

Silent Valley Waste Services Limited

Silent Valley Landfill

2022 First Quarter Monitoring Report

Reference: Issue

Issue 01 | 29 April 2022



This report takes into account the particular instructions and requirements of our client. It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

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1. Introduction

This 2022 First 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 January to March 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 2020 Annual 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, February recorded the highest monthly rainfall of the quarter (229.9mm) and the highest daily rainfall total (34.3mm on 20th February). February's monthly rainfall total has been the highest on record since reporting began in 2008. January recorded the lowest monthly rainfall of the quarter (57.2mm) and March recorded 12 consecutive days of no rain from the 17th - 28th March inclusive.

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**.

All AMC average concentrations for the site remain compliant this quarter. Most of the well concentrations this quarter remain compliant with exceptions identified below. Note. LC5A also remains damaged.

LC2A continues to exceed AMC well concentration for Nickel at 0.12mg/l. This exceedance has been recorded through late 2020 and continuously throughout 2021 (see Annual Reports 2020^[3] and 2021^[4]).

LC2A remains elevated above AMC well concentration for Ammoniacal Nitrogen at 860mg/l. Historically Ammoniacal Nitrogen readings have been known to fluctuate in this well and are elevated over the previous quarter. The ammoniacal nitrogen and nickel concentration exceedances were discussed in the LC2A Technical Note appended to the 2021 Annual report ^[4].

LC2A Zinc levels have dropped below the AMC well concentration for the first time since the third quarter of 2020 and have been on the decrease throughout 2021.

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 therefore works are ongoing to replace this well in the near future.

2.2.2 Leachate Level Monitoring

Leachate 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 Quality

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.

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 exception of unionised ammoniacal nitrogen with exceedances of 0.0304mg/l in SWD and 0.0353 mg/l in SWD1. Unionised ammoniacal nitrogen did not exceed throughout 2020 or 2021 nor has it approached these levels historically. It is noted that this quarter 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 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.

2.4.1.1 Upstream Groundwater Wells

Well GW3A and GW4

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

Mercury concentrations have dropped below the Trigger and Control Level to <0.05ug/l in GW3A. Concentrations had exceeded Trigger Level for all of 2021 and have significantly dropped this quarter. These will be accessed again in the next quarter to further understand the trend.

Manganese continues to exceed the Assessment Level in GW4 with continued fluctuations over the years whilst showing no recognisable trend. Manganese has exceeded the 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 considered to be impacting the groundwater in the locale of the landfill.

Ammoniacal Nitrogen levels have spiked above Trigger Level this quarter in both wells with readings of 7.4mg/l (GW3A) and 4.3mg/l (GW4). These are significant exceedances as levels have remained compliant throughout all of 2021. This result will be investigated as stated previously for SWD and SWD1.

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 2020 and 2021. This compliance continues into 2022.

Well GW10

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

GW10 is fully compliant this quarter. This is the first time GW10 has been compliant since March 2021 following due to manganese exceedances.

Well GW9

GW9 has been 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 level of 9.3mg/l. The levels for Ammoniacal Nitrogen have been increasing since the first quarter of 2021, but this contaminant has been shown to fluctuate.

Manganese levels have exceeded the Assessment Level for the first time after remaining compliant throughout 2021, a concentration of 1.1mg/l has been recorded.

Well GW12

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

Levels of Mercury have decreased below Control Level from last quarter and the well is now compliant.

Wells GW6 and GW7

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

The Manganese concentration in GW7 has been recorded as 1.2mg/l. Generally, Manganese has exceeded Assessment Level since the third quarter of 2021 but has historically been known to fluctuate within this well, and it is considered that the concentrations are also impacted by the upstream groundwater.

Ammoniacal Nitrogen has exceeded Trigger Levels in both wells with levels of 3mg/l (GW6) and 1.6mg/l (GW7) for the first time after remaining compliant all of 2021. The investigation into whether this is a function of lab error (due to recent change in laboratory) or related to the landfill is ongoing.

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

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.

Carbon Dioxide

There were a number of exceedances throughout this quarter exceeding both Control and Trigger Levels. Wells which remained non-complaint include GMW3, GMW5, GMW6, and GMW14/14A.

- GMW3 Yellow Valve for January (3.8%) and February (3.9%) exceeding Trigger Levels of 2.67%. These levels have increased from last quarter but fluctuated throughout 2021.
- GMW5 White Valve for January (4.6%) and February (4.4%) exceeding Control Levels of 4.3%. These are the first exceedances in the well after remaining compliant in 2021.
- GMW6 Red Valve for January (4.2%) and February (4.2%) exceeding Control Levels of 3.8%. Levels significantly exceeded Trigger Levels from June to November 2021 and were compliant in December 2021. These levels are fluctuating with no clear trend.
- GMW14/14A consecutive concentration exceedances were recorded in 2020 and fluctuations throughout 2021. This quarter continue to exceed in the below levels;
 - Red Valve January (4.6%), February (4.9%) and March (2.8%) exceeding Trigger Levels of 1.5%.
 - Yellow Valve January (5.9%) for Control Level of 5.4%, February (6.5) and March (6.4%) for Trigger levels of 5.9%
 - White Valve January (6.7%), February (6.5%) and March (6.5%) exceeding Trigger Levels 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 first quarterly report noted the following:

- LC2A continues to exceed for AMC well concentration, however, remains compliant for the average AMC levels for the site. It has been concluded there is no significant threat to the surrounding site area with these well exceedances.
- Ammoniacal nitrogen has been encountered at much higher levels than previously in both surface water groundwater this quarter. We are currently investigating whether this is a lab error (due to recent change in laboratory), or an issue with the landfill.
- GMW6 recorded elevated carbon dioxide concentrations this quarter after reducing below the Control Level in December 2021, concentrations reduced again in March 2022. 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, 2020 Annual Monitoring Report, 30th January 2021.
- [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 (January 2015 - March 2022)

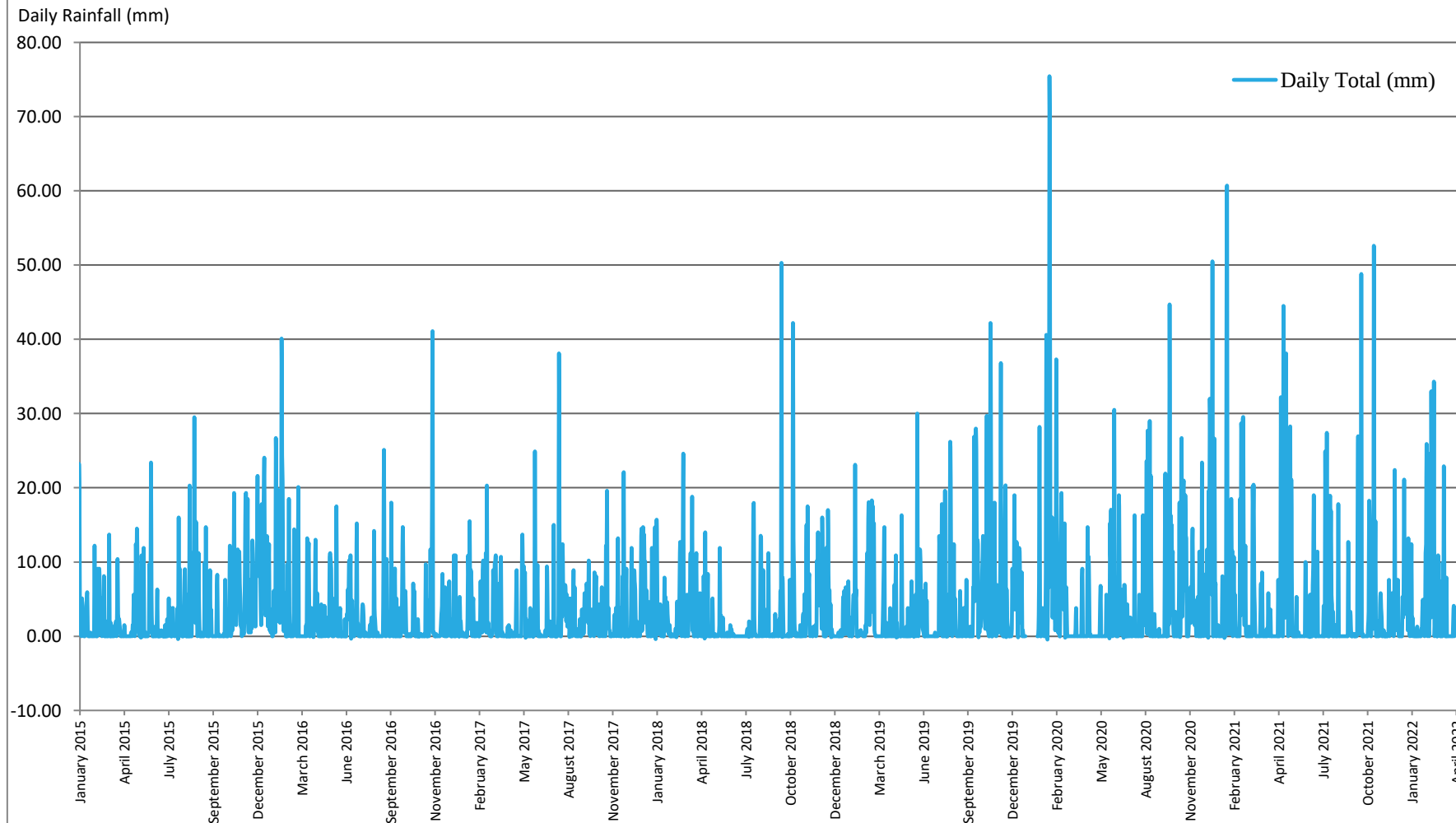
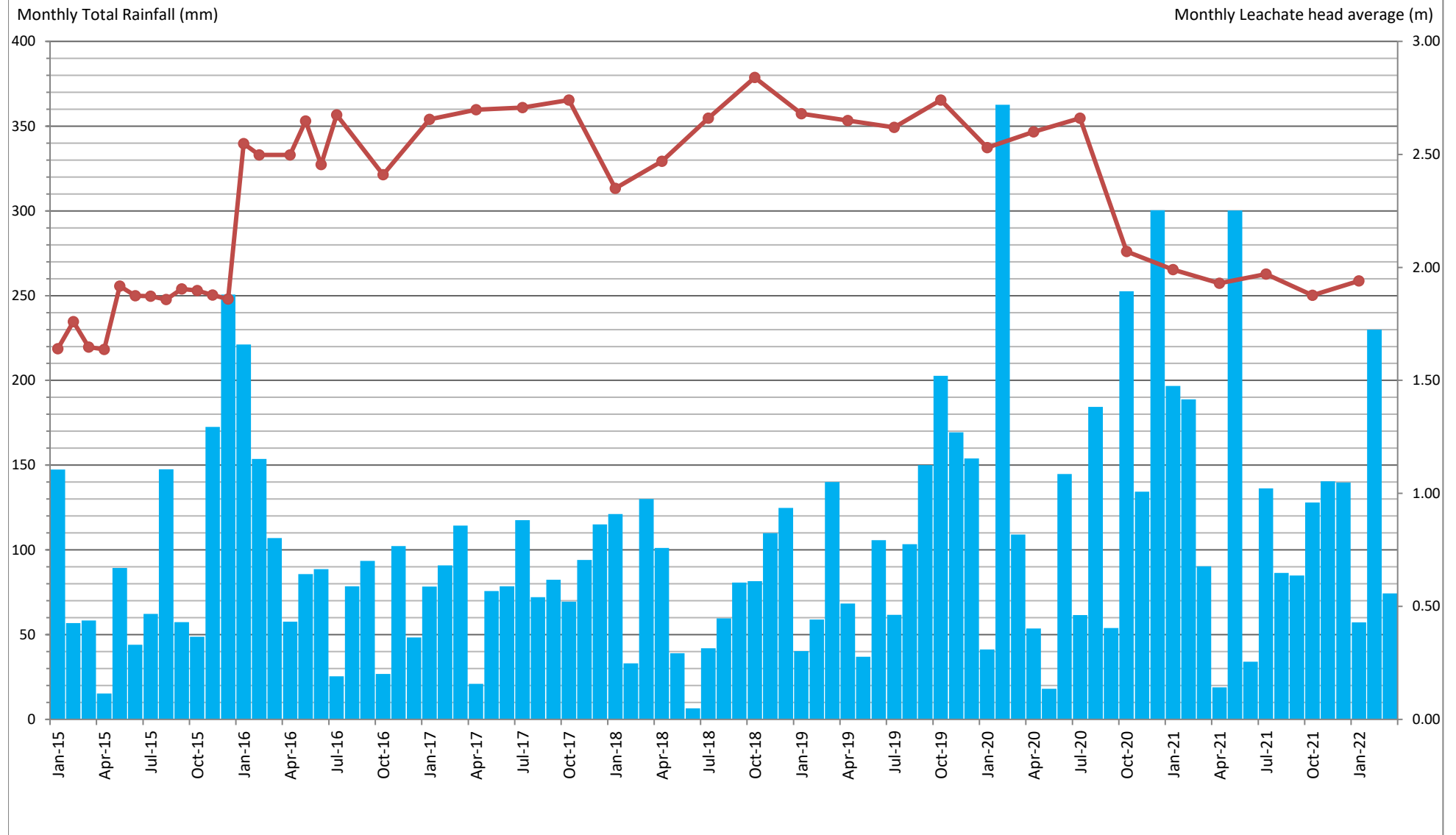


