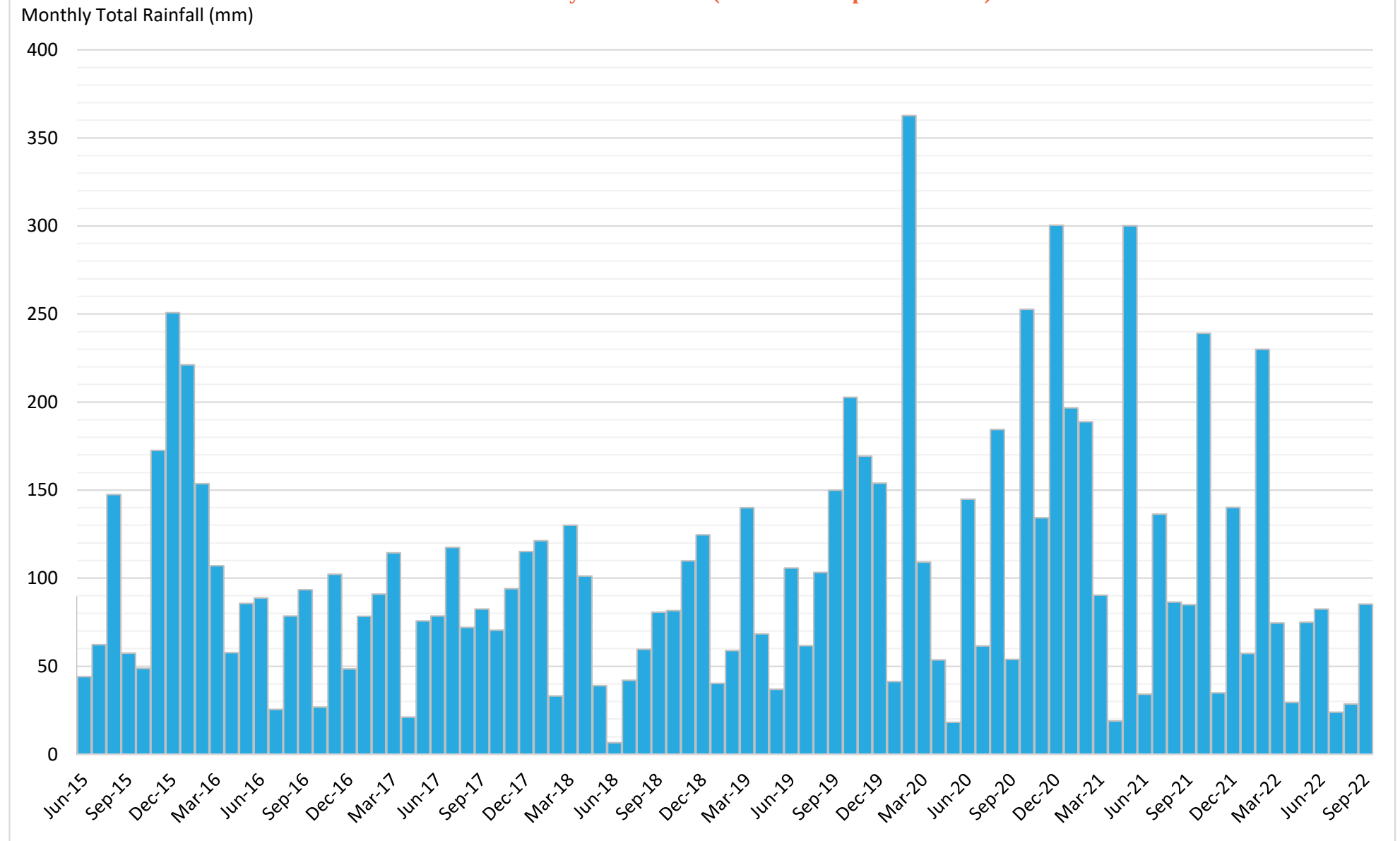


Figure A4

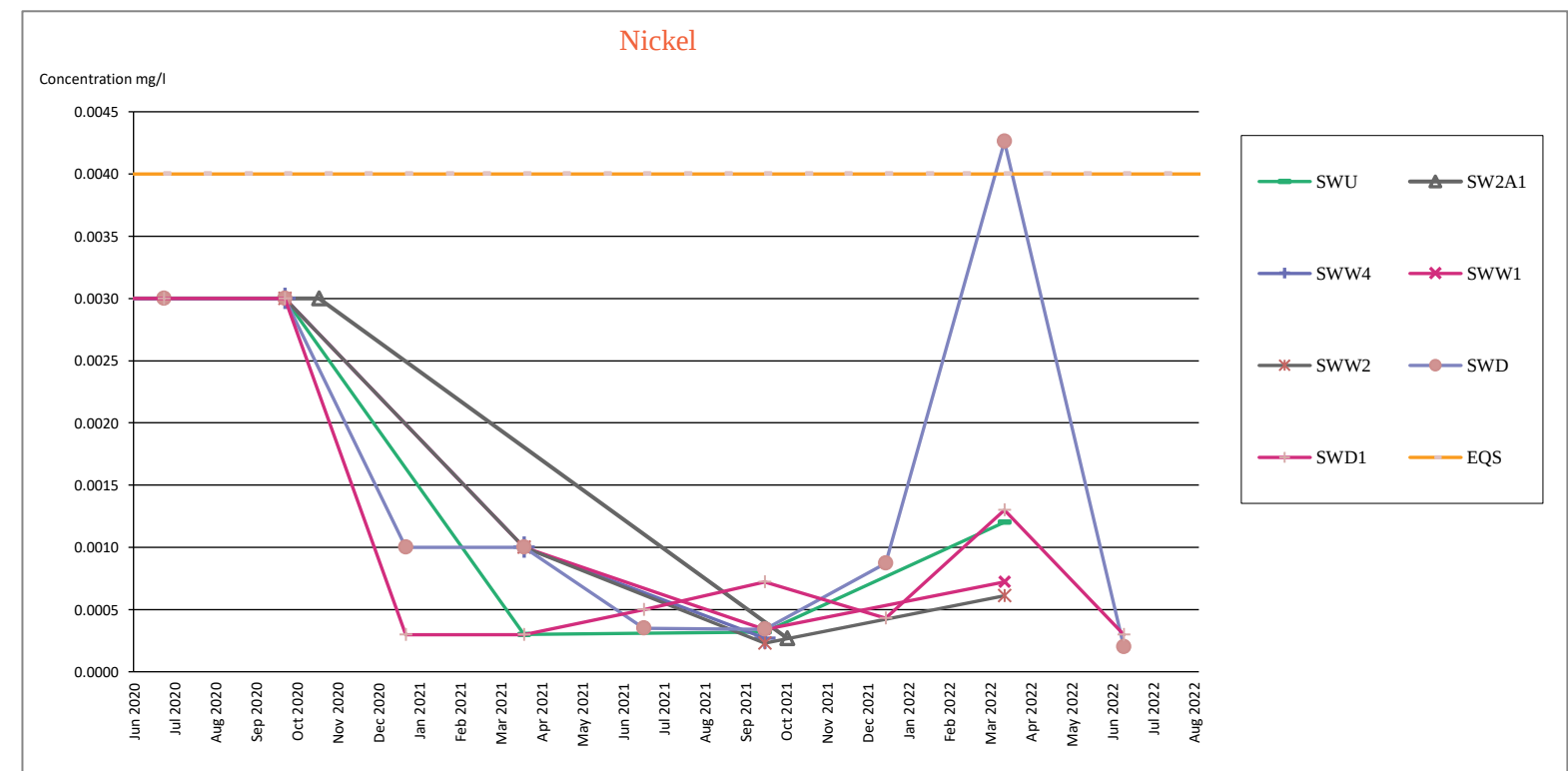
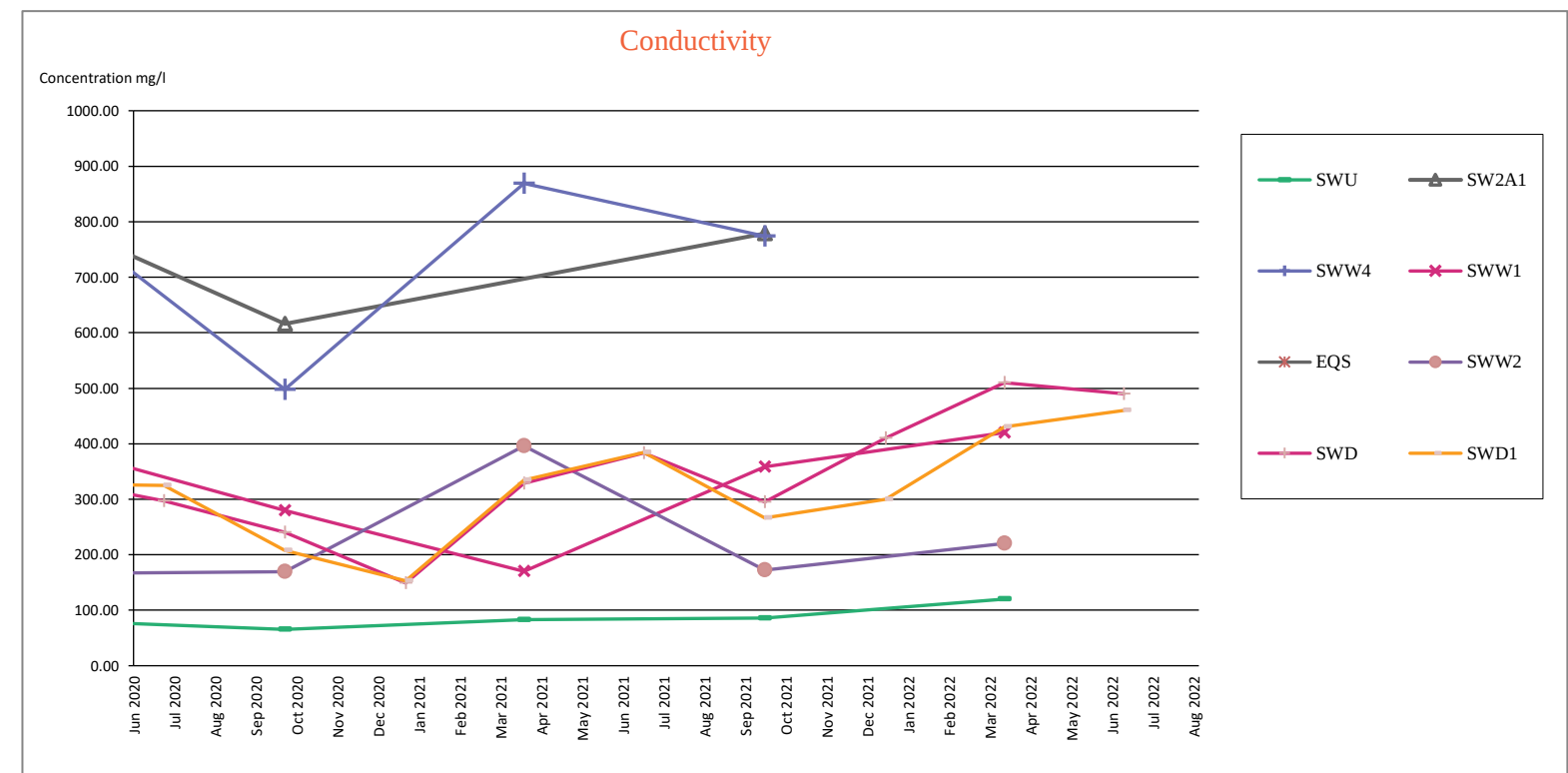