Figure A2
Monthly rainfall totals (January 2015 - March 2022)



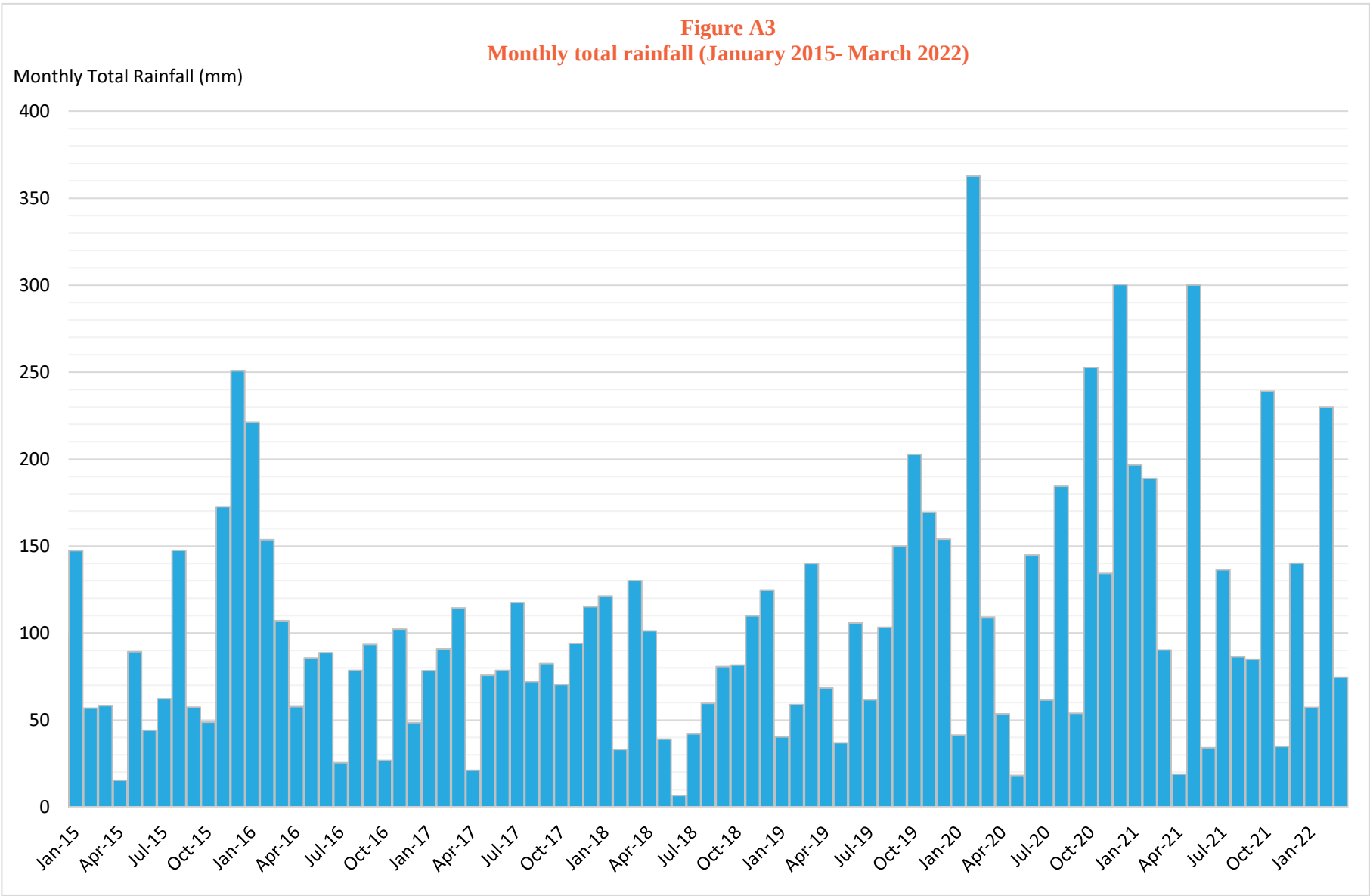


Figure A4
Surface water monitoring graphs