Figure A4
Surface water monitoring graphs

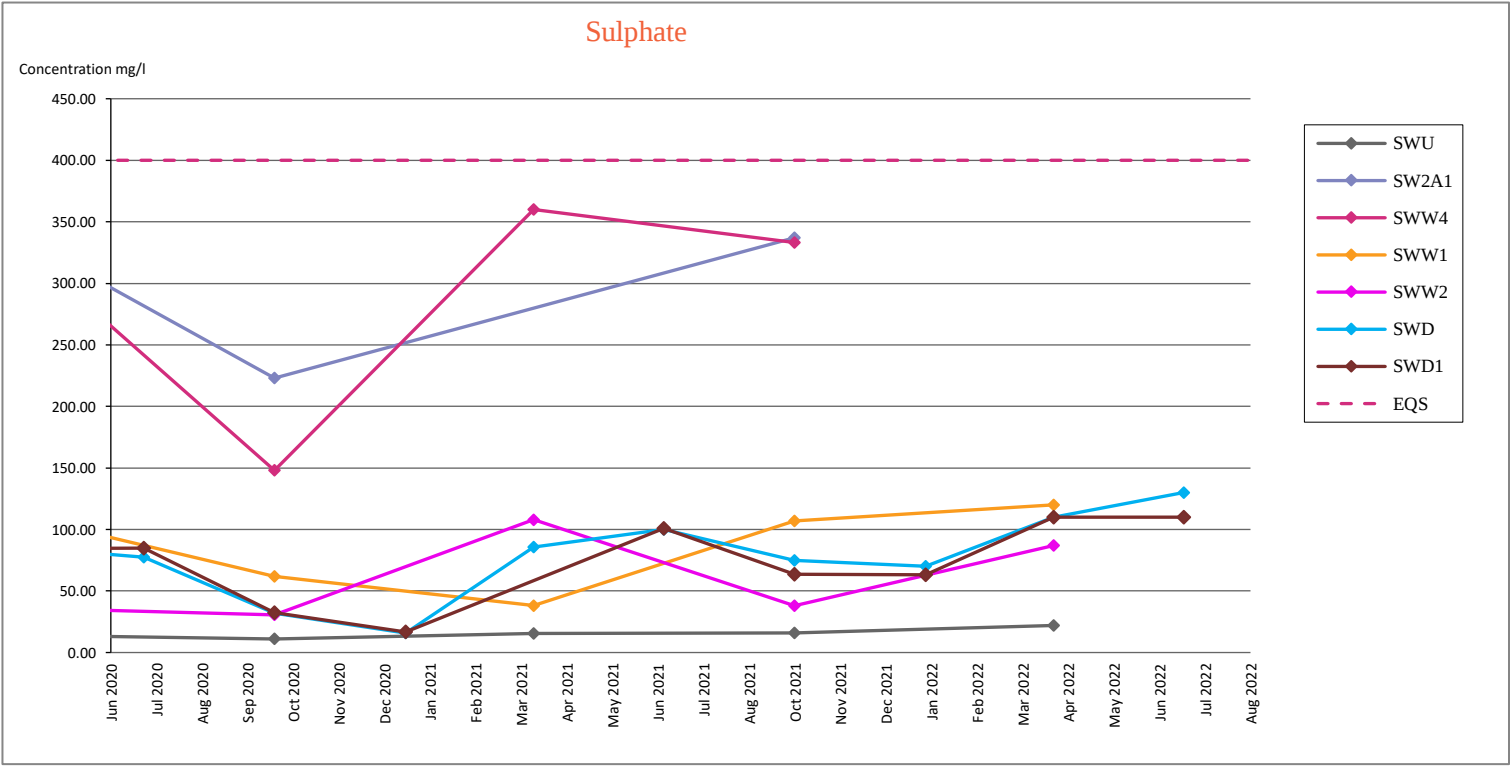
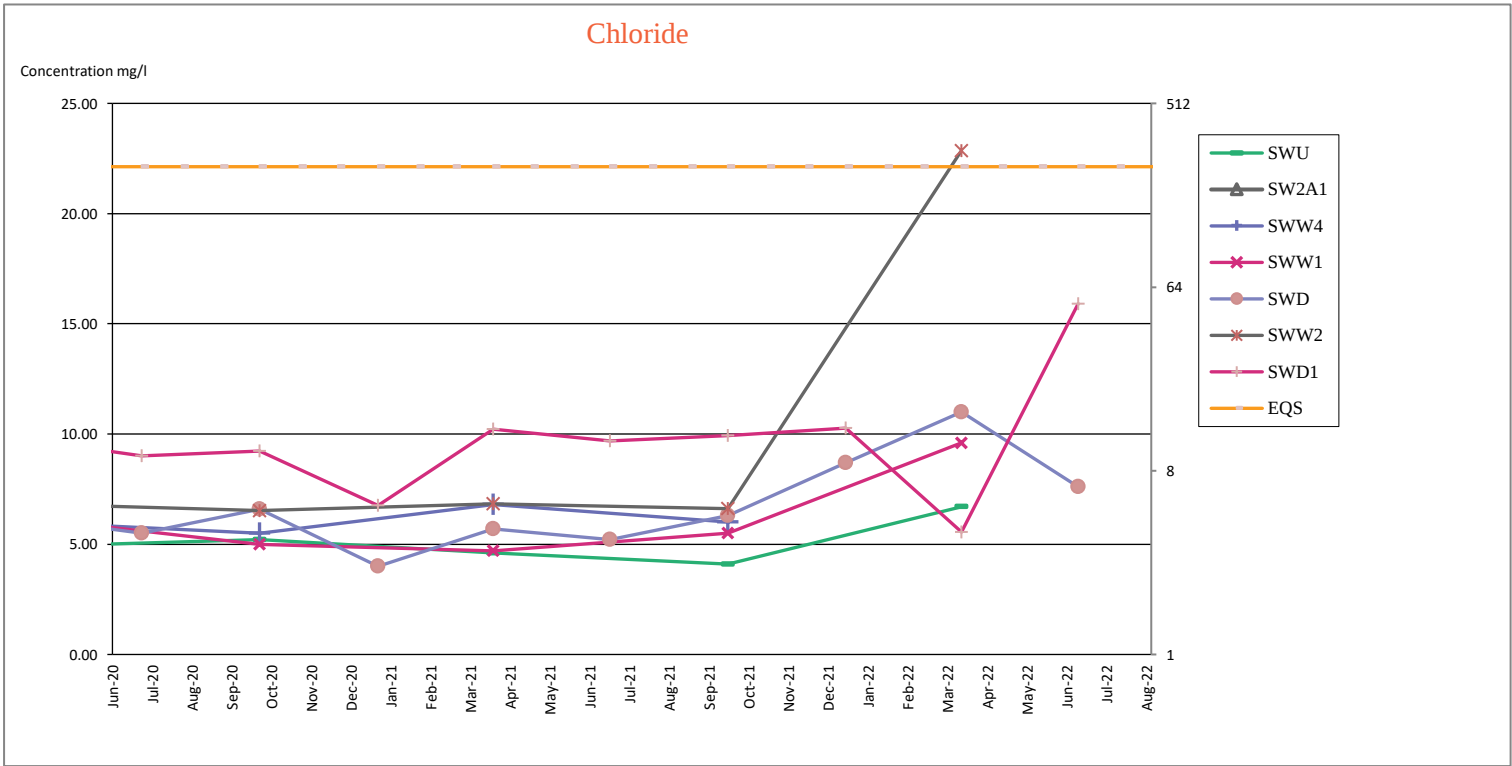
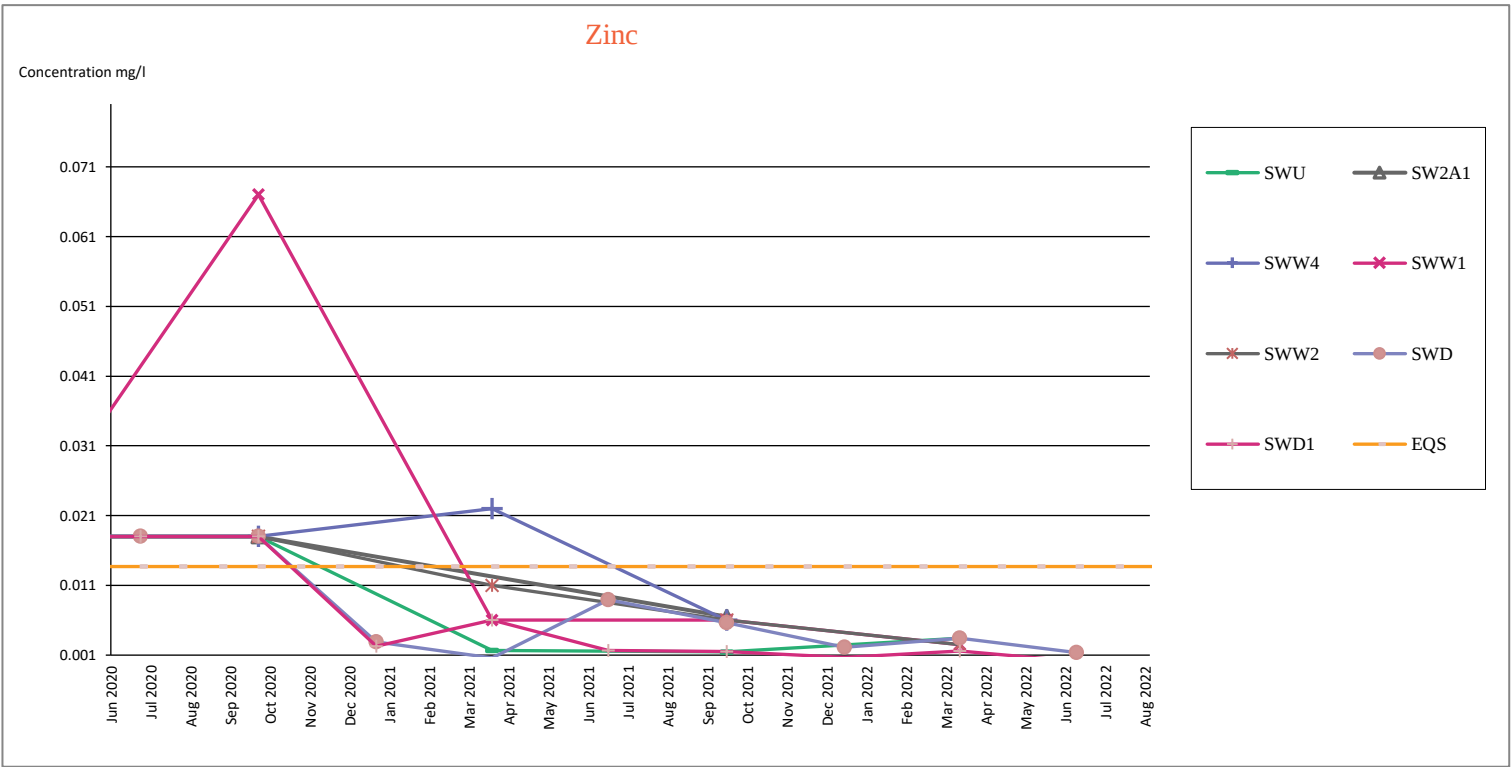
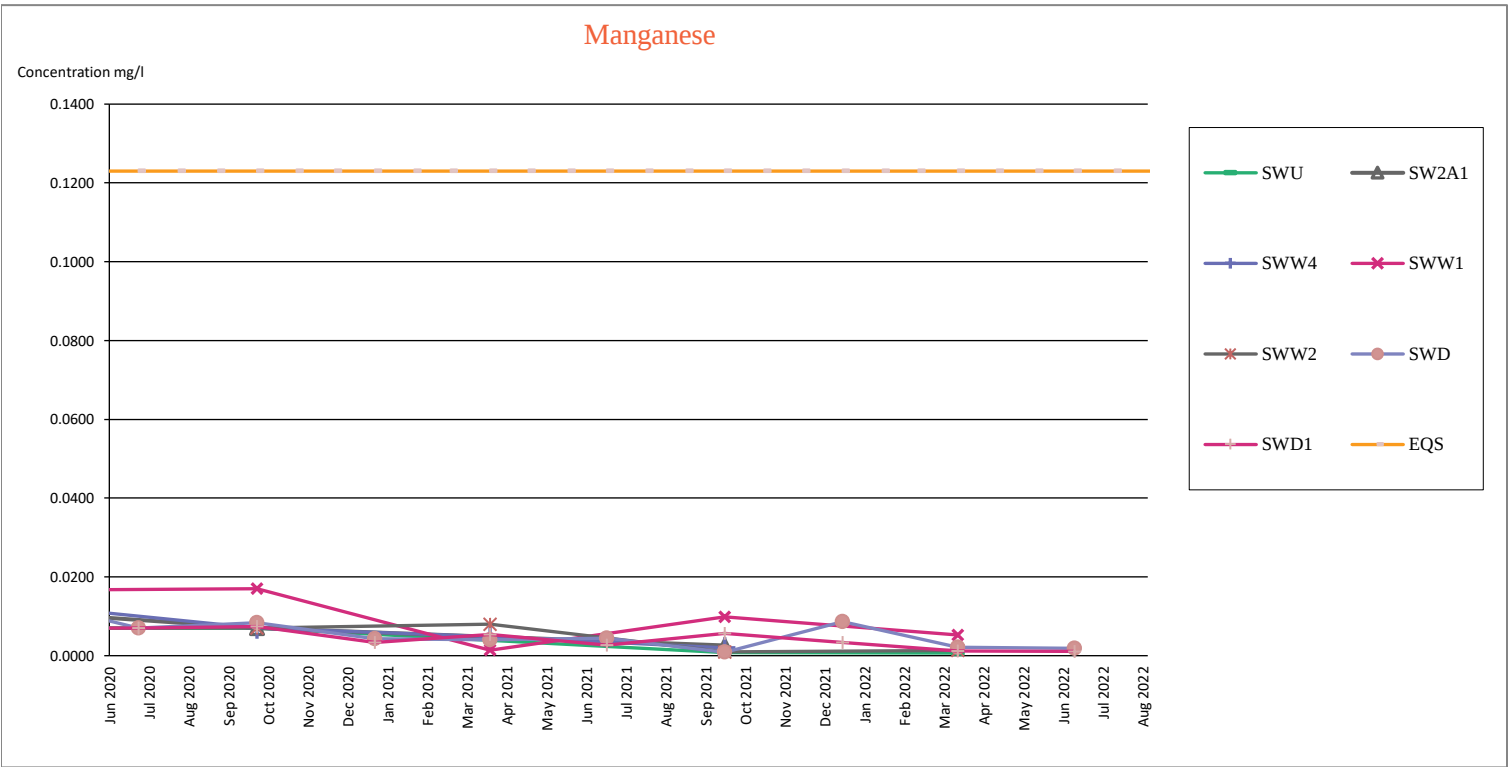