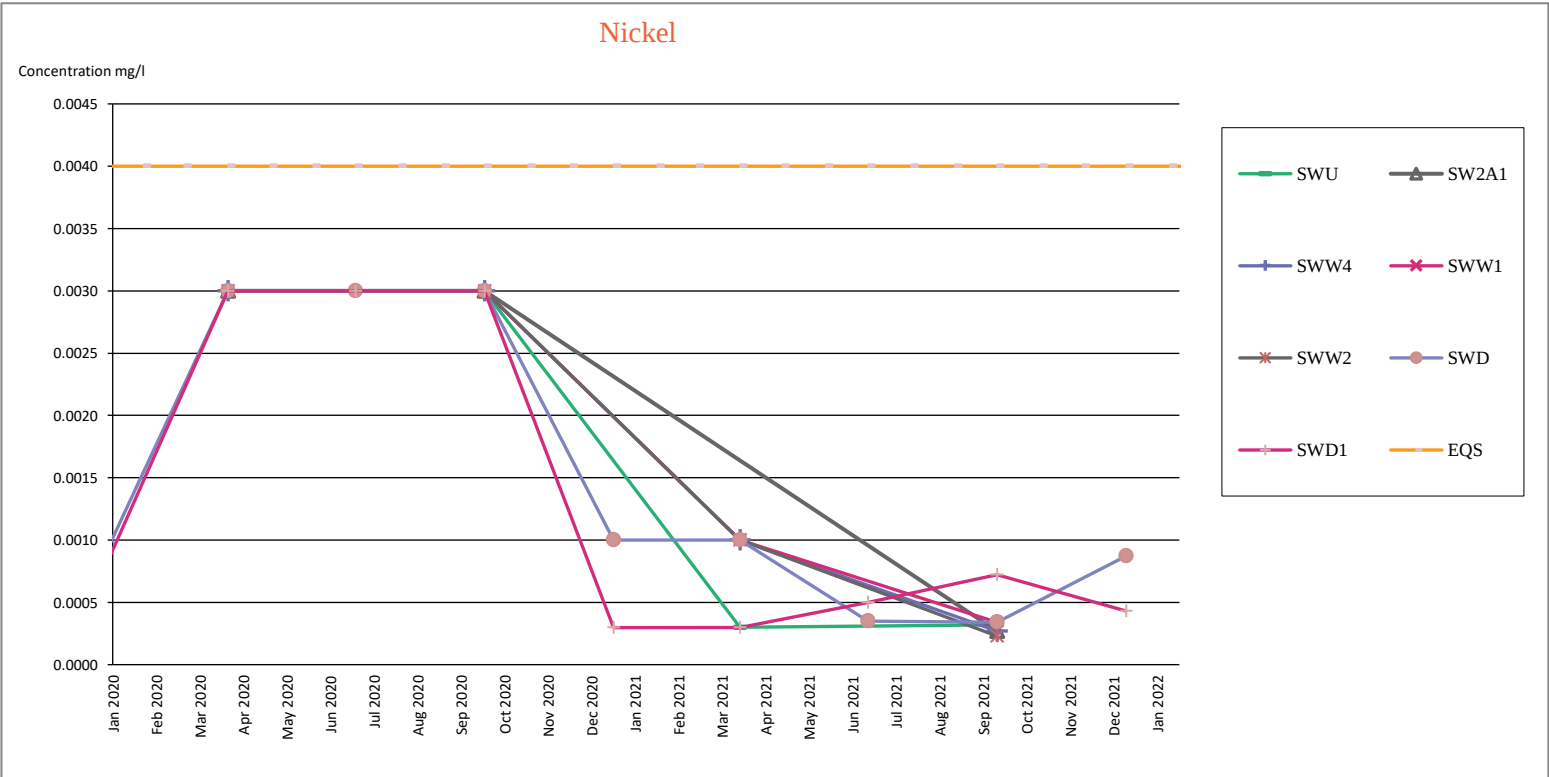
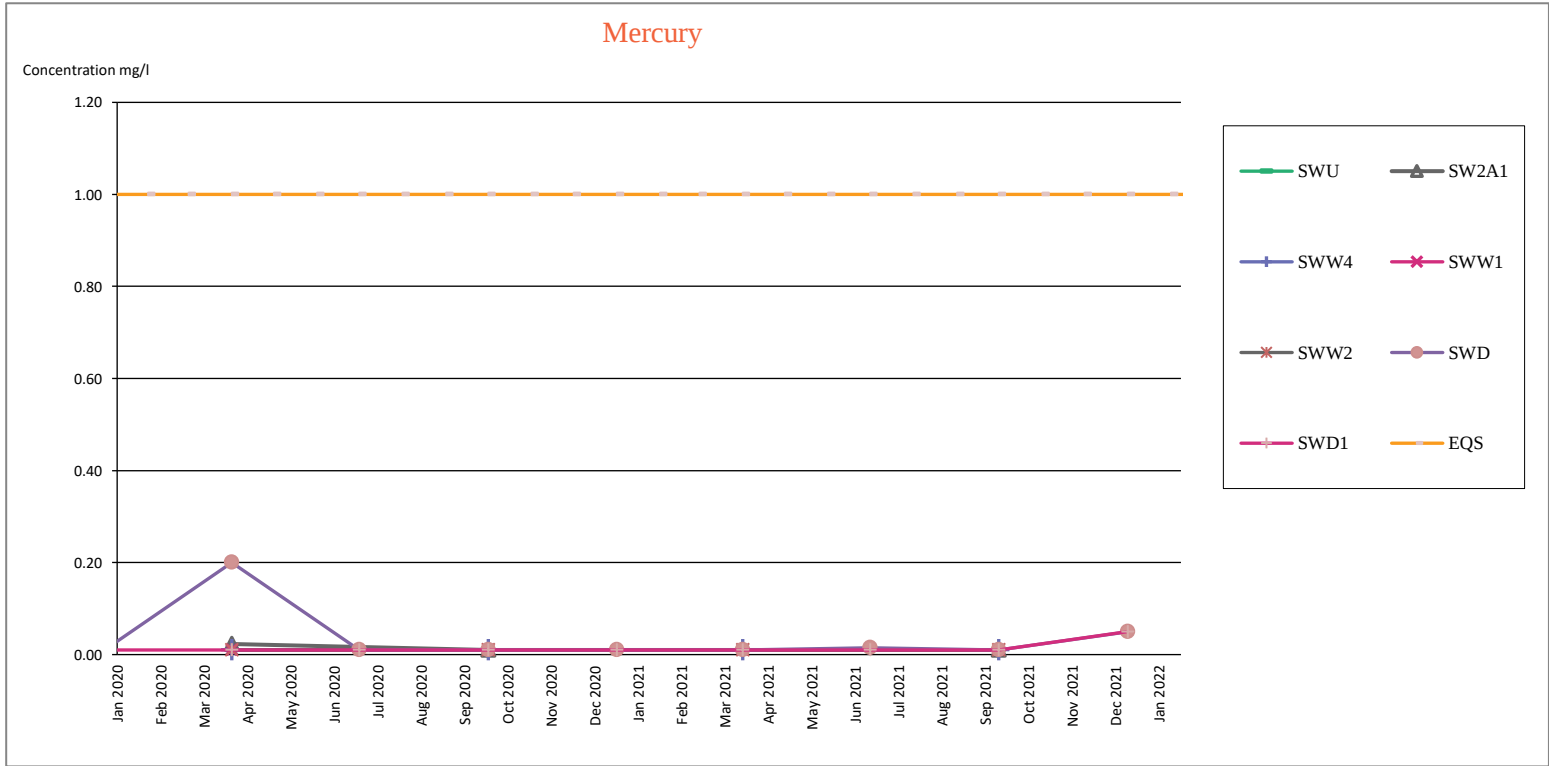
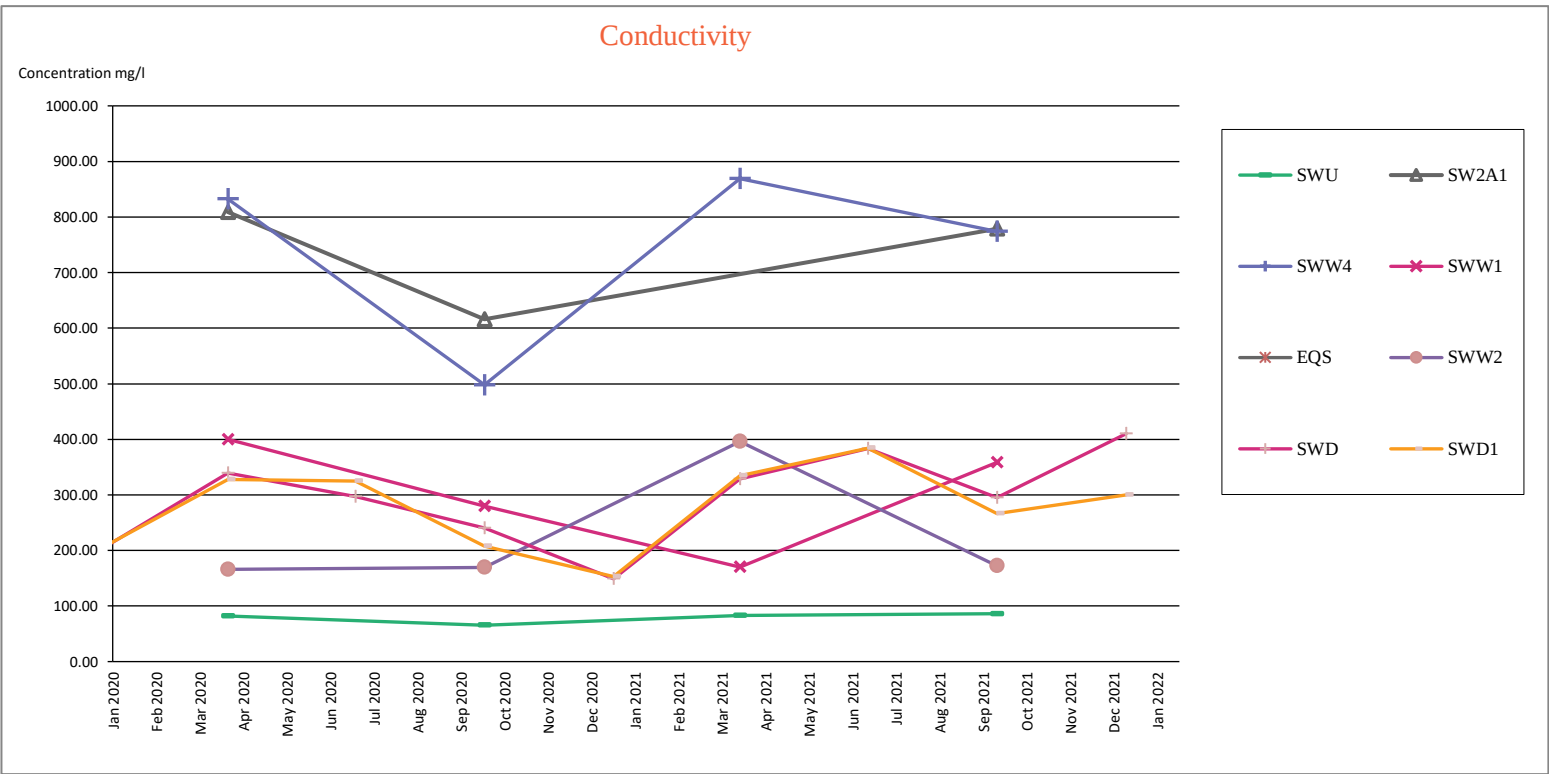
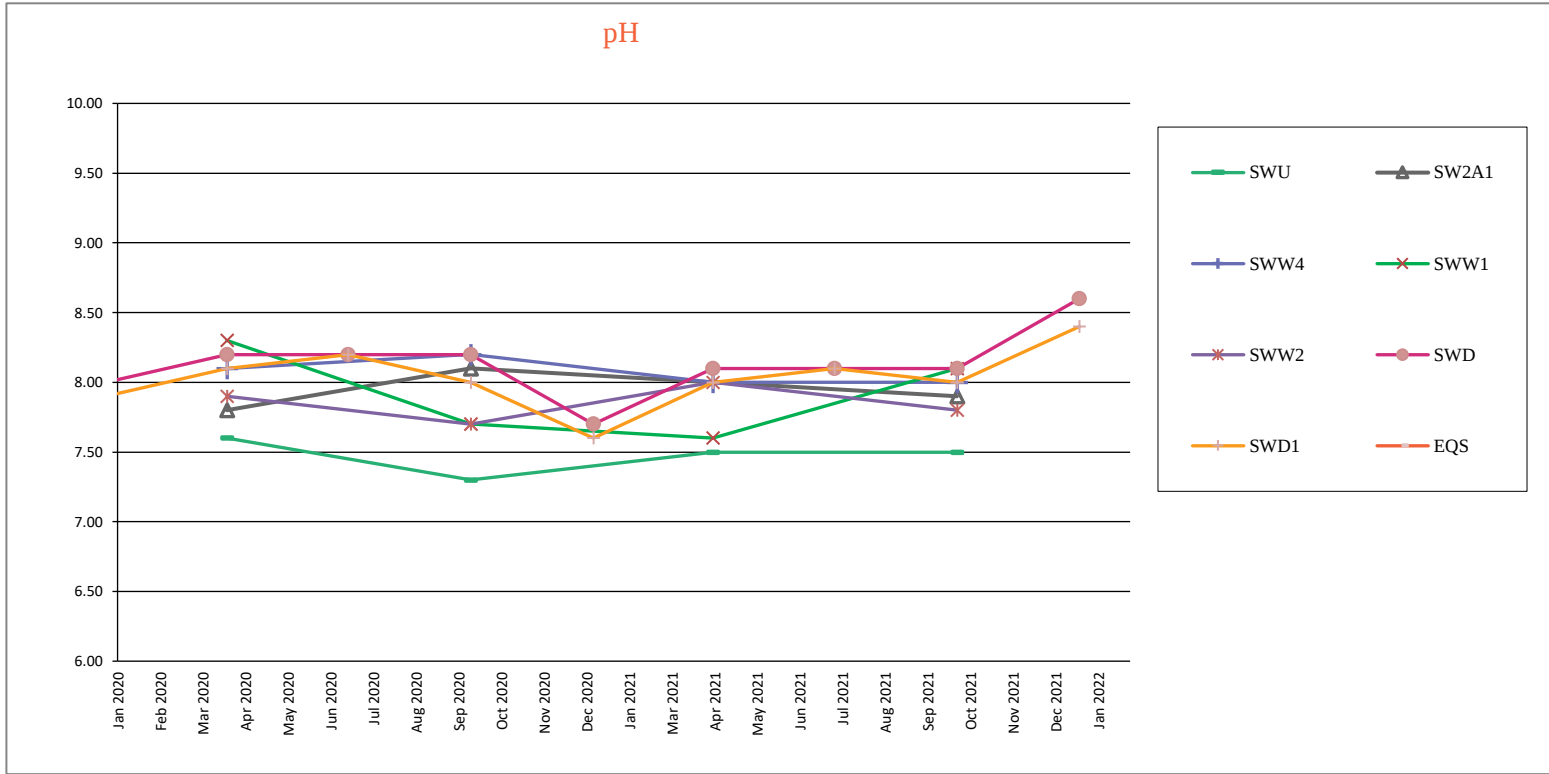