Figure A4
Surface water monitoring graphs

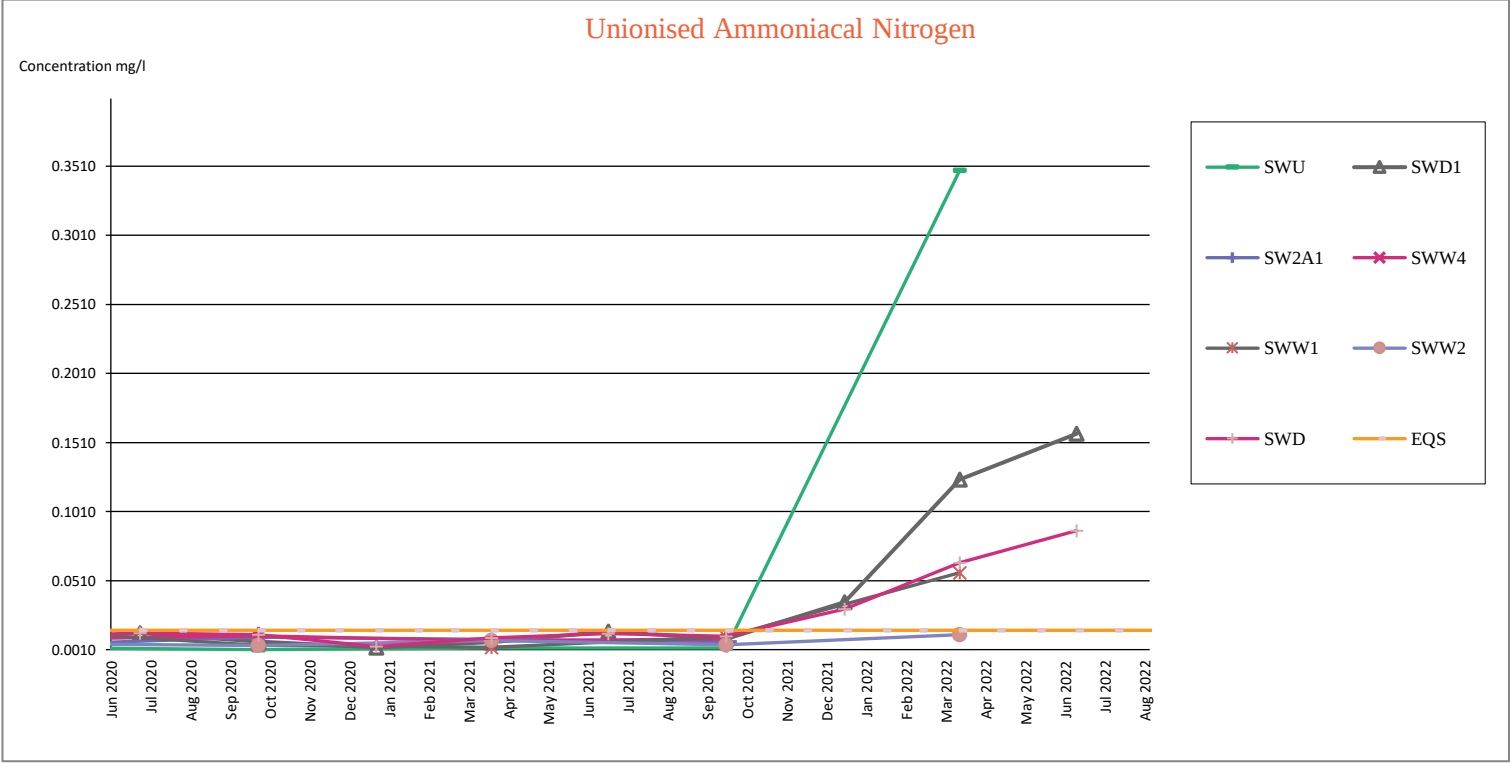
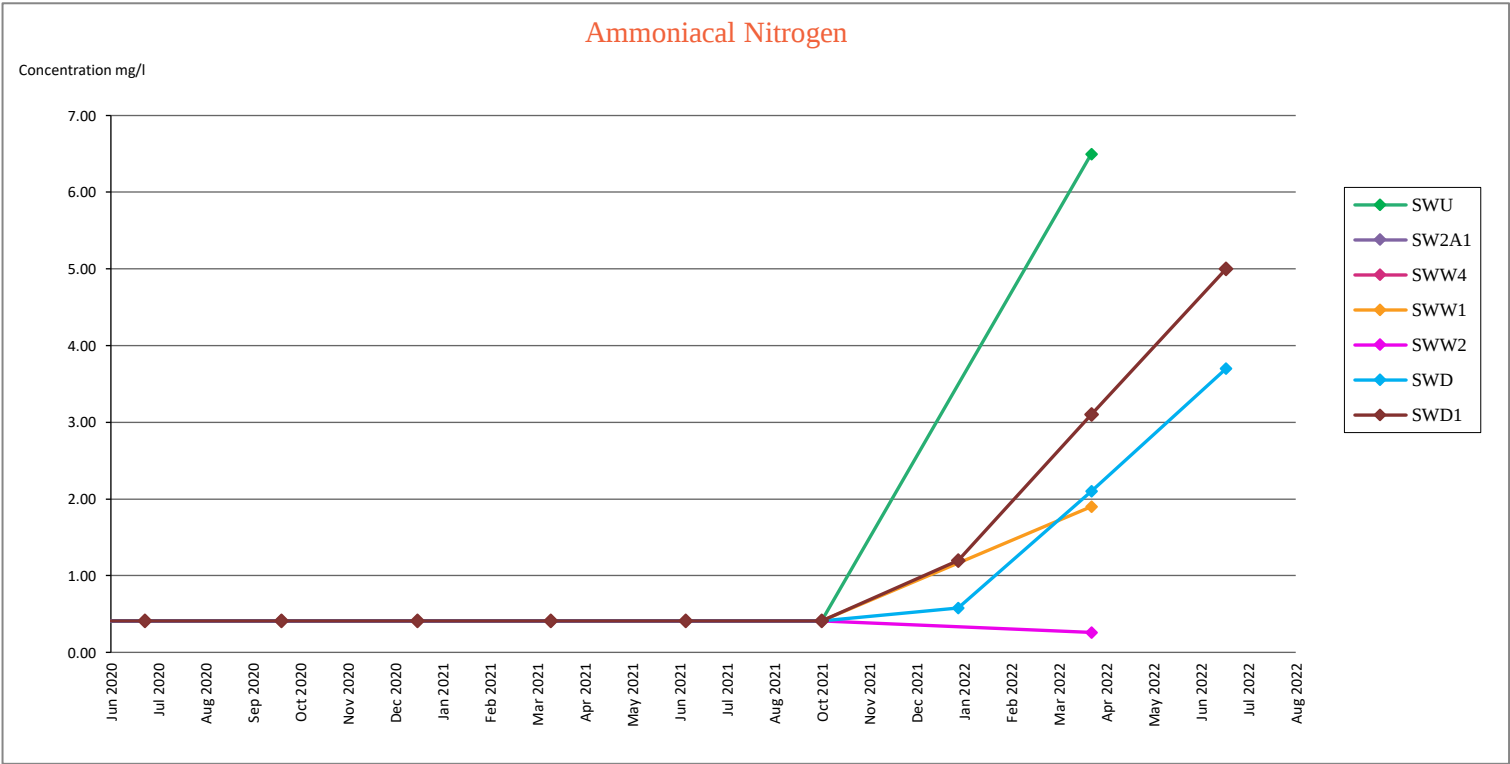


Figure A5
Groundwater quality monitoring results - Compliance wells graphs

Compliance wells graphs

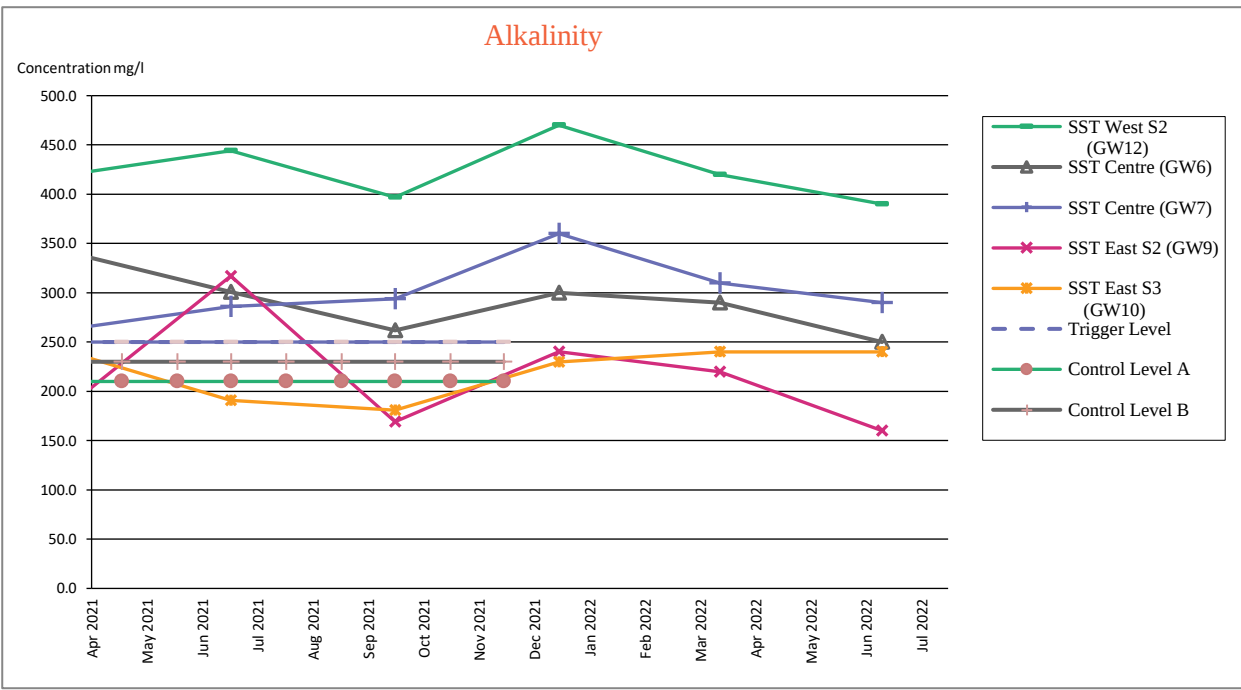
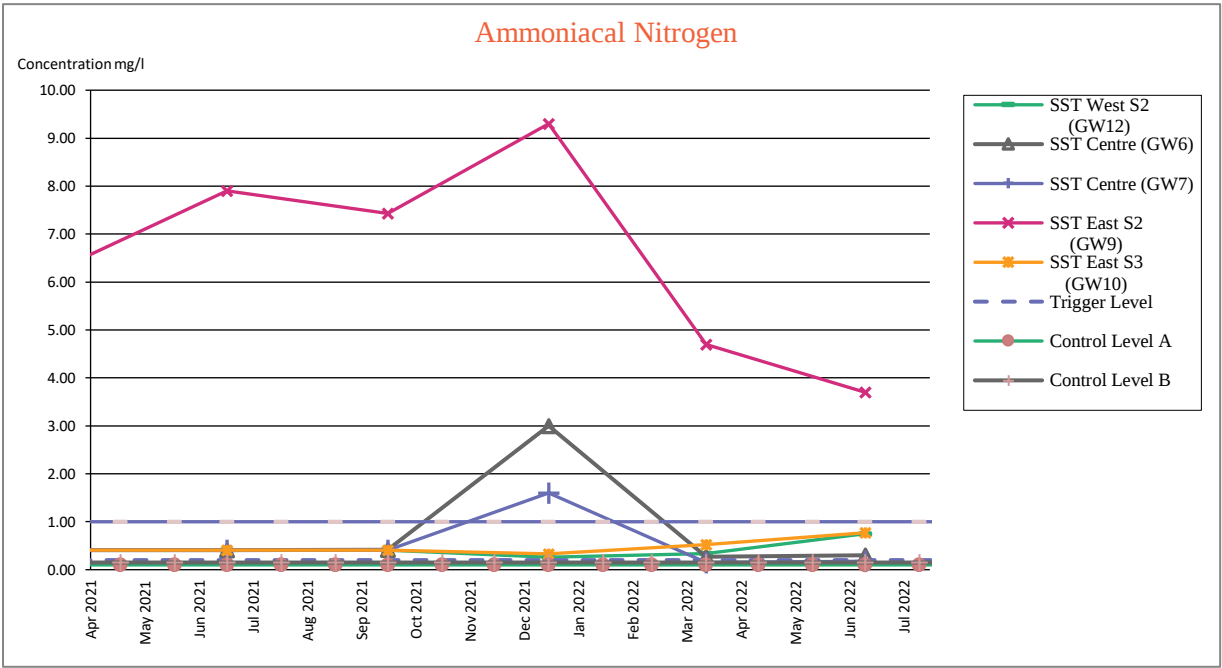
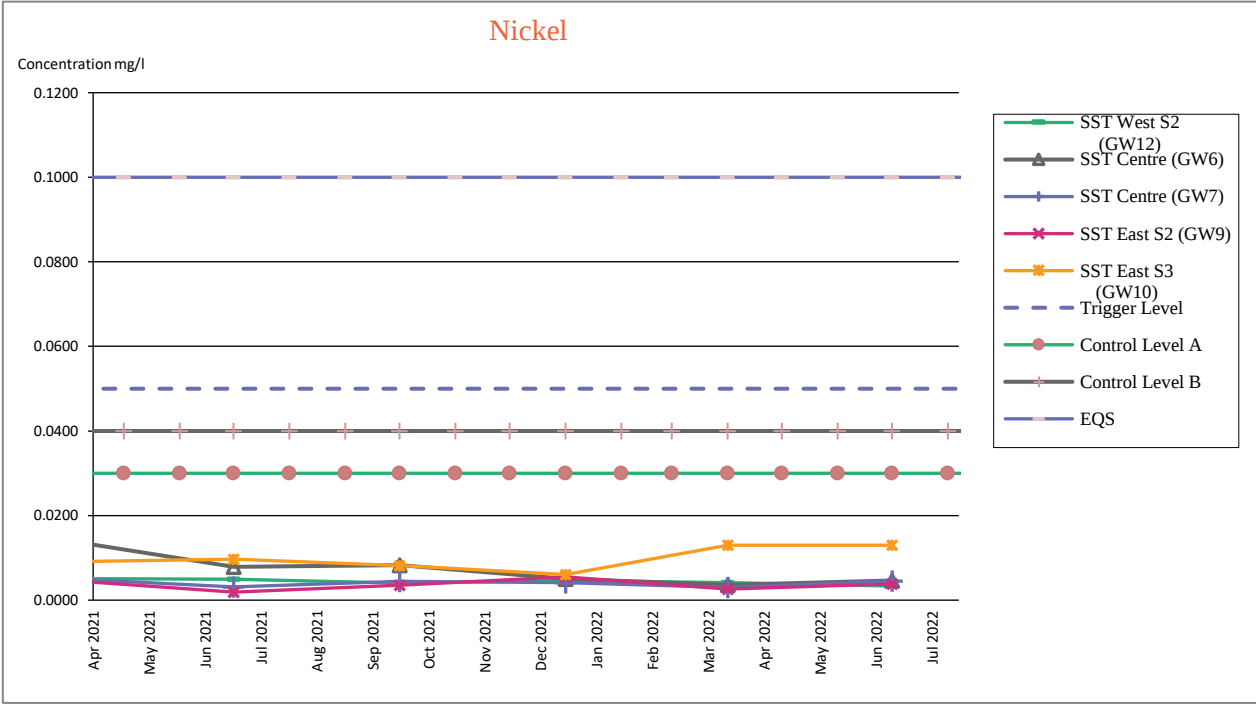
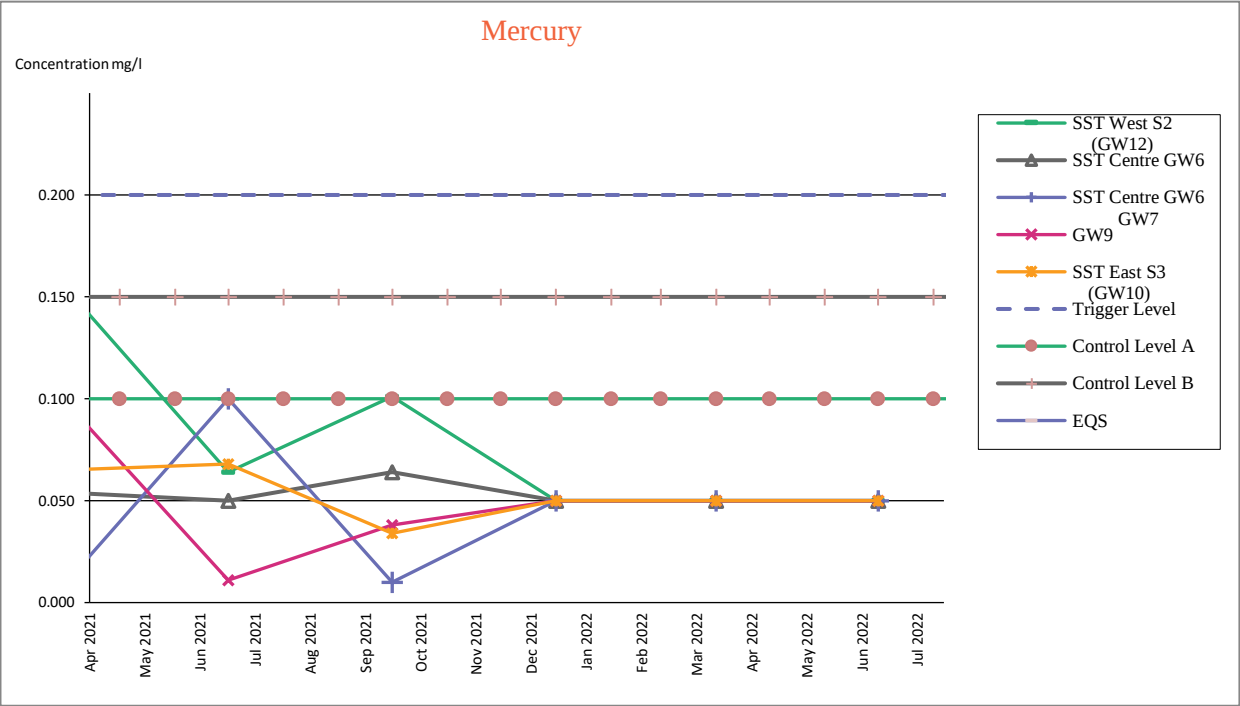