Figure A4
Surface water monitoring graphs

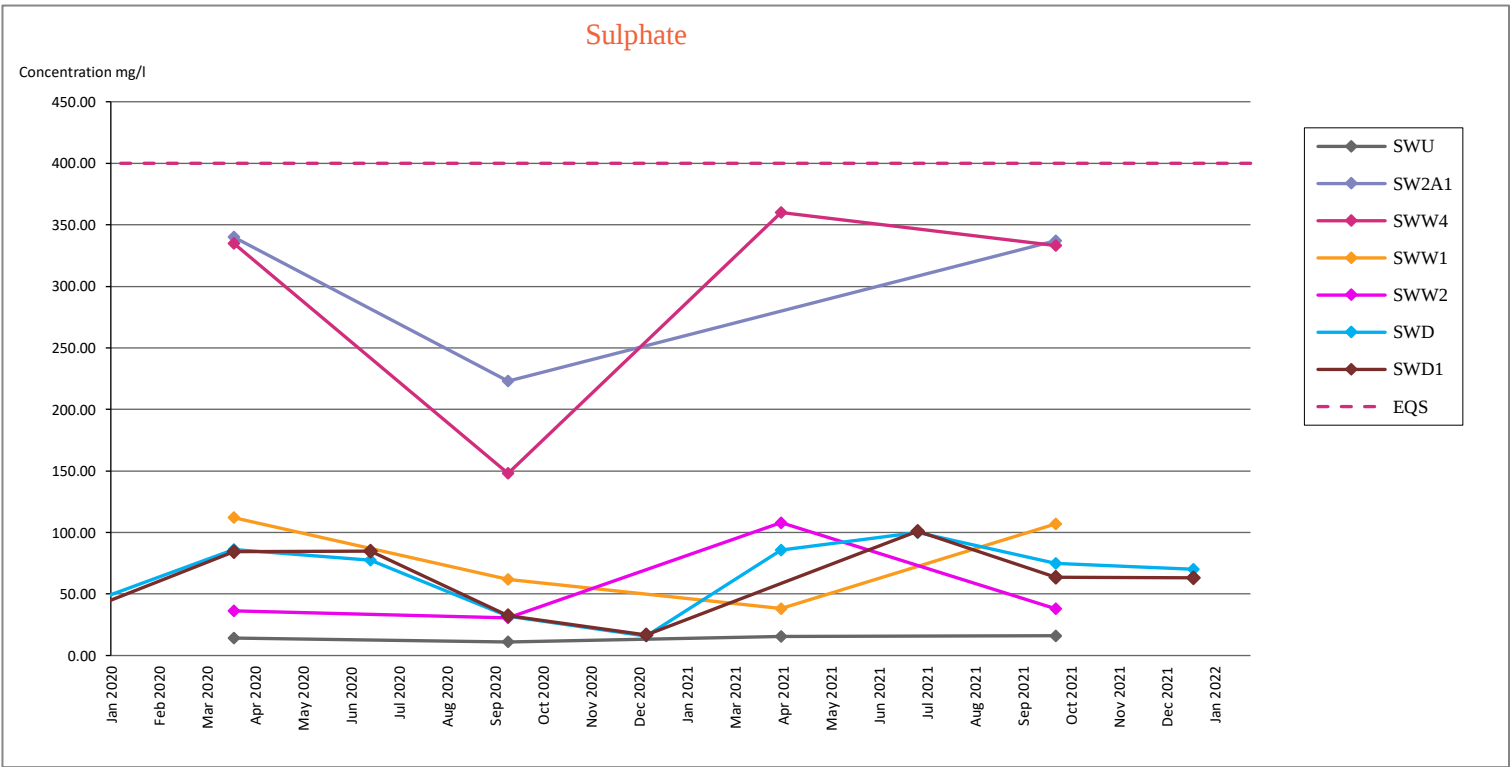
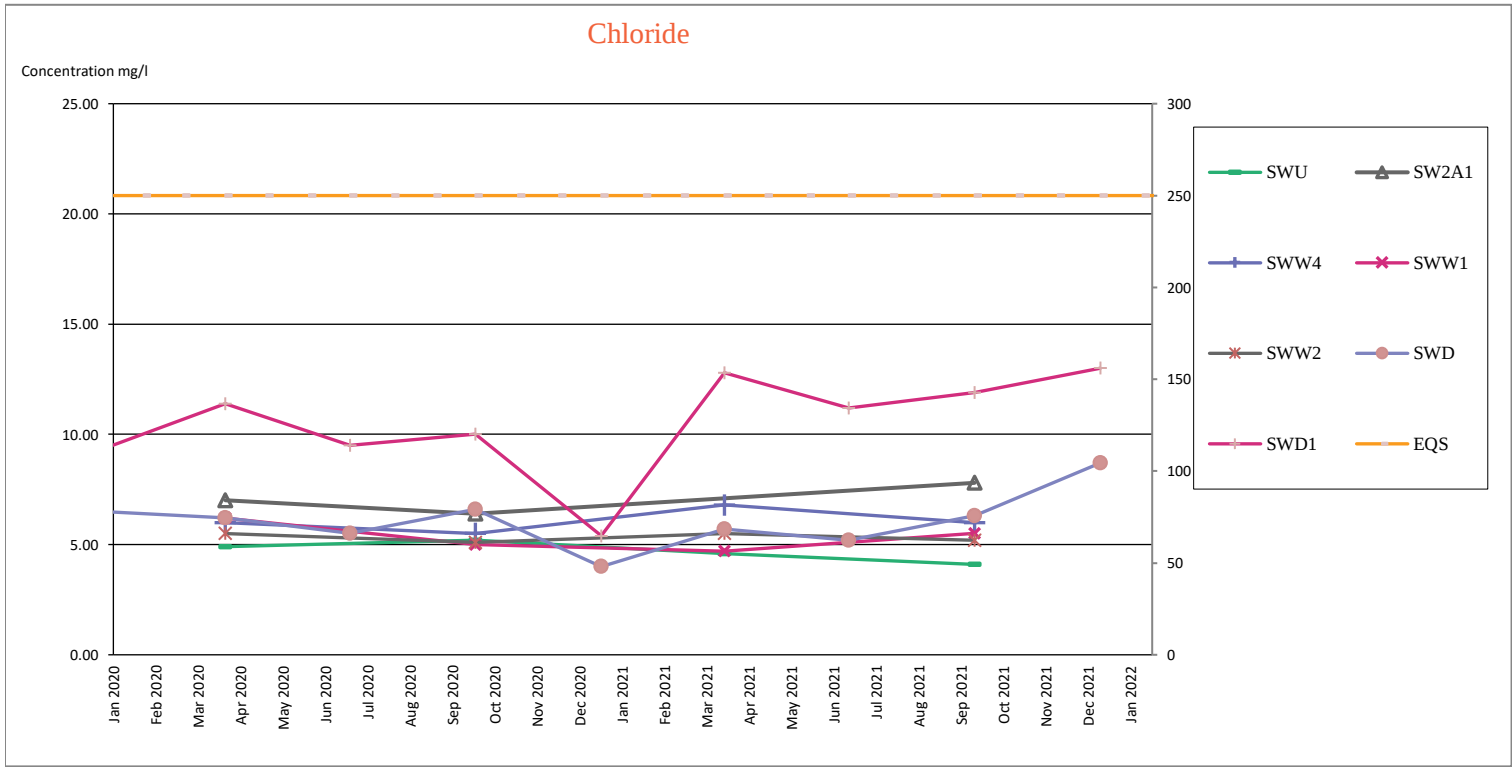
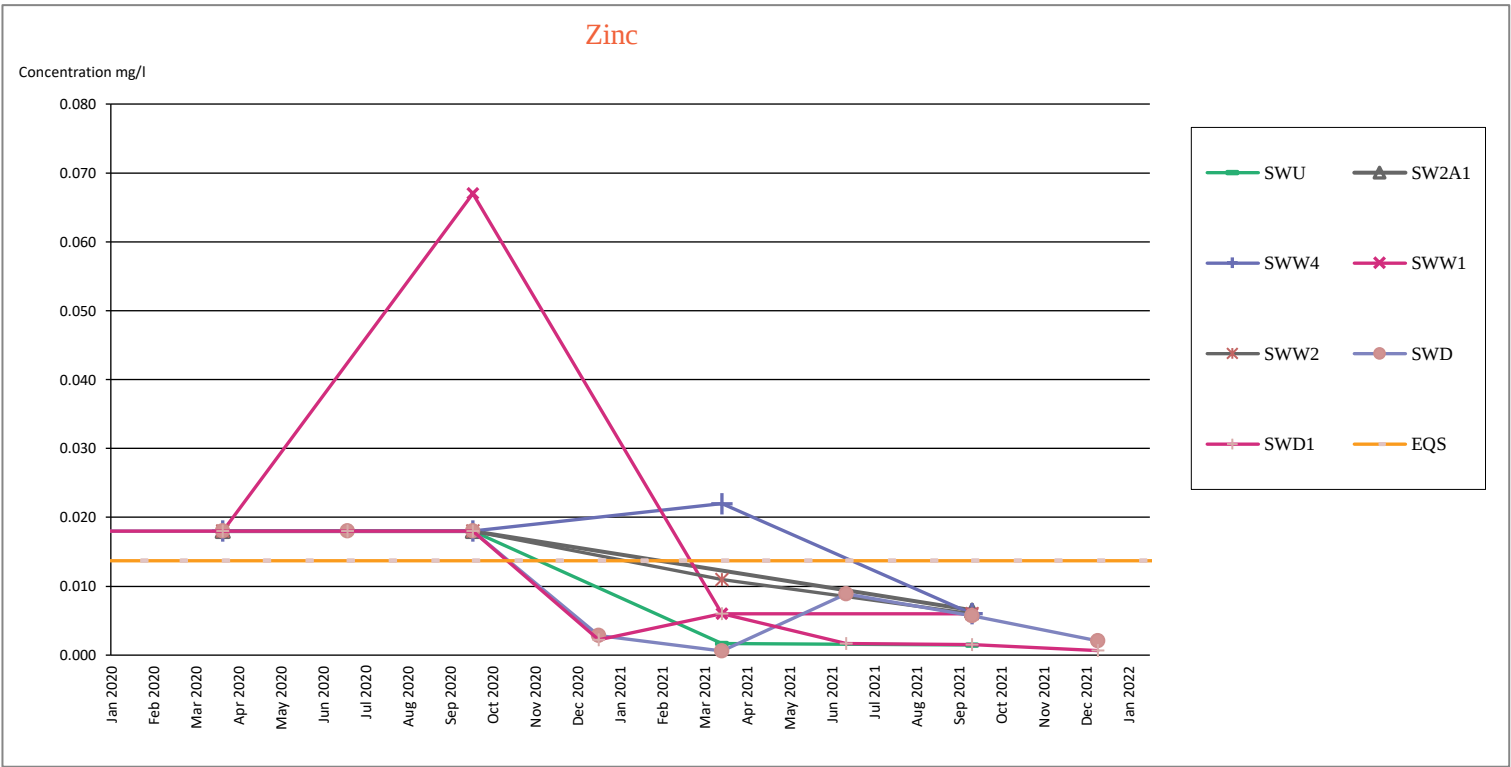
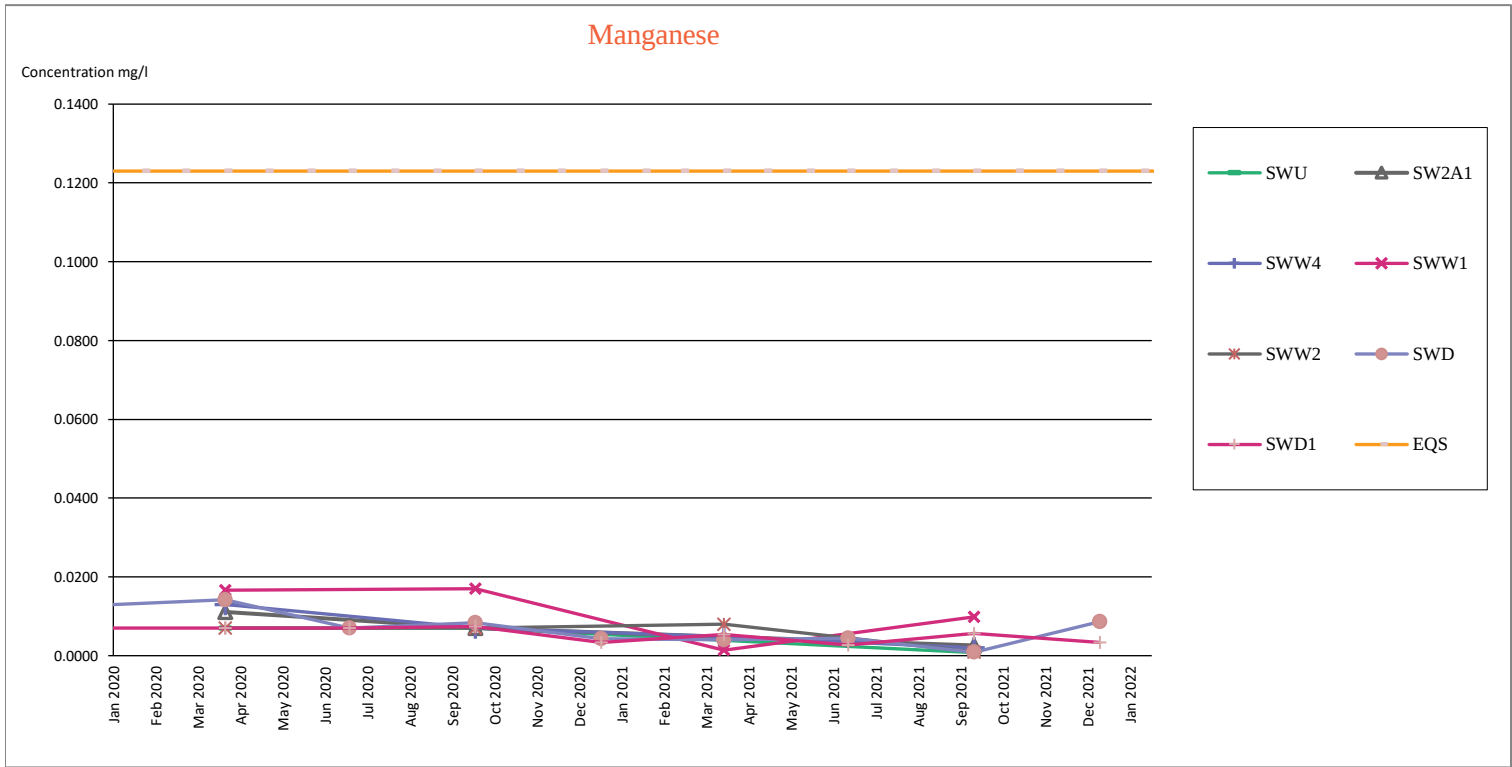


Figure A4
Surface water monitoring graphs

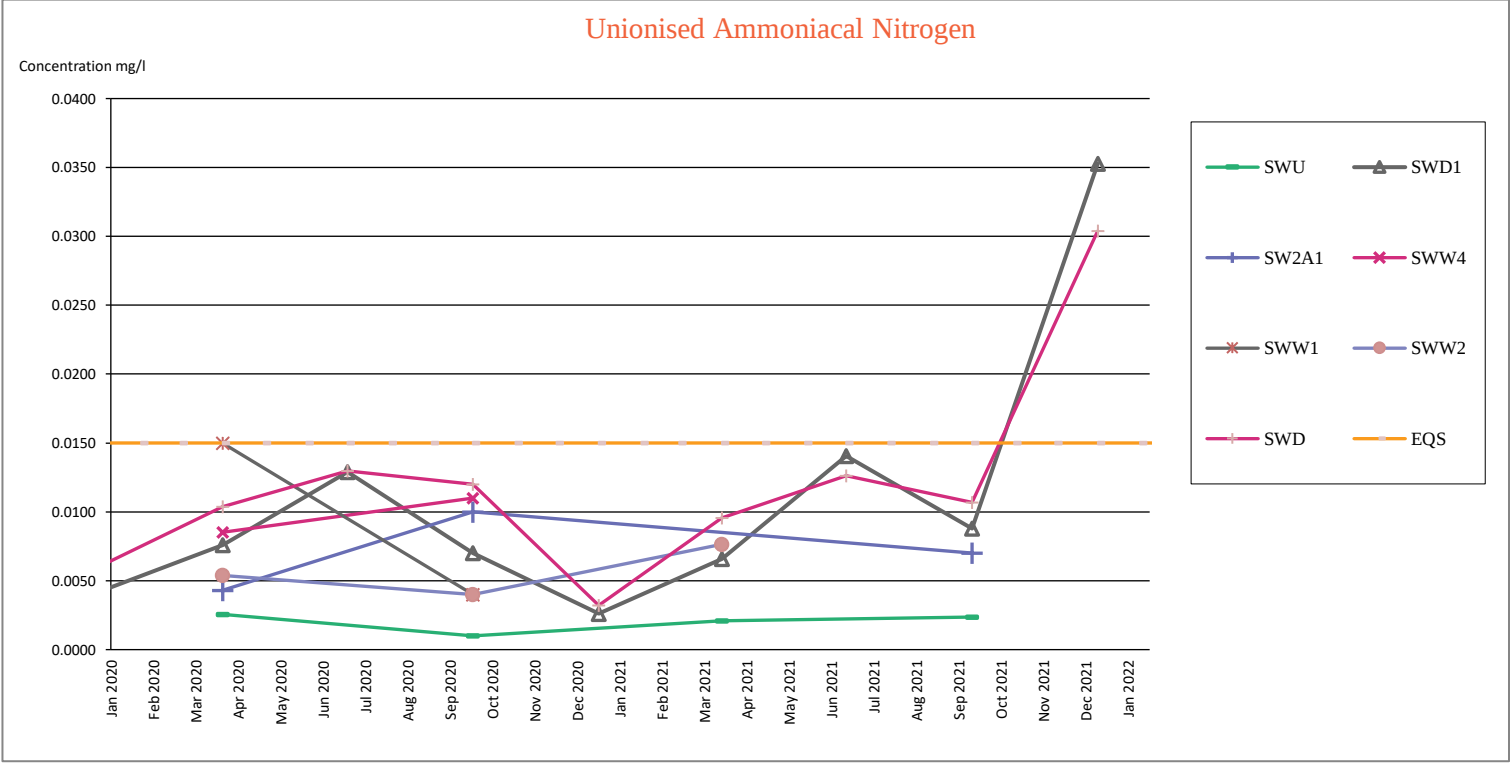
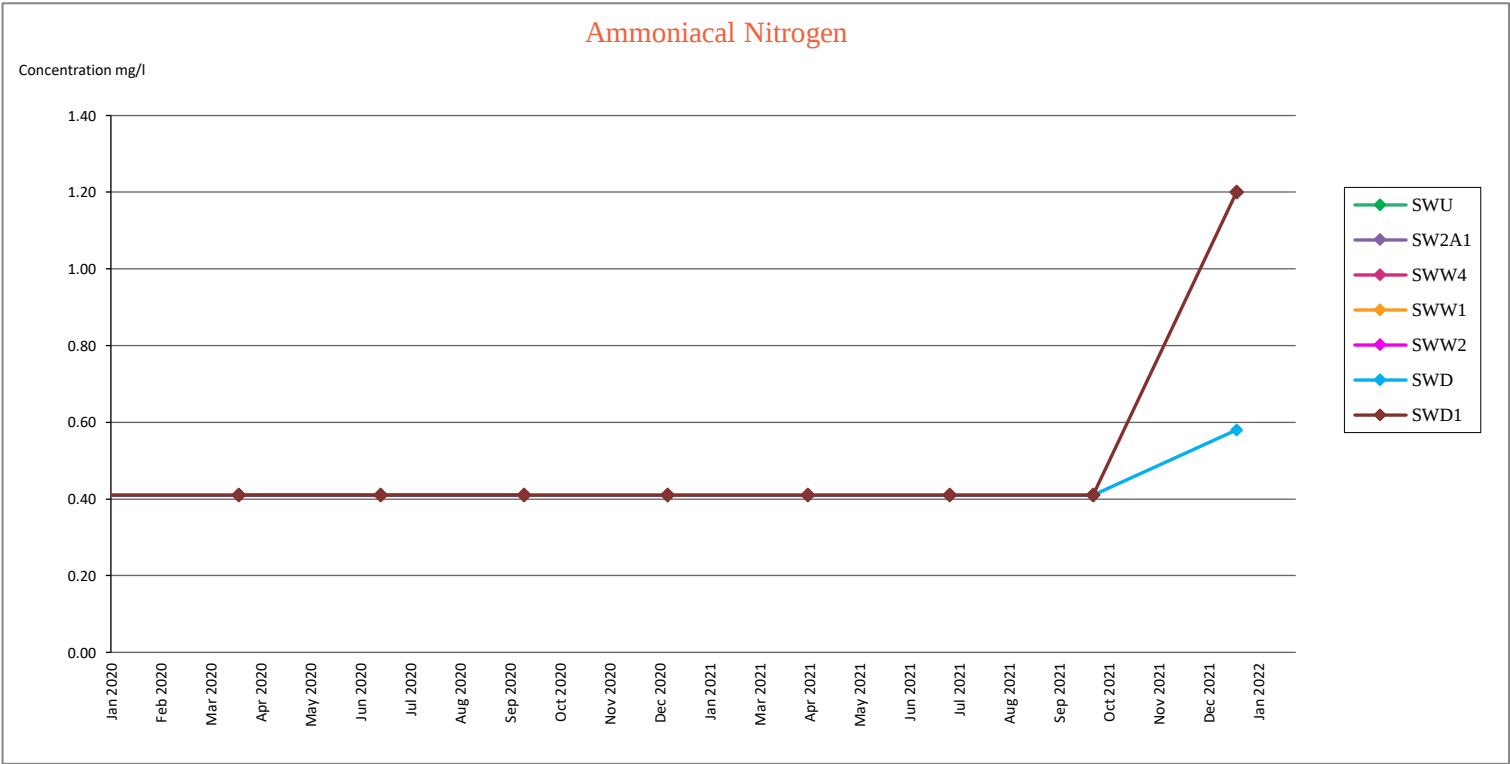