Figure A5
Groundwater quality monitoring results - Compliance wells graphs

Compliance wells graphs

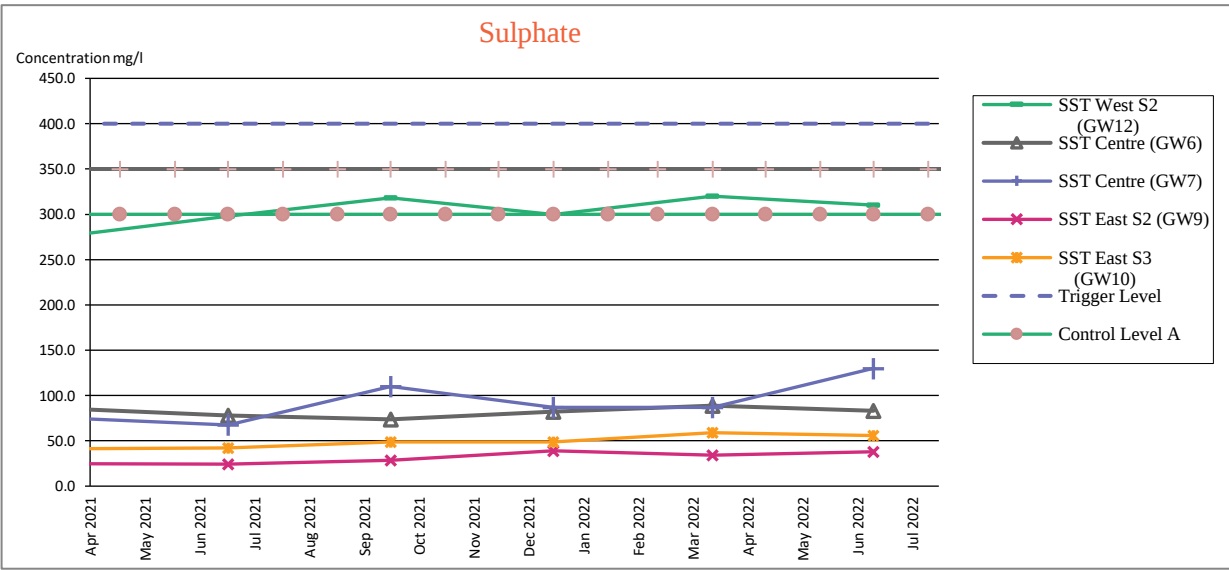
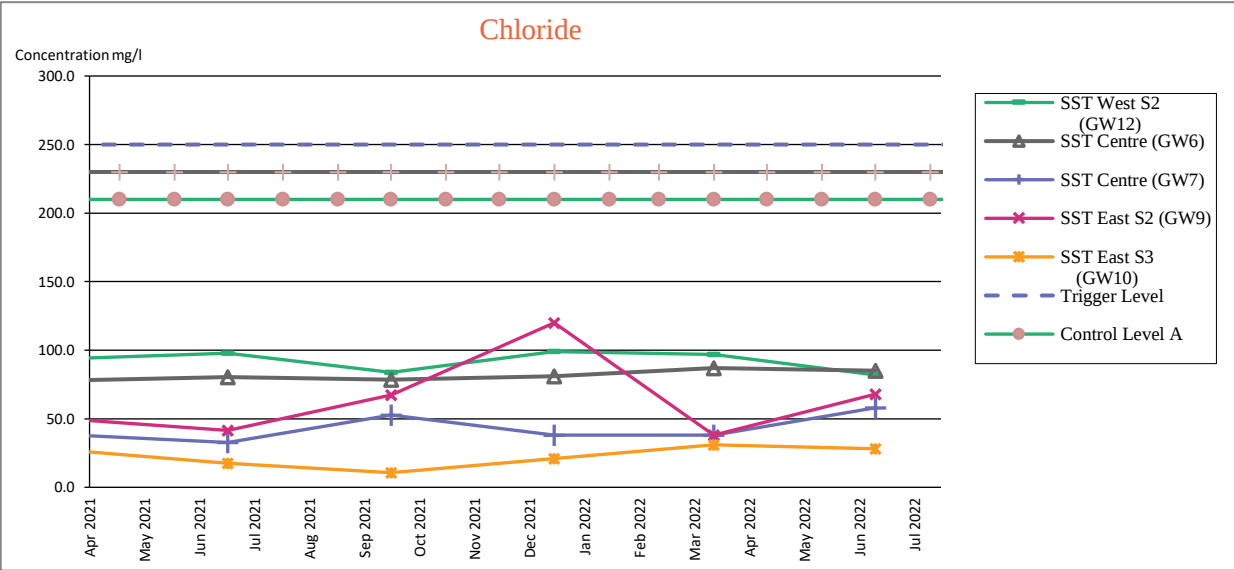
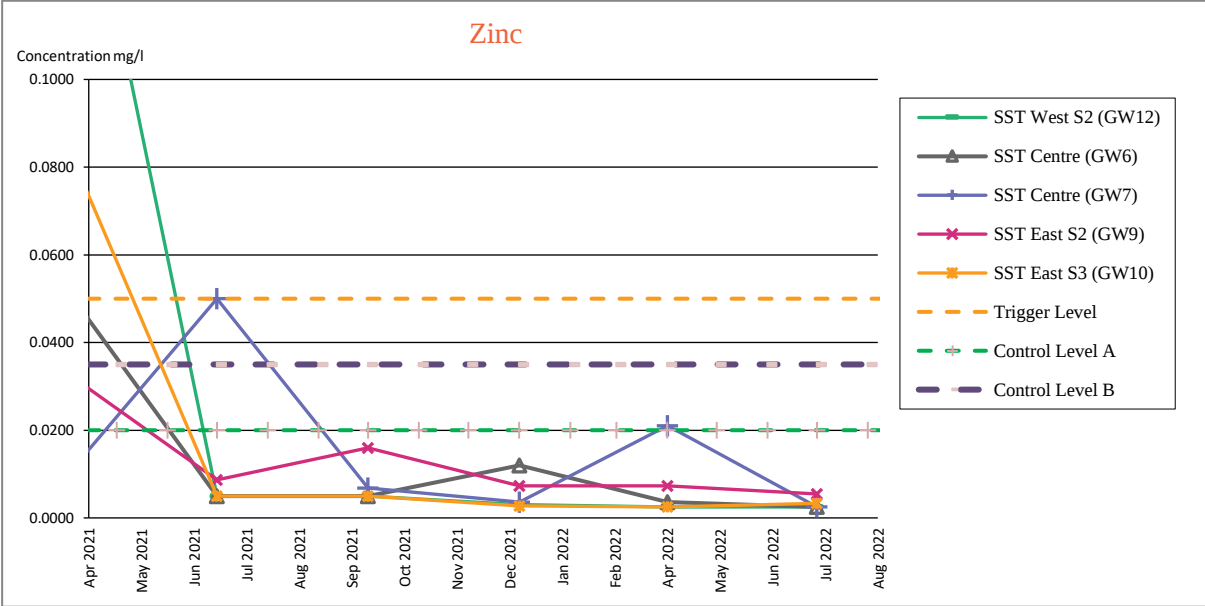
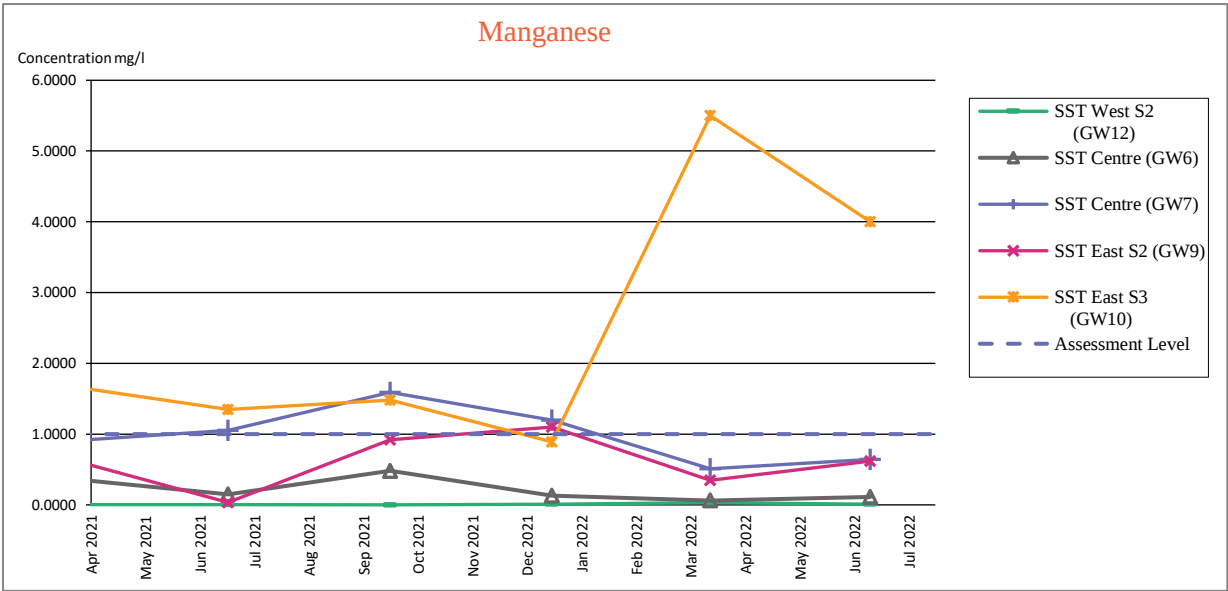