Figure A5
Groundwater quality monitoring results - Compliance wells graphs

Compliance wells graphs

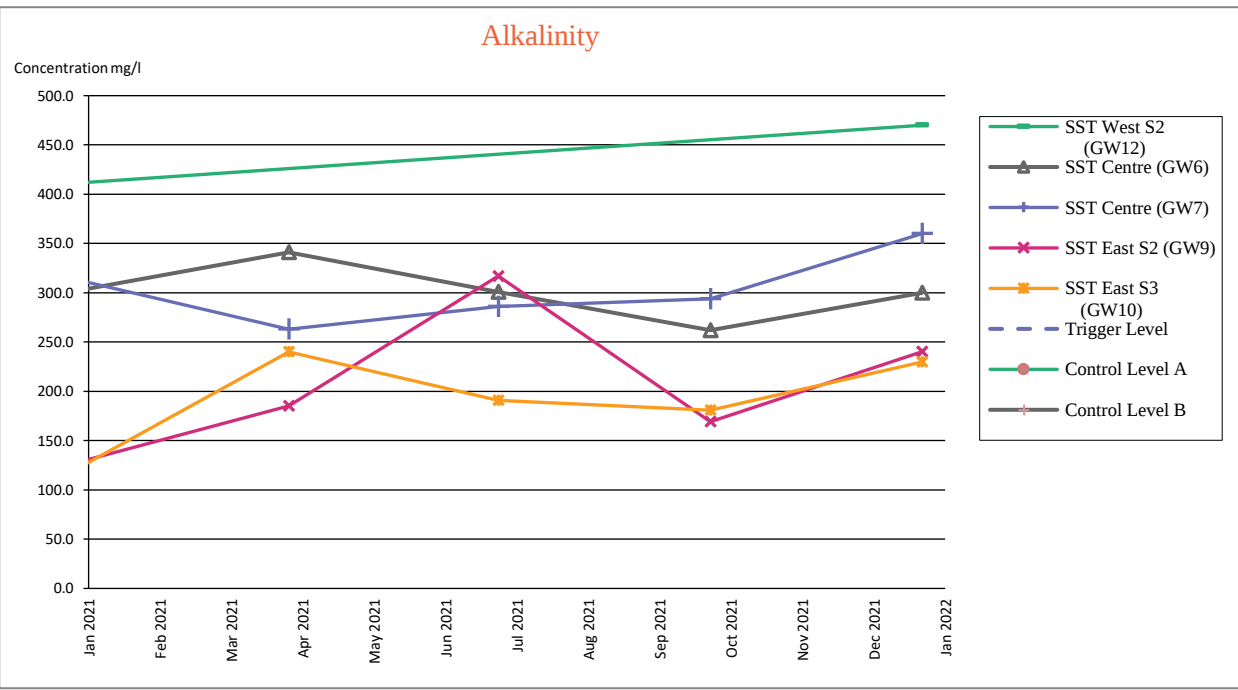
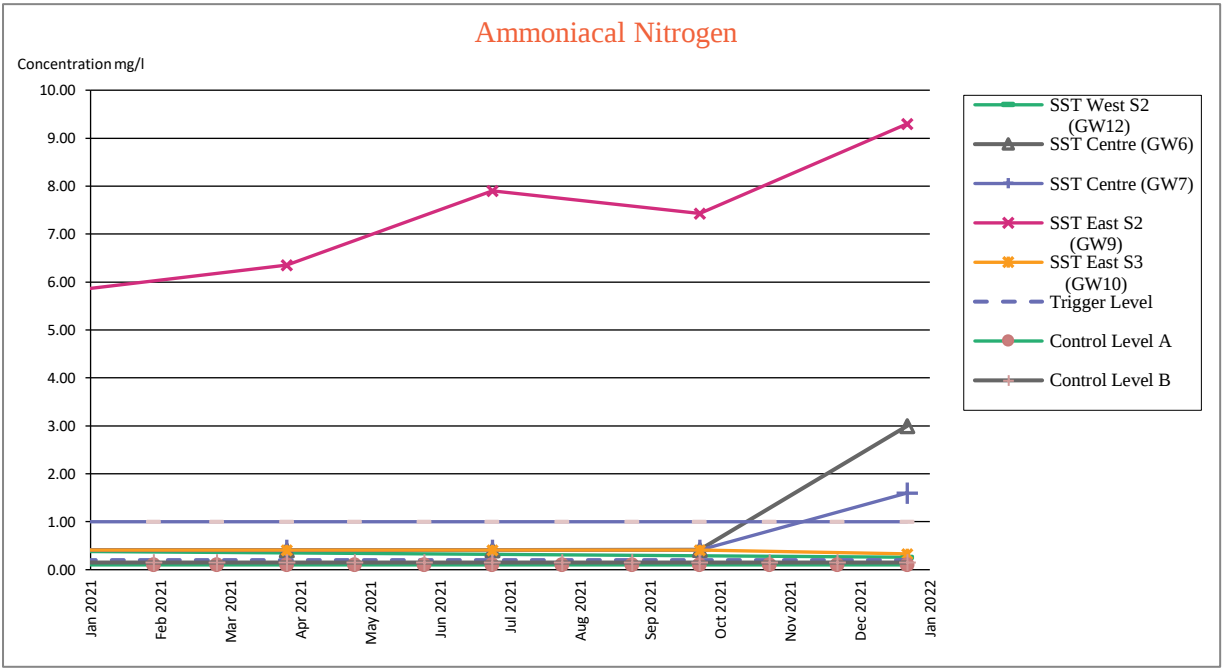
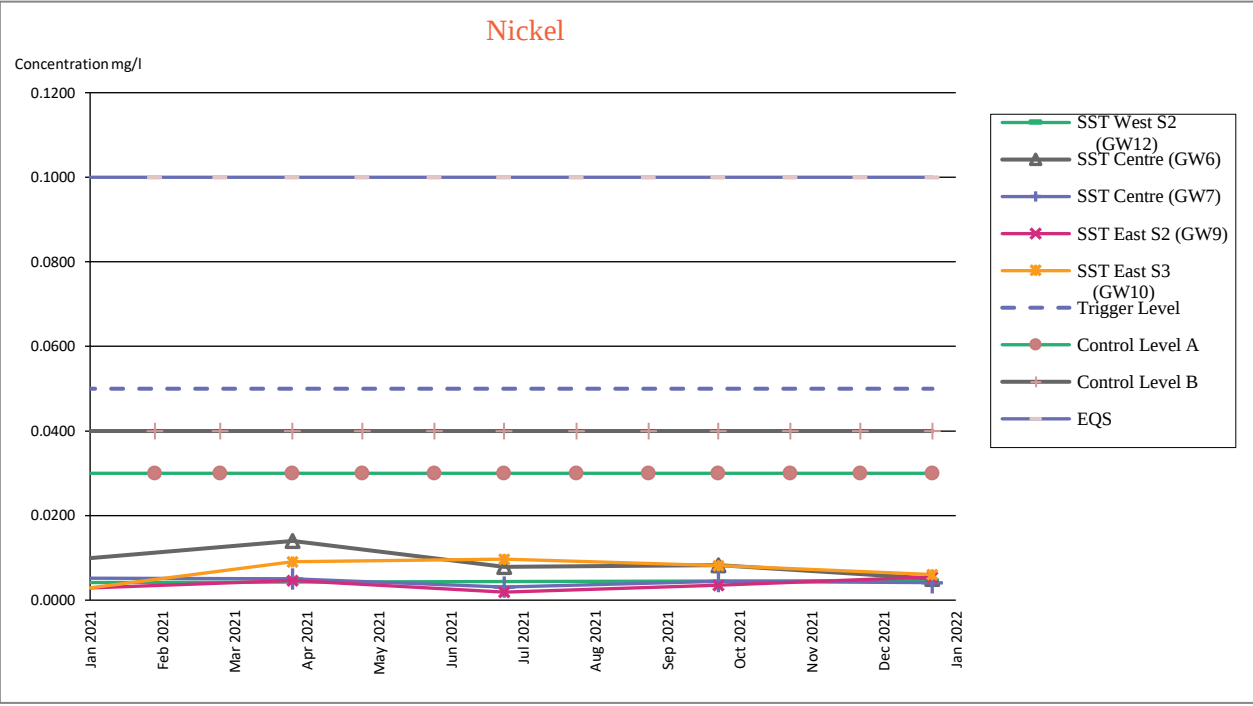
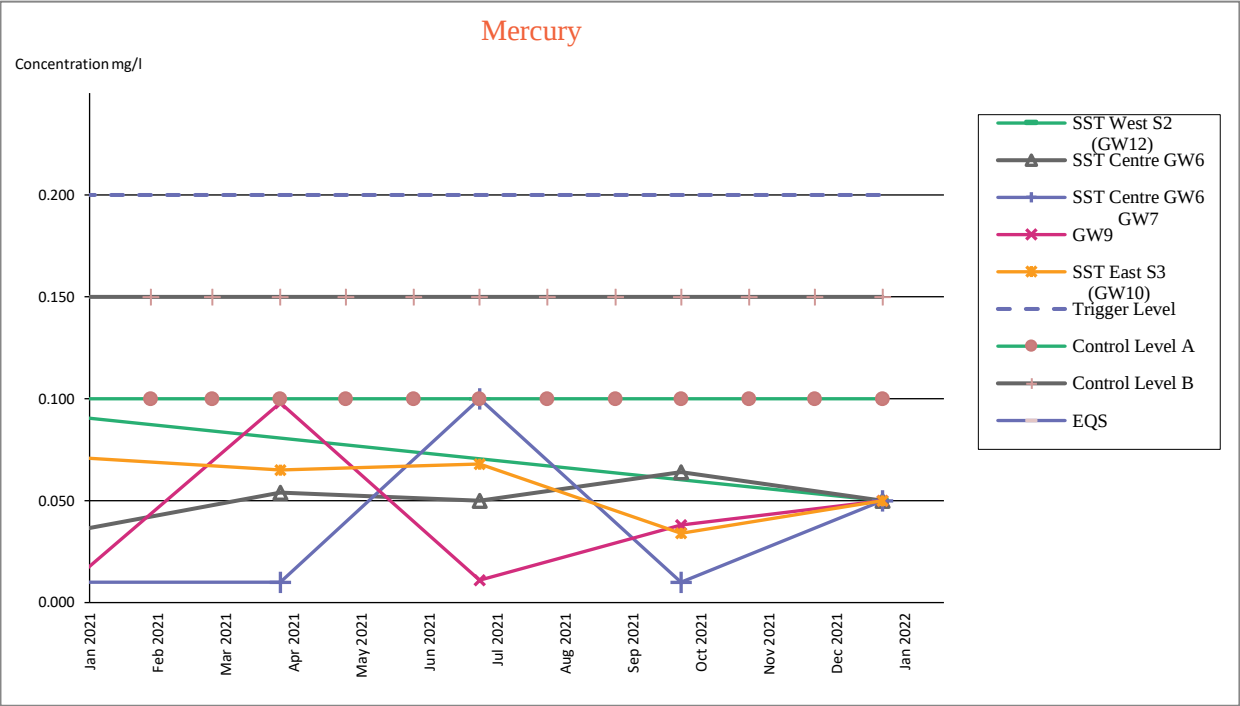