Figure A5
Groundwater quality monitoring results - Compliance wells graphs

Compliance wells graphs

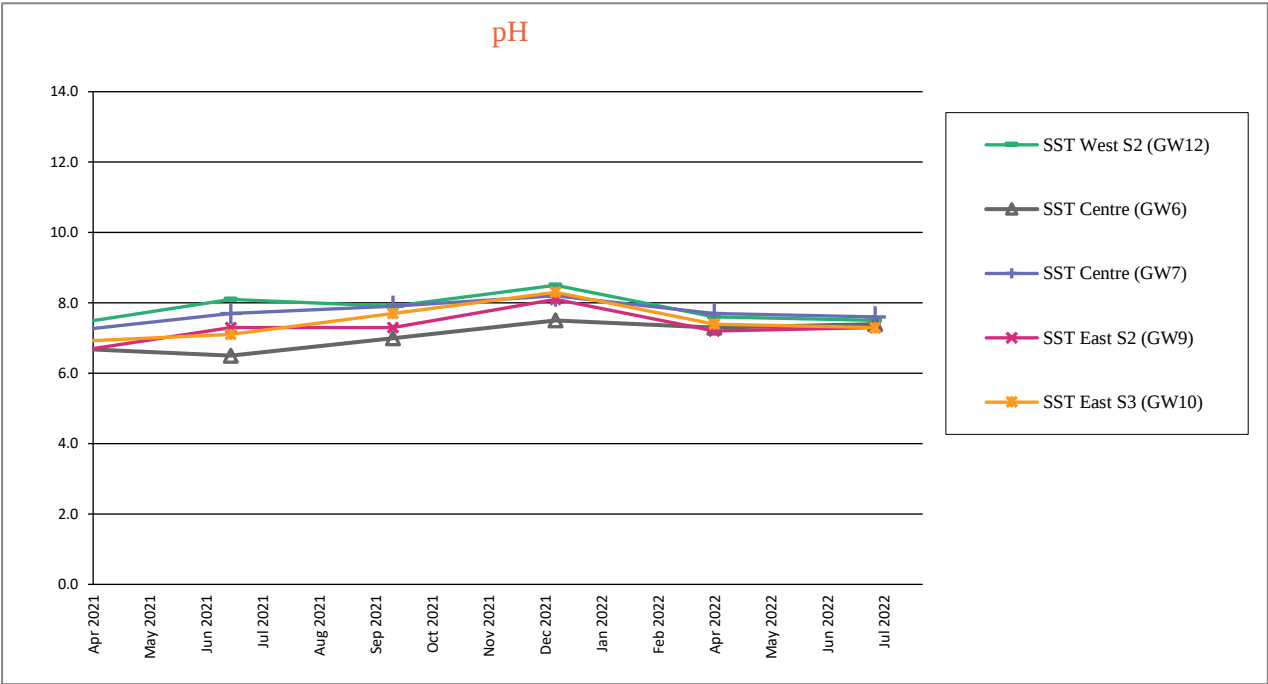


Figure A6
Groundwater quality monitoring results - Upstream wells graphs

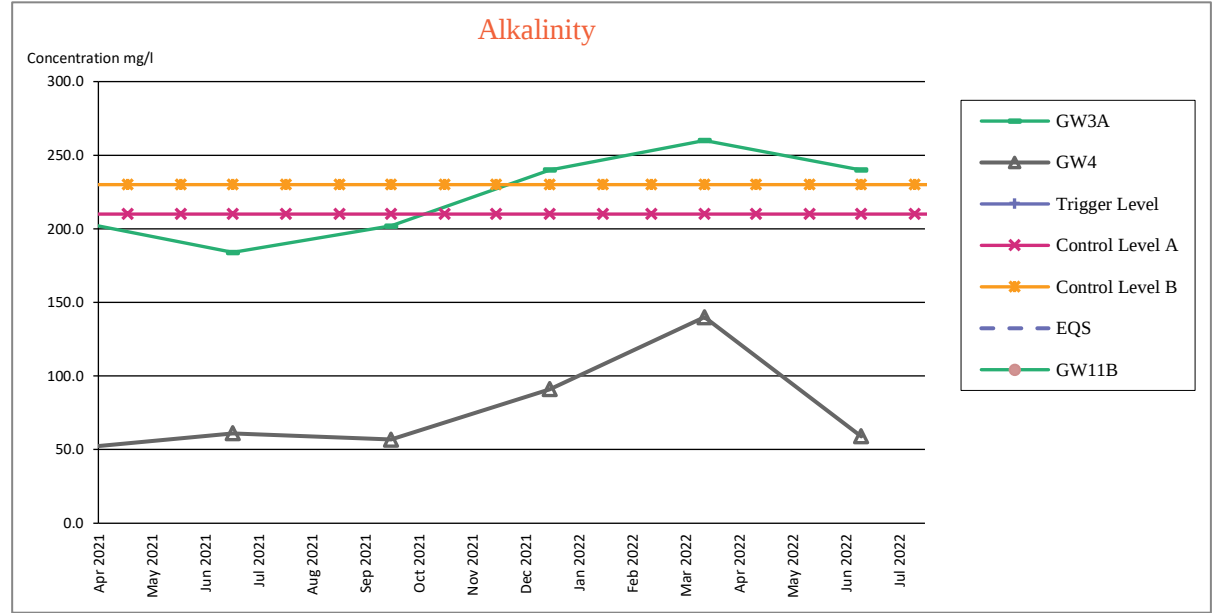
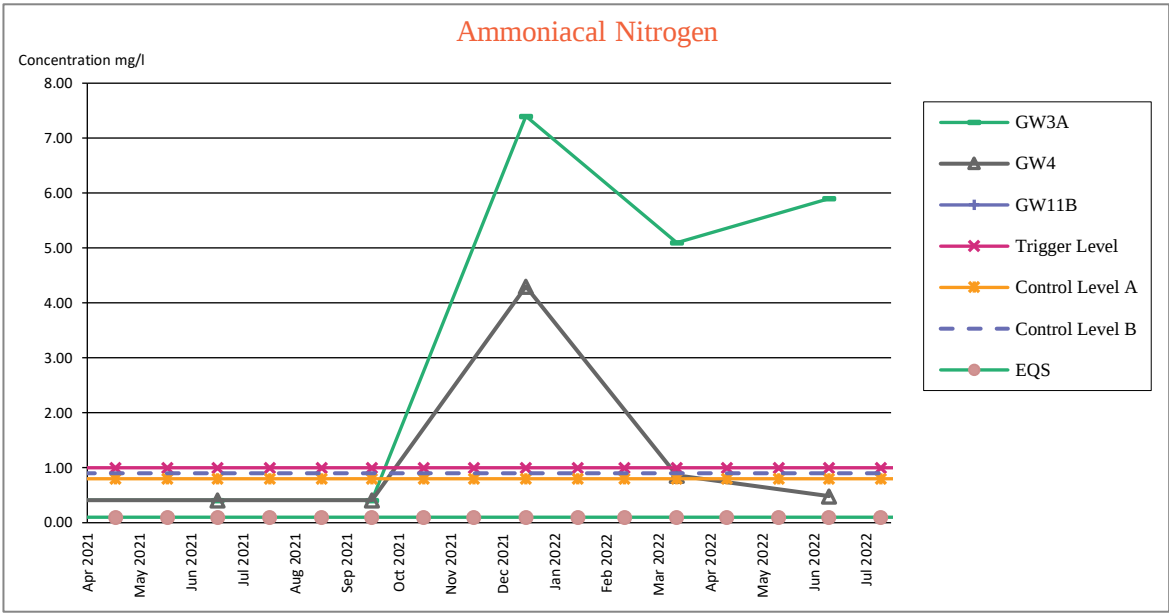
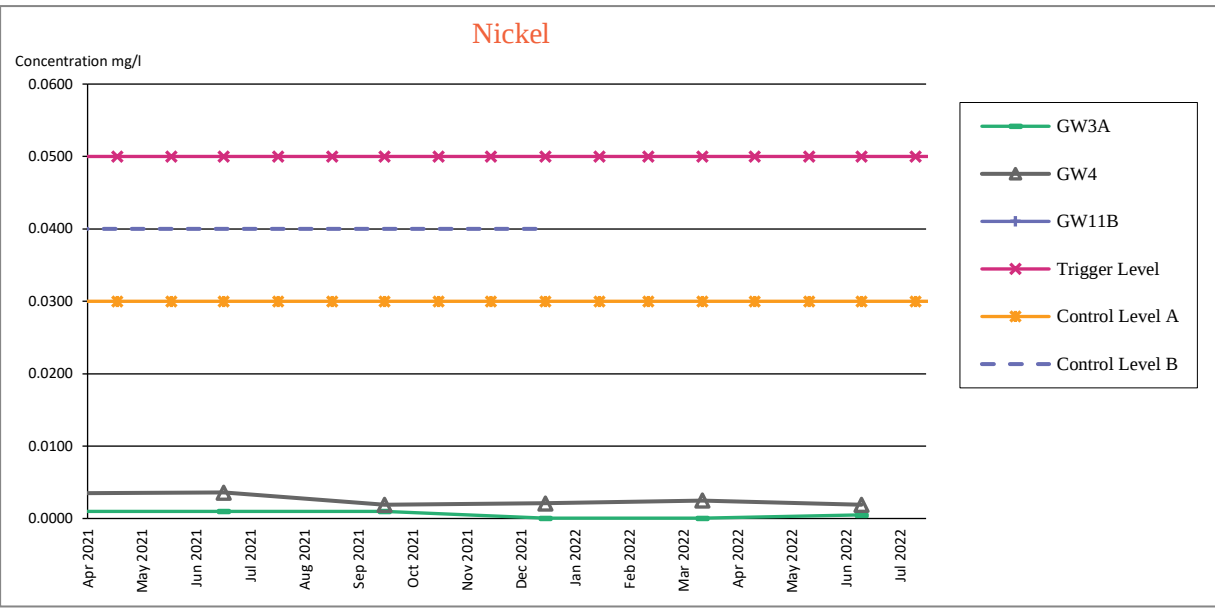
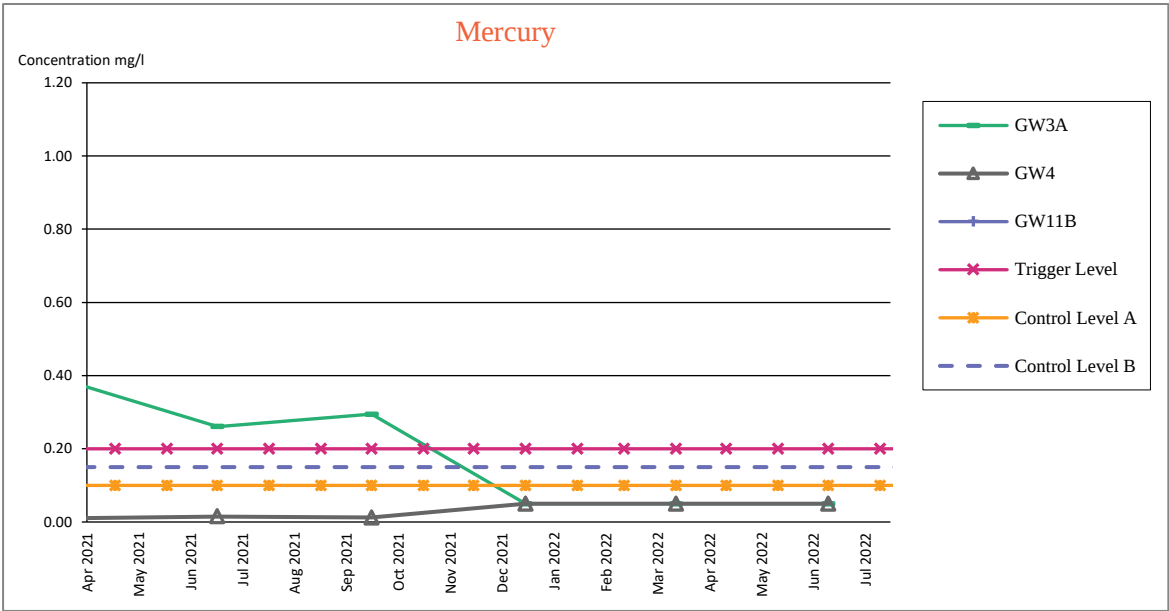


Figure A6
Groundwater quality monitoring results - Upstream wells graphs

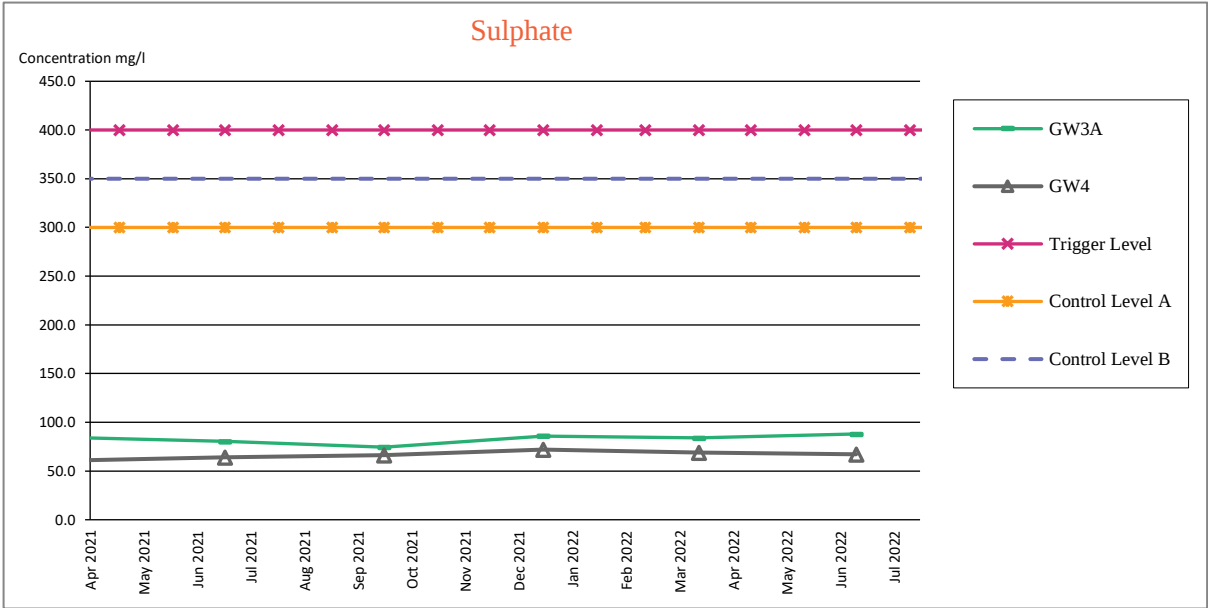
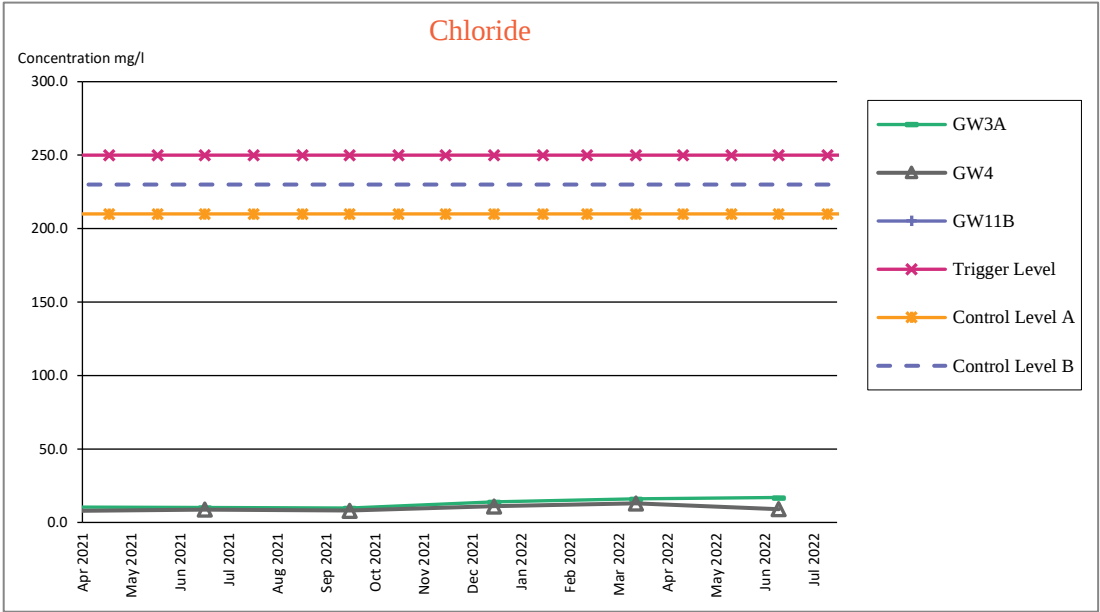
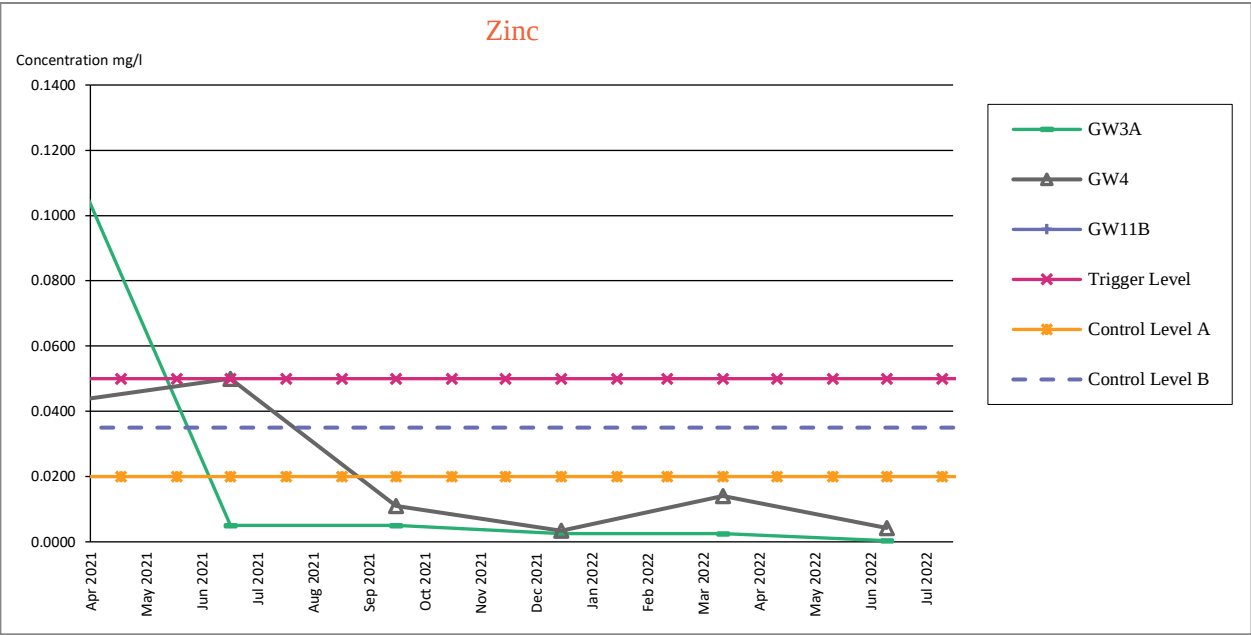
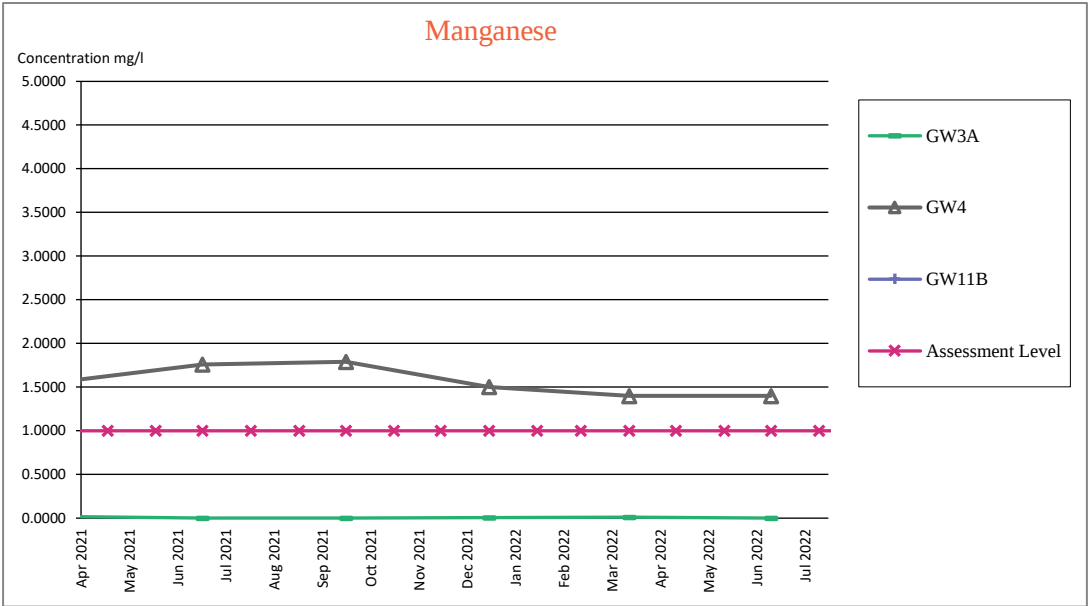


Figure A6
Groundwater quality monitoring results - Upstream wells graphs

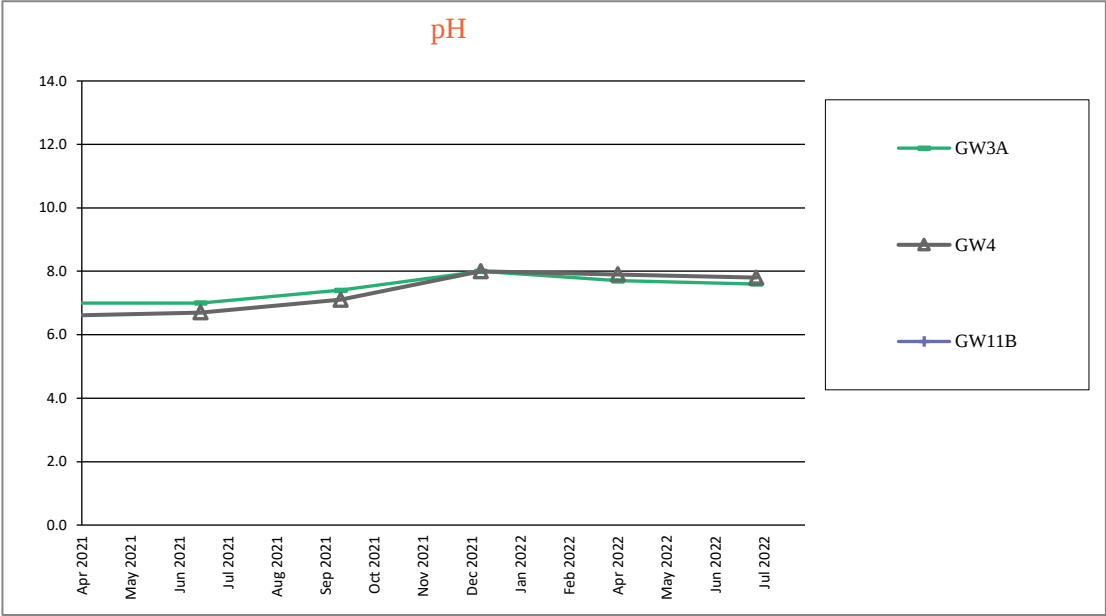
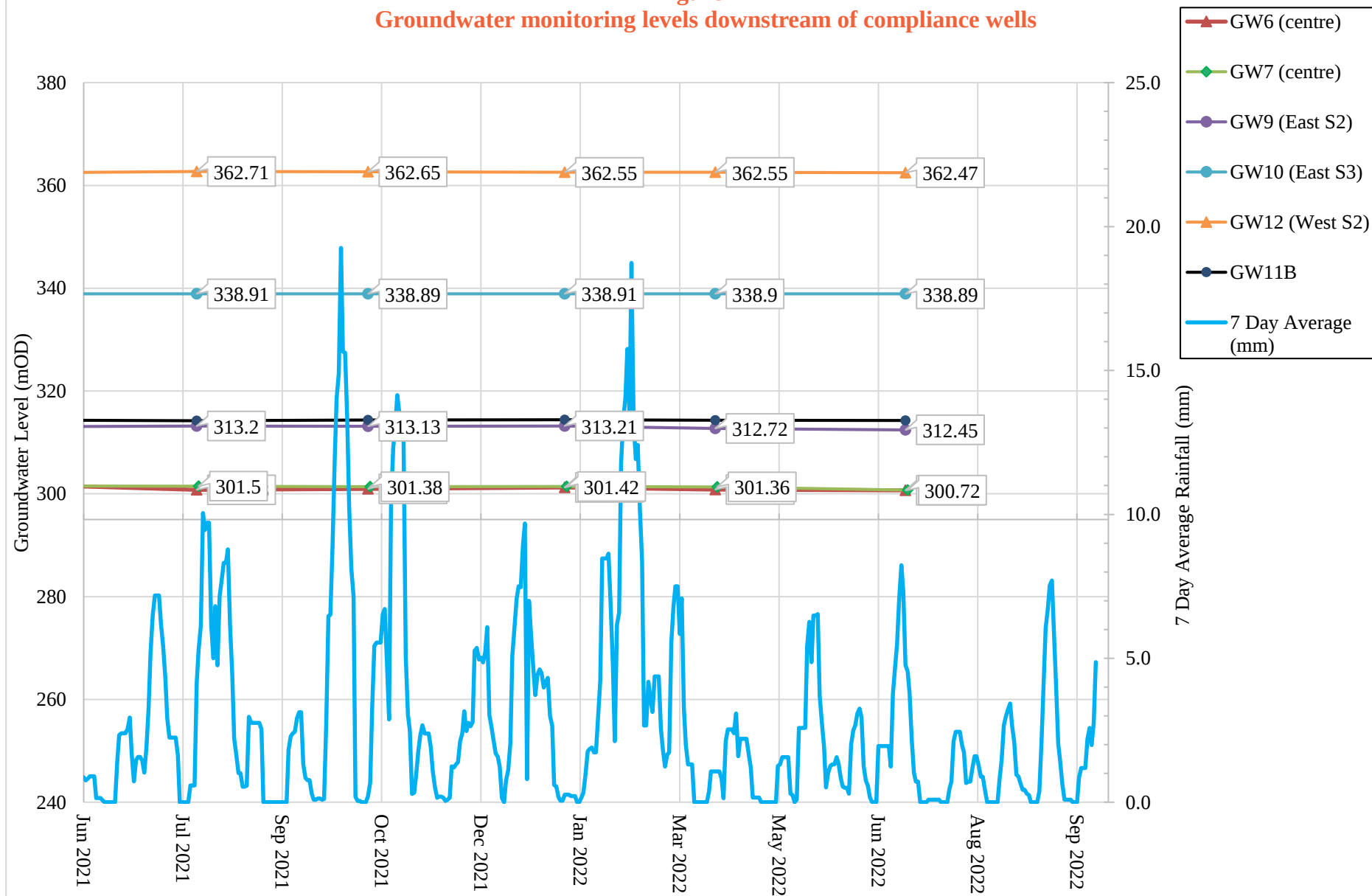


Figure A7
Groundwater monitoring levels downstream of compliance wells



A.2 Monitoring Results - Tables

Table B1 July 2022															
LOCATION	Units	L1A	L1B	LC1A	LC2A	LC4A	LC5A	Maximum concentration (mg/l)	Monthly Average (mg/l)	Acceptabl e Maximum Concentra tion (AMC)	LP3A	LP4			
Date Sampled	-							-	-	-					
Manganese in filtrate as Mn	mg/l	N/S	0.063	N/S	0.14	0.35	N/S	0.35	0.18	--	0.001	0.1			
Mercury, filt trace as Hg	mg/l	N/S	< 0.0005	N/S	< 0.0005	< 0.0005	N/S	0.0005	0.0005	0.00056	< 0.0005	< 0.0005			
Nickel in filtrate as Ni	mg/l	N/S	< 0.009	N/S	0.13	0.009	N/S	0.13	0.05	0.0681	0.009	0.007			
Zinc, ultra-low filtered as Zn	mg/l	N/S	0.005	N/S	0.038	0.005	N/S	0.038	0.02	1.38	0.003	0.005			
pH	pH Units	N/S	8	N/S	8.4	7.7	N/S	8.4	8.03	--	8.3	8			
Conductivity- Electrical 20C	uS/cm	N/S	2100	N/S	11000	4100	N/S	11000	5733	--	1800	2100			
Alkalinity as CaCO3	mg/l	N/S	380	N/S	4100	1700	N/S	4100	2060	--	370	800			
Ammoniacal Nitrogen as N	mg/l	N/S	0.86	N/S	630	160	N/S	630	264	526	< 1.2	33			
Chloride as Cl	mg/l	N/S	190	N/S	810	200	N/S	810	400	1408	220	190			
Sulphate as SO4	mg/l	N/S	410	N/S	780	54	N/S	780	415	999	370	170			
Redox Potential ^(see note 4)	mV	N/S	49	N/S	56	71	N/S	71	59	--	44	56			
Total Suspended Solids	mg/l	N/S	64	N/S	4800	1600	N/S	4800	2155	--	18	15			
Solids, Total Dissolved 180 deg C	mg/l	N/S	1300	N/S	7000	2600	N/S	7000	3633	--	1100	1400			
Dissolved Oxygen, Fixed	mg/l	N/S	8	N/S	8	8	N/S	-	-	--	8	8			
TOC (filtered)	mg/l	N/S	19	N/S	37	37	N/S	37	31.0	--	100	200			

- Notes
- < denotes 'less than'.
 - L1A,L1B, LC1A, LC2A,LC4A, LC5A: Wells in Waste.
 - denotes 'no acceptable maximum concentration available'.
 - The redox potential was not measured on site and there is a possibility that it has changed between sampling and analysis
 - LC5A is a replacement for LC5 well.
 - N/S denotes 'not sampled'.

Exceedance of AMC (per well)

Exceedance of AMC (monthly average)

Table B2
Leachate Head Levels

		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22
LC1A	Elevation of base of landfill mAOD	357.62			357.62			357.62					
	Elevation at top of casing mAOD	398.85			398.85			398.85					
	Depth to leachate from top of casing (m)	40.34			40.32			40.38					
	Leachate elevation (mAOD)	358.51			358.53			358.47					
	Calculated leachate head (m)	0.89			0.91			0.85					
LC2A	Elevation of base of landfill mAOD	362.49			362.49			362.49					
	Elevation at top of casing mAOD	401.12			401.12			401.12					
	Depth to leachate from top of casing (m)	35.76			35.75			35.54					
	Leachate elevation (mAOD)	365.36			365.37			365.58					
	Calculated leachate head (m)	2.87			2.88			3.09					
LC4A	Elevation of base of landfill mAOD	372.27			372.27			372.27					
	Elevation at top of casing mAOD	401.14			401.14			401.14					
	Depth to leachate from top of casing (m)	26.81			26.84			26.90					
	Leachate elevation (mAOD)	374.33			374.30			374.24					
	Calculated leachate head (m)	2.06			2.03			1.97					
LC5A	Elevation of base of landfill mAOD	350.14			350.14			350.14					
	Elevation at top of casing mAOD	380.75			380.75			380.75					
	Depth to leachate from top of casing (m)	DAMAGED			DAMAGED			DAMAGED					
	Leachate elevation (mAOD)												
	Calculated leachate head (m)												
L1	Casing height (mAOD)	357.00			357.00			357.00					
	Leachate (mbgl)	DRY			DRY			DRY					
	Leachate (m AOD)	-			-			-					
	Base of landfill (m AOD)	336.80			336.80			336.80					
	Depth of well from top of casing (m)	21.03			21.03			21.03					
	Base of well (m AOD)	335.97			335.97			335.97					
	Calculated leachate head (m)												
L1A*	Casing height (mAOD)	355.79			355.79			355.79					
	Leachate (mbgl)	DRY			20.90			20.90					
	Leachate (m AOD)	-			334.89			334.89					
	Base of landfill (m AOD)	316.64			316.64			316.64					
	Depth of well from top of casing (m)	20.89			20.91			20.91					
	Base of well (m AOD)	334.90			334.88			334.88					
	Calculated leachate head (m)				18.25			18.25					
L1B*	Casing height (mAOD)	354.80			354.80			354.80					
	Leachate (mbgl)	24.97			25.87			26.87					
	Leachate (m AOD)	329.83			328.93			327.93					
	Base of landfill (m AOD)	319.60			319.60			319.60					
	Depth of well from top of casing (m)	34.84			34.84			34.84					
	Base of well (m AOD)	319.96			319.96			319.96					
	Calculated leachate head (m)	10.23			9.33			8.33					

2022	Quarterly Leachate Head Averages (m)
January	1.94
February	
March	
April	1.94
May	
June	
July	1.97
August	
September	
October	
November	
December	

Minimum monthly leachate head average

Maximum monthly leachate head average

- Notes:
- Top of casings were re-surveyed in August 2019
- LC1A top of casing is 1710mm above ground level.
 - LC2A top of casing is 820mm above GL.
 - LC4A top of casing is 1040mm above GL.
 - LC5A top of casing is 1050mm above GL.

* Well not included in monthly average.

Note: L1 is generally dry or with very little water in it.