Figure A5
Groundwater quality monitoring results - Compliance wells graphs

Compliance wells graphs

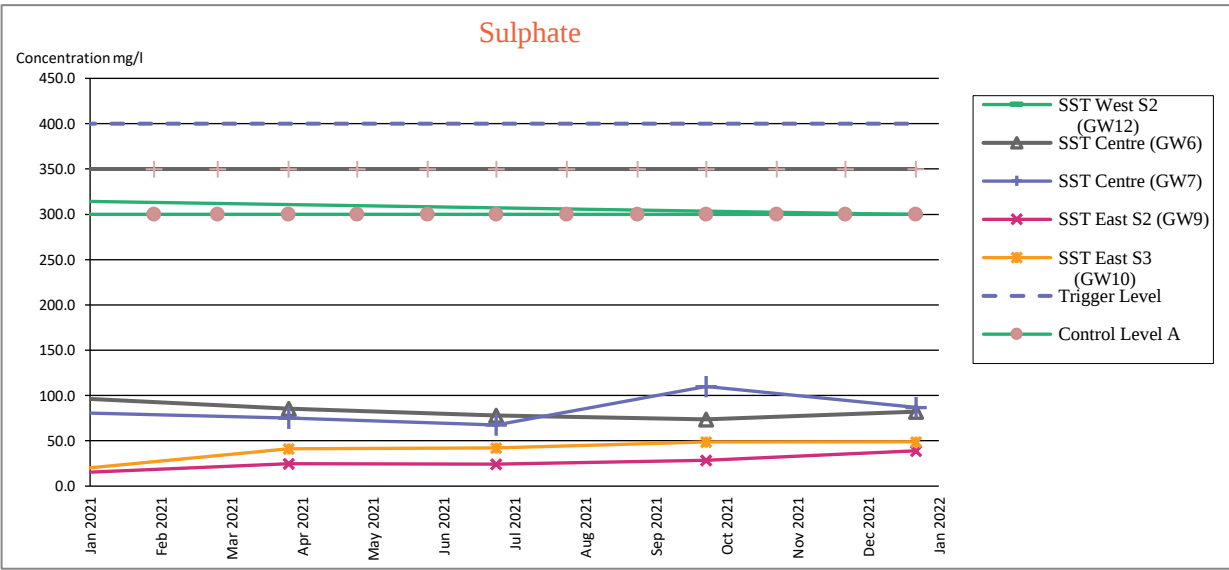
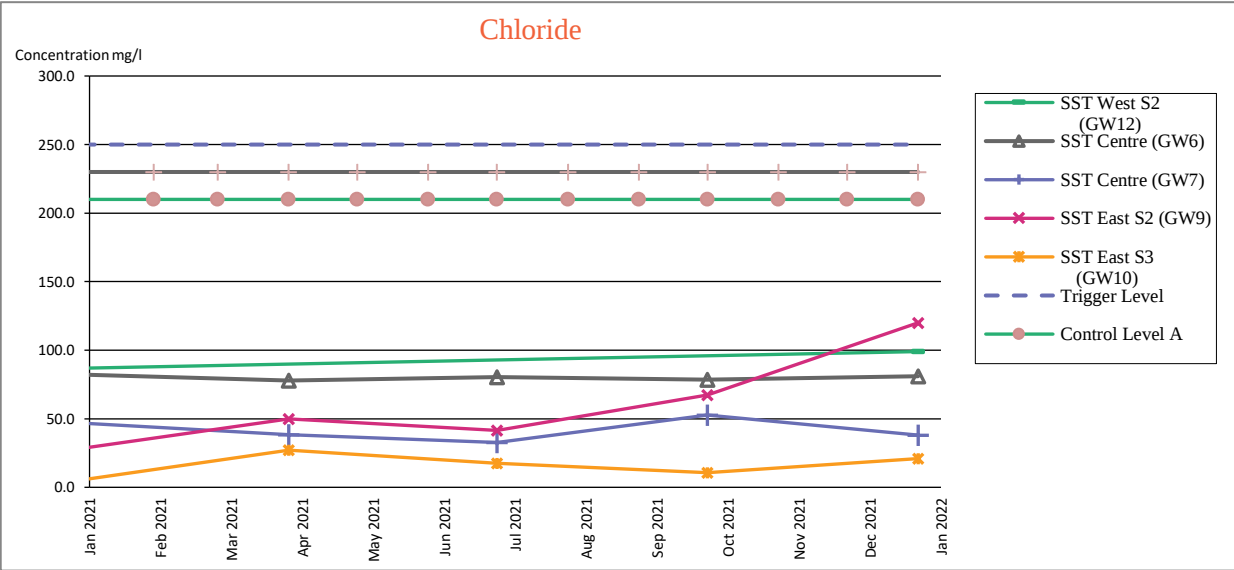
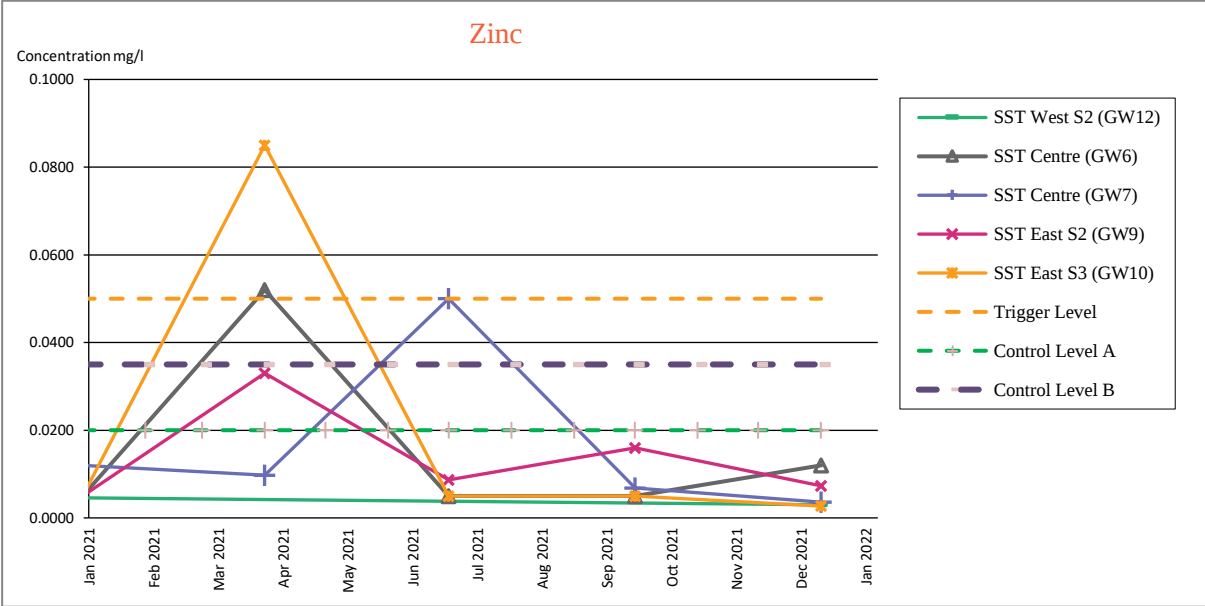
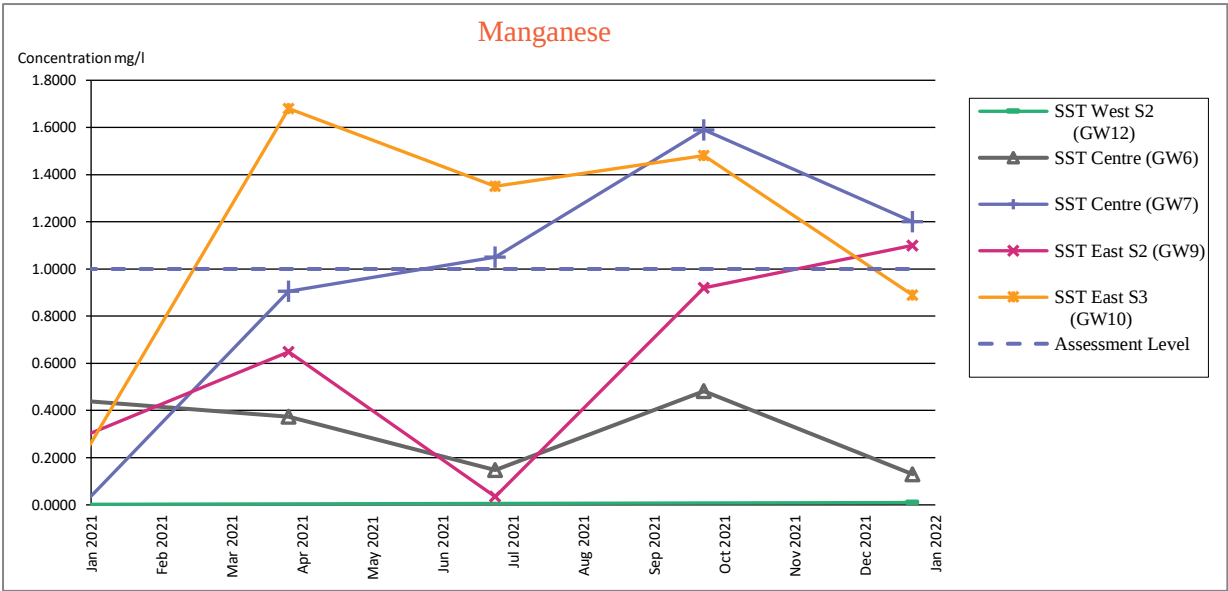