Table B3
Surface Water Monitoring Results

Month	Location	Date	Mercury, ultra-low total as Hg		Manganese in filtrate as Mn		Nickel in filtrate as Ni		Bioavailable Ni	Zinc, ultra-low total as Zn	Bioavailable Zn	pH	Conductivity-Electrical 20C	Ammoniacal Nitrogen as N	*Unionised Ammoniacal Nitrogen based on measured Temperature	Measured surface water temperature	Chloride as Cl	Sulphate as SO4	Total Suspended Solids	Dissolved Oxygen, fixed	TOC, filtered	Redox Potential	Alkalinity as CaCO3	Calcium		
Freshwater EQS**			ug/l		mg/l		mg/l		mg/l		mg/l		uS/cm	mg/l	mg/l	°C	mg/l	mg/l	mg/l	mg/l	mg/l	mV	mg/l	mg/l		
January	Upstream of Landfill	SWU	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S		
		SW2AI	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S		
		SWW4	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S		
	NW Ditch System	SWW1	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S		
		SWW2	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S		
	Downstream of Landfill	SWD	<	0.05	0.01	0.001	<	0.001	0.003	0.002	8.60	410	0.58	0.030	6.10	8.70	70.00	5.00	-	2.00	51.00	91.00	31.00			
	SWD1	<	0.05	0.003	0.002	<	0.001	0.005	<	0.001	8.40	300	1.20	0.035	4.20	13.00	63.00	5.00	-	17.00	56.00	75.00	26.00			
April	Upstream of Landfill	SWU	<	0.05	0.001	0.001	0.001	0.004	0.003	8.50	120	6.500	0.348	9.5	6.7	22.0	30.0	-	<	2.0	51.0	130.0	6.4			
		SW2AI	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
		SWW4	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
	NW Ditch System	SWW1	<	0.05	0.005	0.001	0.001	<	0.003	0.002	8.200	420	1.900	0.057	10.6	9.6	120.0	24.0	-	<	2.0	74.0	180.0	37.0		
		SWW2	<	0.05	0.001	0.001	0.001	<	0.003	0.002	8.400	220	0.260	0.012	10.3	300.0	87.0	13.0	-	<	2.0	72.0	140.0	16.0		
	Downstream of Landfill	SWD	<	0.05	0.002	0.001	0.004	0.005	0.003	8.200	510	2.100	0.064	10.9	11.0	110.0	47.0	-	<	2.0	54.0	190.0	43.0			
	SWD1	<	0.05	0.001	0.001	0.001	<	0.003	0.002	8.300	430	3.100	0.124	11.6	4.0	110.0	92.0	-	2.0	57.0	180.0	38.0				
July	Upstream of Landfill	SWU	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
		SW2AI	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
		SWW4	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
	NW Ditch System	SWW1	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
		SWW2	N/S		N/S		N/S		N/S		N/S		N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
	Downstream of Landfill	SWD	<	0.05	0.0019	0.001	0.0002	0.005	0.001	8.0	490.0	3.7	0.087	13.5	7.6	130.0	54.0	7.8	30.0	59.0	140.0	55.0				
	SWD1	<	0.05	0.0011	0.001	0.0003	0.003	0.0001	8.1	460.0	5.0	0.157	14.4	13.0	110.0	14.0	7.9	28.0	62.0	140.0	53.0					
Minimum			<	0.0000	<	0.0000	<	0.0000	<	0.0000	<	0.0000	<	<	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		
Maximum			<	0.0000	<	0.0000	<	0.0000	<	0.0000	<	0.0000	<	<	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		

Exceedance of EQS

Upstream of Nant Merddog

Downstream of Nant Merddog

Notes

1.The redox potential was not measured on site and there is a possibility that it has changed between sampling and analysis

2.N/S - Not analysed

3.Unionised ammoniacal nitrogen based on measured

4.Environmental Quality Standard EQS 1 for freshwater is derived to protect the most sensitive aquatic life.

5.NW Ditch - North Western (ditch system)

Table B4
Groundwater monitoring results

Location	Month	Date	Test reference number	Redox Potential	Mercury, filtrate as Hg	Manganese in filtrate as Mn	Nickel in filtrate as Ni	Zinc, ultra-low filtered as Zn	pH	Electrical Conductivity 20C	Alkalinity as CaCO3	Ammoniacal Nitrogen as N	Unionised Ammoniacal Nitrogen ***	Measure water temperature	Chloride as Cl	Sulphate as SO4	Calcium	D.O. concentration	TOC (Filtered)				
					mV	ug/l	mg/l	mg/l	pH units	uS/cm	mg/l	mg/l	mg/l	°C	mg/l	mg/l	mg/l	mg/l	mg/l				
Trigger Level					(0.2 ^m)		0.05	(0.05 ^m)	--	--	--	1	--	--	250	400	--	--	--				
Control Level A					(0.1 ^m)	--	0.03	(0.02 ^m)	--	--	--	0.8	--	--	210	300	--	--	--				
Control Level B					(0.15 ^m)	--	0.04	(0.035 ^m)	--	--	--	0.9	--	--	230	350	--	--	--				
Assessment Level					--	(1.0 ^m)	--	--	--	--	--	--	--	--	--	--	--	--	--				
UPSTREAM WELLS																							
SST East S3																							
GW3A	Jan-21	21/01/21	20069616	108	0.23	0.0089	0.0015	0.0067	6.7	519.0	203.0	<	0.41	0.0005	13.1	11.1	91.2	79.0	8.7	2.1			
	Feb-21		Quarterly																				
	Mar-21																						
	Apr-21	27/04/21	20384851	-26	0.39	0.019	<	0.0010	0.1200	7.0	514.0	205.0	<	0.41	0.0010	13.4	10.4	84.6	N/S	7.1	1.5		
	May-21		Quarterly																				
	Jun-21																						
	Jul-21	20/07/21	20670057	-318	0.26	0.0014	<	0.0010	<	0.0050	7.0	481.0	184.0	<	0.41	0.0010	13.8	10.2	80.5	60.0	8.0	1.7	
	Aug-21		Quarterly																				
	Sep-21																						
	Oct-21	18/10/21	20977670	-248	0.30	0.0016	<	0.0010	<	0.0050	7.4	487.0	202	<	0.41	0.0025	13.2	9.8	74.5	68.0	8.5	1.4	
	Nov-21		Quarterly																				
	Dec-21																						
	Jan-22	20/01/22	1357005	87	<	0.05	0.0085	<	0.00005	<	0.0025	8.0	680.0	240.0	7.40	0.1668	12.9	14.0	86.0	58.0	-	3.1	
	Feb-22		Quarterly																				
	Mar-22																						
	Apr-22	10/05/22	1430017	32	<	0.05	0.011	<	0.00005	<	0.0025	7.7	1100.0	260.0	5.10	0.0618	13.7	16.0	84.0	61.0	-	<	2.0
	May-22		Quarterly																				
	Jun-22																						
	Jul-22	11/08/22	1487914	50	0.05	0.0010	0.0005	0.0004	7.6	640.0	240.0	5.90	0.0646	15.4	17.0	88.0	67.0	8.0	51.0				
	Aug-22		Quarterly																				
	Sep-22																						
	Oct-22																						
	Nov-22																						
	Dec-22																						
GW4	Jan-21	20/01/21	20069616	103	<	0.01	1.56	0.0035	0.0076	6.7	268.0	63.2	<	0.41	0.0004	9.1	10.0	68.7	19.0	10.2	8.7		
	Feb-21		Quarterly																				
	Mar-21																						
	Apr-21	27/04/21	20384852	-92	<	0.01	1.56	0.0035	0.0430	6.6	243.0	51.0	<	0.41	0.0003	10.0	7.8	60.7	N/S	1.7	<	0.7	
	May-21		Quarterly																				
	Jun-21																						
	Jul-21	27/07/21	20670058	-361	0.02	1.76	0.0036	0.0500	6.7	257.0	61.0	<	0.41	0.0005	12.3	8.8	64.0	18.0	1.3	<	0.7		
	Aug-21		Quarterly																				
	Sep-21																						
	Oct-21	18/10/21	20977671	-261	0.01	1.79	0.0019	0.0110	7.1	251.0	56.8	<	0.41	0.0011	9.8	8.0	66.2	18.0	2.9	<	0.7		
	Nov-21		Quarterly																				
	Dec-21																						
	Jan-22	20/01/22	1357006	39	<	0.05	1.50	0.0021	0.0034	8.0	320.0	91.0	4.30	0.0745	9.3	11.0	72.0	15.0	-	<	2.0		
	Feb-22		Quarterly																				
	Mar-22																						
	Apr-22	10/05/22	1430018	34	<	0.050	1.4	0.0025	0.0140	7.9	290.0	140.0	0.86	0.0121	9.5	13.0	69.0	14.0	-	<	2.0		
	May-22		Quarterly																				
	Jun-22																						
	Jul-22	11/08/22	1487920	66	0.05	1.4000	0.0019	0.0042	7.8	320.0	59.0	0.48	0.0059	10.9	9.1	67.0	16.0	8.0	16.0				
	Aug-22		Quarterly																				
	Sep-22																						
	Oct-22																						
	Nov-22																						
	Dec-22																						
GW11B	Jan-22		Not sampled																				
	Feb-22		Quarterly																				
	Mar-22																						
	Apr-22		Not sampled																				
	May-22		Quarterly																				
	Jun-22																						
	Jul-22		Not sampled																				
	Aug-22		Quarterly																				
	Sep-22																						
	Oct-22		Not sampled																				
	Nov-22		Quarterly																				
	Dec-22																						

Table B4
Groundwater monitoring results

Location	Month	Date	Test reference number	Redox Potential	Mercury, filtrate as Hg	Manganese in filtrate as Mn	Nickel in filtrate as Ni	Zinc, ultra-low filtered as Zn	pH	Electrical Conductivity 20C	Alkalinity as CaCO3	Ammoniacal Nitrogen as N	Unionised Ammoniacal Nitrogen ***	Measure water temperature	Chloride as Cl	Sulphate as SO4	Calcium	D.O. concentration	TOC (Filtered)			
				mV	ug/l	mg/l	mg/l	mg/l	pH units	uS/cm	mg/l	mg/l	mg/l	°C	mg/l	mg/l	mg/l	mg/l	mg/l			
Trigger Level					(0.2*)		0.05	(0.05*)	--	--	--	1	--	--	250	400	--	--	--			
Control Level A					(0.1*)	--	0.03	(0.02*)	--	--	--	0.8	--	--	210	300	--	--	--			
Control Level B					(0.15*)	--	0.04	(0.035*)	--	--	--	0.9	--	--	230	350	--	--	--			
Assessment Level					--	(1.0*)	--	--	--	--	--	--	--	--	--	--	--	--	--			
DOWNSTREAM WELLS / COMPLIANCE WELLS																						
SST West S2																						
GW12	Jan-21	20/01/21	20069623	137	0.019	0.0081	0.0013	<	0.0050	7.0	454.0	184.0	<	0.41	0.0016	20.1	15.0	48.3	55.0	8.8	2.4	
	Feb-21		Quarterly																			
	Mar-21																					
	Apr-21	27/04/21	20384858	-173	0.15	0.0015	0.0051	0.1700	7.4	1530.0	420.0	<	0.41	0.0038	19.3	93.8	276.0	N/S	6.0	10.9		
	May-21		Quarterly																			
	Jun-21																					
	Jul-21	27/07/21	20670064	-271	0.06	0.0009	0.0050	<	0.0050	8.1	1620.0	444.0	<	0.41	0.0190	19.8	97.8	298.0	146.0	5.7	9.2	
	Aug-21		Quarterly																			
	Sep-21																					
	Oct-21	18/10/21	20977677	-296	0.10	0.0005	0.0040	<	0.0050	7.9	1520.0	397.0	<	0.41	0.0122	18.5	83.8	318.0	161.0	6.6	8.5	
	Nov-21		Quarterly																			
	Dec-21																					
	Jan-22	20/01/22	1357011	62	<	0.050	0.0100	0.0047	0.0030	8.5	1600.0	470.0	0.26	0.0265	18.8	99.0	300.0	130.0	-	<	2.0	
	Feb-22		Quarterly																			
	Mar-22																					
	Apr-22	10/05/22	1430023	70	<	0.050	0.032	0.0041	<	0.0025	7.6	1600.0	420.0	0.34	0.0044	17.6	97.0	320.0	130.0	-	7.1	
	May-22		Quarterly																			
	Jun-22																					
	Jul-22	11/08/22	1487925	56	<	0.05	0.0081	0.0033	<	0.0025	7.5	1500.0	390.0	0.75	0.0076	17.5	82.0	310.0	110.0	7.8	100.0	
	Aug-22		Quarterly																			
	Sep-22																					
	Oct-22																					
	Nov-22																					
	Dec-22																					
SST Centre																						
GW6	Jan-21	20/01/21	20069618	137	0.036	0.4410	0.0098	<	0.0050	6.6	901.0	303.0	<	0.41	0.0004	12.0	82.2	96.6	54.0	4.1	4.8	
	Feb-21		Quarterly																			
	Mar-21																					
	Apr-21	27/04/21	20384853	-94	0.05	0.3740	0.0140	0.0520	6.7	935.0	341.0	<	0.41	0.0004	11.8	77.9	85.5	N/S	3.2	4.7		
	May-21		Quarterly																			
	Jun-21																					
	Jul-21	27/07/21	20670059	-318	0.05	0.1480	0.0079	<	0.0050	6.5	879.0	301.0	<	0.41	0.0003	12.8	80.4	77.9	57.0	2.5	5.1	
	Aug-21		Quarterly																			
	Sep-21																					
	Oct-21	18/10/21	20977672	-252	0.06	0.4820	0.0083	<	0.0050	7.0	799.0	262.0	<	0.42	0.0009	12.4	78.6	73.7	54.0	2.6	3.6	
	Nov-21		Quarterly																			
	Dec-21																					
	Jan-22	20/02/22	1357007	62	<	0.05	0.1300	0.0051	0.0120	7.5	850.0	300.0	3.00	0.0193	11.3	81.0	82.0	33.0	-	3.9		
	Feb-22		Quarterly																			
	Mar-22																					
	Apr-22	10/05/22	1430019	62	<	0.050	0.061	0.0036	0.0036	7.3	850.0	290.0	0.27	0.0012	12.0	87.0	89.0	46.0	-	3.3		
	May-22		Quarterly																			
	Jun-22																					
	Jul-22	11/08/22	1487921	61	<	0.050	0.1100	0.0046	<	0.0025	7.4	780.0	250.0	0.30	0.0016	12.2	85.0	83.0	41.0	8.0	59.0	
	Aug-22		Quarterly																			
	Sep-22																					
	Oct-22																					
	Nov-22																					
	Dec-22																					
GW7	Jan-21	20/01/21	20069619	111	<	0.010	0.0071	0.0052	0.0120	7.1	837.0	312.0	<	0.41	0.0011	11.8	46.9	80.6	85.0	4.1	5.3	
	Feb-21		Quarterly																			
	Mar-21																					
	Apr-21	27/04/21	20384854	-168	<	0.010	0.9050	0.0051	0.0097	7.2	736.0	263.0	<	0.41	0.0014	11.7	38.3	75.1	N/S	4.5	4.7	
	May-21		Quarterly																			
	Jun-21																					
	Jul-21	27/07/21	20670060	-321	<	0.10	1.0500	0.0031	<	0.0500	7.7	679.0	286.0	<	0.41	0.0048	13.2	32.7	67.5	84.0	3.5	5.2
	Aug-21		Quarterly																			
	Sep-21																					
	Oct-21	18/10/21	20977673	-254	<	0.01	1.5900	0.0044	0.0068	7.9	853.0	294.0	<	0.41	0.0075	12.0	52.7	110.0	85.0	3.6	5.9	
	Nov-21		Quarterly																			
	Dec-21																					
	Jan-22	20/01/22	1357008	54	<	0.05	1.2000	0.0041	0.0036	8.2	860.0	360.0	1.60	0.050	11.3	38.0	87.0	75.0	-	5.5		
	Feb-22		Quarterly																			
	Mar-22																					
	Apr-22	10/05/22	1430020	56	<	0.050	0.51	0.0030	0.0210	7.7	790.0	310.0	0.15	0.002	11.5	38.0	87.0	71.0	-	4.8		
	May-22		Quarterly																			
	Jun-22																					
	Jul-22	11/08/22	1487922	61	<	0.050	0.6400	0.0045	<	0.0025	7.6	900.0	290.0	0.18	0.002	11.8	58.0	130.0	78.0	8.0	74.0	
	Aug-22		Quarterly																			
	Sep-22																					
	Oct-22																					
	Nov-22																					
	Dec-22																					

Table B4
Groundwater monitoring results

Location	Month	Date	Test reference number	Redox Potential	Mercury, filtrate as Hg	Manganese in filtrate as Mn	Nickel in filtrate as Ni	Zinc, ultra-low filtered as Zn	pH	Electrical Conductivity 20C	Alkalinity as CaCO3	Ammoniacal Nitrogen as N	Unionised Ammoniacal Nitrogen ***	Measure water temperature	Chloride as Cl	Sulphate as SO4	Calcium	D.O. concentration	TOC (Filtered)			
				mV	ug/l	mg/l	mg/l	mg/l	pH units	uS/cm	mg/l	mg/l	mg/l	°C	mg/l	mg/l	mg/l	mg/l	mg/l			
			Trigger Level		(0.2 ^a)		0.05	(0.05 ^a)	--	--	--	1	--	--	250	400	--	--	--			
			Control Level A		(0.1 ^{aa})	--	0.03	(0.02 ^{aa})	--	--	--	0.8	--	--	210	300	--	--	--			
			Control Level B		(0.15 ^{aa})	--	0.04	(0.035 ^{aa})	--	--	--	0.9	--	--	230	350	--	--	--			
			Assessment Level		--	(1.0 ^a)	--	--	--	--	--	--	--	--	--	--	--	--	--			
SST East S2																						
	GW9	Jan-21	20/01/21	20069620	110	0.015	0.2920	0.0028	0.0050	6.6	376.0	129.0	5.85	0.0049	11.7	28.5	15.1	21.0	2.9	3.7		
		Feb-21		Quarterly																		
		Mar-21																				
		Apr-21	27/04/21	20384855	-170	0.10	0.6490	0.0046	0.0330	6.6	664.0	185.0	6.35	0.0054	11.8	49.9	24.9	N/S	2.5	5.6		
		May-21		Quarterly																		
		Jun-21																				
		Jul-21	27/07/21	20670061	-285	0.01	0.0347	0.0019	0.0087	7.3	926.0	317.0	7.90	0.0402	14.3	41.4	24.1	71.0	3.4	8.0		
		Aug-21		Quarterly																		
		Sep-21																				
		Oct-21	18/10/21	20977674	-307	0.04	0.9200	0.0035	0.0160	7.3	772.0	169.0	7.43	0.0378	12.7	67.4	28.6	45.0	1.8	4.7		
		Nov-21		Quarterly																		
		Dec-21																				
	GW10	Jan-22	20/01/22	1357009	66	<	0.05	1.1000	0.0055	0.0073	8.1	1200.0	240.0	9.30	0.2	11.7	120.0	39.0	50.0	-	6.1	
		Feb-22		Quarterly																		
		Mar-22																				
		Apr-22	10/05/22	1430021	68	<	0.05	0.35	0.0026	0.0073	7.2	550.0	220.0	4.70	0.016	12.4	38.0	34.0	23.0	-	2.9	
		May-22		Quarterly																		
		Jun-22																				
		Jul-22	11/08/22	1487923	67	0.05	0.6200	0.0038	0.0055	7.3	670.0	160.0	3.70	0.017	13.2	68.0	38.0	34.0	7.9	37.0		
		Aug-22		Quarterly																		
		Sep-22																				
		Oct-22																				
		Nov-22																				
Dec-22																						
SST East S3																						
	GW9	Jan-21	20/01/21	20069621	104	0.07	0.2140	0.0027	<	0.0050	6.8	254.0	124.0	<	0.41	0.0006	13.1	5.5	19.5	45.0	9.2	2.3
		Feb-21		Quarterly																		
		Mar-21																				
		Apr-21	27/04/21	20384856	-251	0.07	1.6800	0.0091	0.085	6.9	639.0	240.0	<	0.41	0.0006	10.1	27.1	41.1	N/S	2.9	7.0	
		May-21		Quarterly																		
		Jun-21																				
		Jul-21	27/07/21	20670062	-310	0.07	1.3500	0.0097	<	0.0050	7.1	480.0	191.0	<	0.41	0.0012	13.4	17.5	42.3	61.0	5.4	5.3
		Aug-21		Quarterly																		
		Sep-21																				
		Oct-21	18/10/21	20977675	-281	0.03	1.4800	0.0082	<	0.0050	7.7	439.0	181.0	<	0.41	0.0049	11.1	10.8	48.7	61	5.3	4.1
		Nov-21		Quarterly																		
		Dec-21																				
	GW10	Jan-22	20/01/22	1357010	71	<	0.05	0.8900	0.0061	0.0027	8.3	630.0	230.0	0.33	0.0123	10.6	21.0	49.0	61.0	-	5.2	
		Feb-22		Quarterly																		
		Mar-22																				
		Apr-22	10/05/22	1430022	74	<	0.05	5.5	0.0130	<	0.0025	7.4	630.0	240.0	0.52	0.0027	11.3	31.0	59.0	52.0	-	6.0
		May-22		Quarterly																		
		Jun-22																				
		Jul-22	11/08/22	1487924	60	<	0.05	4.0000	0.0130	0.0033	7.3	580.0	240.0	0.77	0.0033	12.1	28.0	56.0	55.0	7.8	54.0	
		Aug-22		Quarterly																		
		Sep-22																				
		Oct-22																				
		Nov-22																				
Dec-22																						

Exceedance of Control Level

Exceedance of Trigger Level

Exceedance of Assessment Level

Notes

* The redox potential was not measured on site and there is a possibility that it has changed between sampling and analysis{*/}

** Unionised ammoniacal nitrogen based on measured Temperature and pH; unionised ammoniacal nitrogen = total ammonia/(1+10^{(10.055-(0.0324*°C)-pH)}), where T°C is measured water temperature.

^ Ammonia result confirmed on duplicate analysis.

Table B5
Landfill Gas Monitoring Results

[illegible]

Table B5
Landfill Gas Monitoring Results

METHANE (% by Volume)														CARBON DIOXIDE (% by Volume)													
Location	Valve	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	Sep-22	Oct-22	Nov-22	Dec-22	Comments	
GMW7	Yellow Valve	0	0	0	0	0	0	0	0	0				0.3	0.2	0.1	0	0.9	0.8	2.2	0.9	0.4				Yellow Valve,12 depth	
	White Valve	0	0	0	0	0	ap broke	0	0	0				0.3	0	0	0.1	1	ap broke	2.2	0.9	0				White Valve, 5m depth	
	Trigger Levels	1	1	1	1	1	1	1	1	1	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-	Trigger Levels	
	Control Levels	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	-	-	-	-	-	-	-	-	-	-	-	-	Control Levels	
	Trigger Level Yellow	-	-	-	-	-	-	-	-	-	-	-	-	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	Trigger Level Yellow	
	Trigger Level White	-	-	-	-	-	-	-	-	-	-	-	-	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	1.82	Trigger Level White	
	Control Level Yellow	-	-	-	-	-	-	-	-	-	-	-	-	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	Control Level Yellow	
	Control Level White	-	-	-	-	-	-	-	-	-	-	-	-	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	1.32	Control Level White	
GMW12	Red Valve	0	0	0	0	0	0	0	0	ntc				1.2	0	0	2	0.9	1.1	1	0.4	ntc				Red Valve, 26.3m depth	
	Yellow Valve	0	0	0	0	0	0	0	0	ntc				0.7	0	2.7	1.5	1	2.6	1	0.6	ntc				Yellow Valve,15m depth	
	White Valve	0	0	0	0	0	0	0	0	ntc				0.9	0	1	2.1	1	1	1.1	0.2	ntc				White Valve, 5m depth	
	Trigger Level Red	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	1.89	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	Trigger Level Red	
	Trigger Level Yellow	1	1	1	1	1	1	1	1	1	1	1	1	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	Trigger Level Yellow	
	Trigger Level White	1	1	1	1	1	1	1	1	1	1	1	1	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	Trigger Level White	
	Control Level Red	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	4	4	4	4	4	4	4	4	4	4	4	4	Control Level Red	
	Control Level Yellow	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	Control Level Yellow	
GMW13	Control Level White	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5	5	5	5	5	5	5	5	5	5	5	5	Control Level White	
	Red Valve	0	0	0	0	0	0	0	0	0				1.2	1.2	1.3	1.1	1.5	1.3	2.1	1.6	1.4				Red Valve, 26.3m depth	
	Yellow Valve	0.1	0.1	0.1	0.1	0	0.1	0	0.1	0.1				4.5	4.4	4.8	4.5	4	4.9	6.7	5.6	5.1				Yellow Valve,15m depth	
	White Valve	0	0	0	0	0	0	0	0.1	0				3.9	4	4	3	4.1	3.5	4.6	3.8	3.2				White Valve, 5m depth	
	Trigger Level Red	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	1.14	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	Trigger Level Red	
	Trigger Level Yellow	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	6	6	6	6	6	6	6	6	6	6	6	6	Trigger Level Yellow	
	Trigger Level White	1	1	1	1	1	1	1	1	1	1	1	1	5.82	5.82	5.82	5.82	5.82	5.82	5.82	5.82	5.82	5.82	5.82	5.82	Trigger Level White	
	Control Level Red	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	0.64	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	Control Level Red	
GMW14/14A	Control Level Yellow	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	Control Level Yellow	
	Control Level White	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	5.32	Control Level White	
	Red Valve	0	0	0	0	0	0	0	0	0				4.6	4.9	2.8	2.8	3.2	1.9	3.2	2.5	4.2				Red Valve, 26.3m depth	
	Yellow Valve	0	0	0	0	0	0	0	0	0				5.9	6.5	6.4	6.2	6.1	7.1	5	6	8				Yellow Valve,15m depth	
	White Valve	0	0	0	0	0	0	0	0	0				6.7	6.5	6.5	6.1	6.1	3.1	2.5	2.5	5.4				White Valve, 5m depth	
	Trigger Level Red	1	1	1	1	1	1	1	1	1	1	1	1	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	Trigger Level Red	
	Trigger Level Yellow	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9	Trigger Level Yellow	
	Trigger Level White	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	Trigger Level White	
GMW1**	Control Level Red	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1	1	1	1	1	1	1	1	Control Level Red	
	Control Level Yellow	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	5.4	Control Level Yellow	
	Control Level White	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	4.9	Control Level White	
	Red Valve	1.7	0.1	nt	0.9	0.5	2.2	2.4	1.5	2.1				2.4	0.3	nt	2.2	2.5	1.9	7.8	5	2.7				Red Valve, 23.5m depth	
GMW8*	Yellow Valve	0	17.3	nt	0	7.5	9.1	5.7	5.1	29.4				0	5.1	nt	0	4.2	10.9	11.5	10.7	11.6				Yellow Valve,14.7m depth	
	White Valve	0	0	nt	0.2	0	0	0.1	0	0.2				0	0	nt	0.6	0	2.4	0.8	1	0.8				White Valve, 6.5m depth	
	Yellow Valve	6.6	6.8	6.8	4	6.5	1.8	3.2	4.9	1.4				7.7	7.8	7.7	4.7	12	3.3	9.9	8	3.3				Yellow Valve,17.5m depth	
GMW9*	White Valve	0	0	0	0	0	0	0	0.1	0				4.7	5	4.5	4.3	3.9	2.8	5.8	5.2	4.3				White Valve, 5.7m depth	
	Red Valve	0	0	0	0	0	0	0	0	0				2	2	2.1	1.9	0.6	1.8	2.7	2	1.8				Red Valve, 27m depth	
	Yellow Valve	20.2	18.3	18.5	17.4	20	11.7	9.9	12.1	14.2				8.4	8.8	8.3	9	10.4	10.3	9.5	10.1	10.5				Yellow Valve,15m depth	
GMW10*	White Valve	0	0	0	0	0.1	0	0	0.1	0				0.1	0.1	0.1	0.1	0.2	0.1	1	0.3	4.2				White Valve, 8.5m depth	
	Red Valve	0	0	20.4	0	0	20.7	16.5	12	30.3				4.4	4.2	5.1	6.3	6.5	7.9	13.1	15	9.4				Red Valve, 19.5m depth	
	Yellow Valve	14.5	7	29.2	9.6	8.6	6.8	11.7	11.1	38.4				2.4	1.3	4.7	2	5.6	1.5	13.3	13	9.2				Yellow Valve,15m depth	
GMW17**	White Valve	0	0	17.7	1.2	0	16.7	0	0	29.4				4.7	4.1	5	6.6	5.7	8.1	10	4.3	9.4				White Valve, 8m depth	
	Red Valve	0	0	0	0	0	0	0	0	0				1.6	1.5	1.6	1.4	1.1	1.2	1.4	1.3	1.4				Red Valve, 26.3m depth	
	Yellow Valve	0	0	0	0	0	0	0	0	0				5.9	5.3	5.3	4	4.2	3.8	3.8	3.4	4.7				Yellow Valve,15m depth	
GMW18**	White Valve	0	0	0	0	0	0	0	0	0				3.3	4.6	4	4.2	4.5	3.9	4.3	3.4	2.6				White Valve, 5m depth	
	Yellow Valve	0	0	0	0	0	0	0	0	0				0.1	1.6	0.1	1.7	0	2.3	1.6	2.2	2.1				Yellow Valve,12 depth	
GMW18**	White Valve	0	0	0	0	0	0	0.1	0	0				6	5.3	5.1	4.1	7.9	3.7	4.3	4.2	3.7				White Valve, 5m depth	

Notes:
1. Water denotes 'water in well - reading abandoned'.
2. NT denotes 'reading not taken'.
3. NT in GMW14 is due to cattle quarantine paddock around well location.
4. Where the asterisc (*) is present, no trigger levels have been set, as high levels of methane and carbon dioxide gas are recorded. This is likely to be associated with the presence of bog/marshland.
5. Where two asterisks (**) are present, no trigger levels have been set, as not require by the Permit (Reference [2]).
ntc - reading not taken due to cattle presence at location of the well

	Exceedance of Trigger
	Exceedance of Control