Figure A5
Groundwater quality monitoring results - Compliance wells graphs

Compliance wells graphs

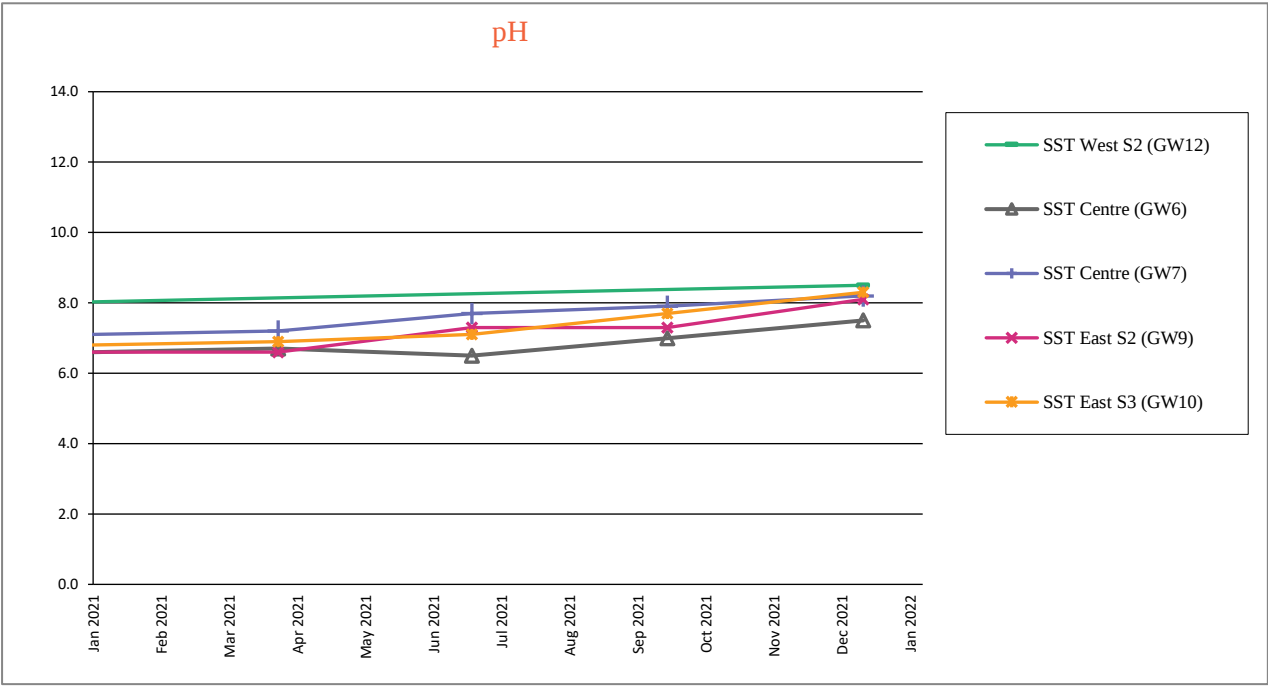


Figure A6
Groundwater quality monitoring results - Upstream wells graphs

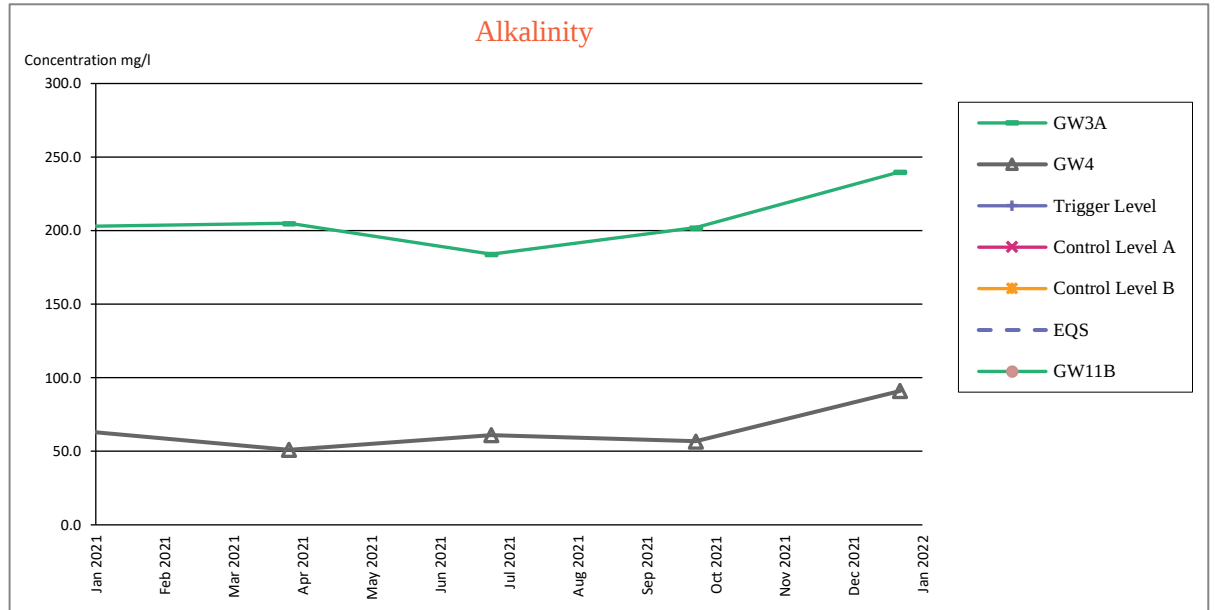
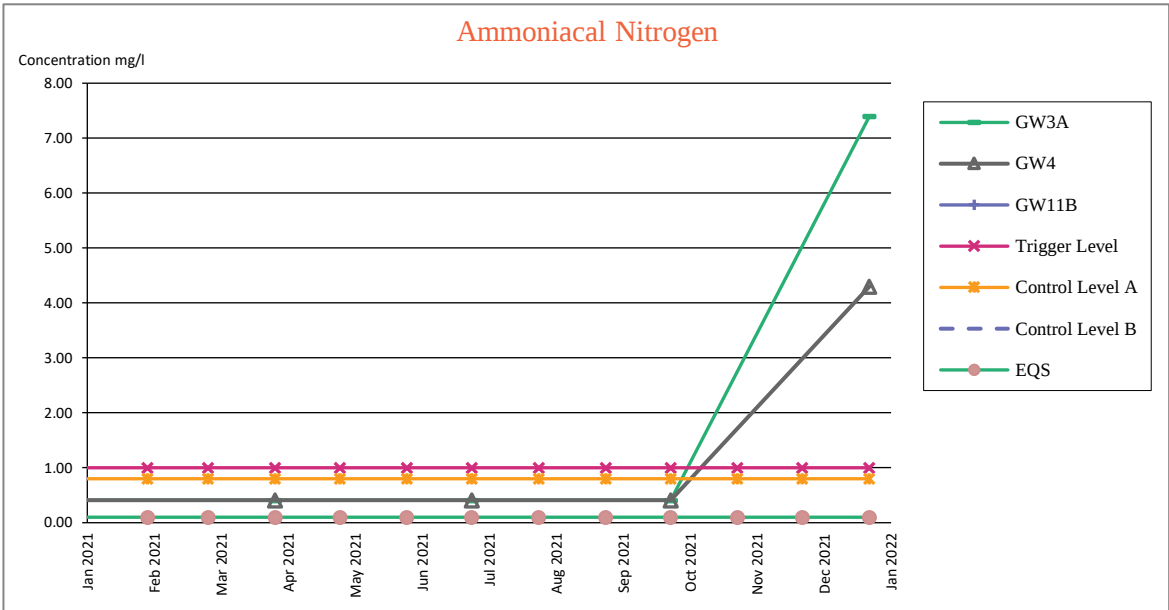
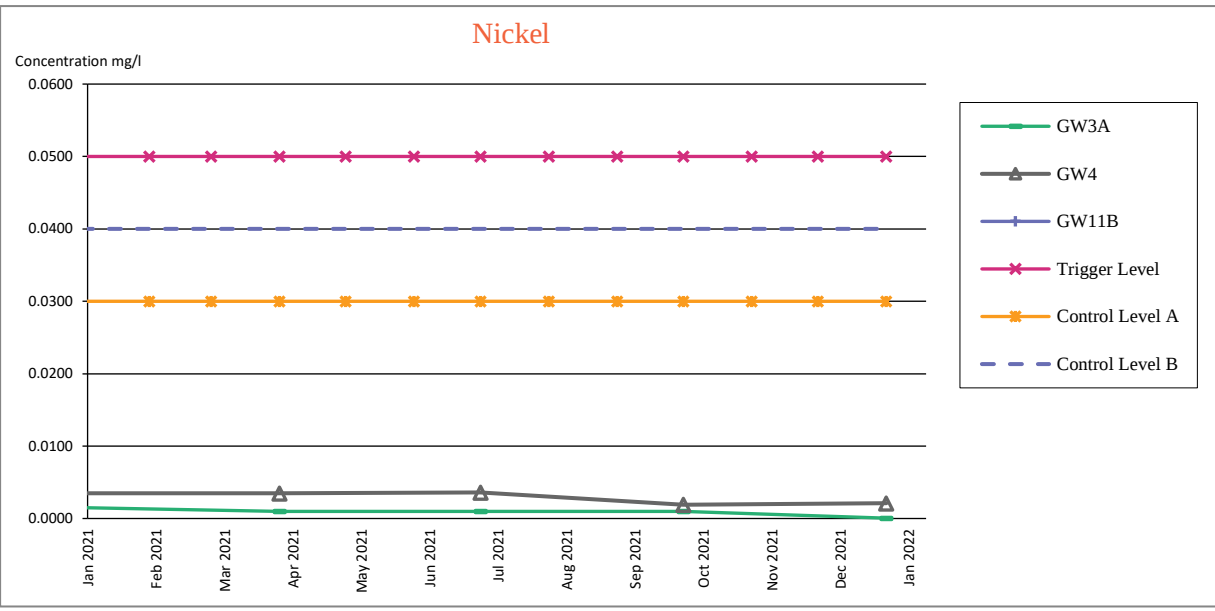
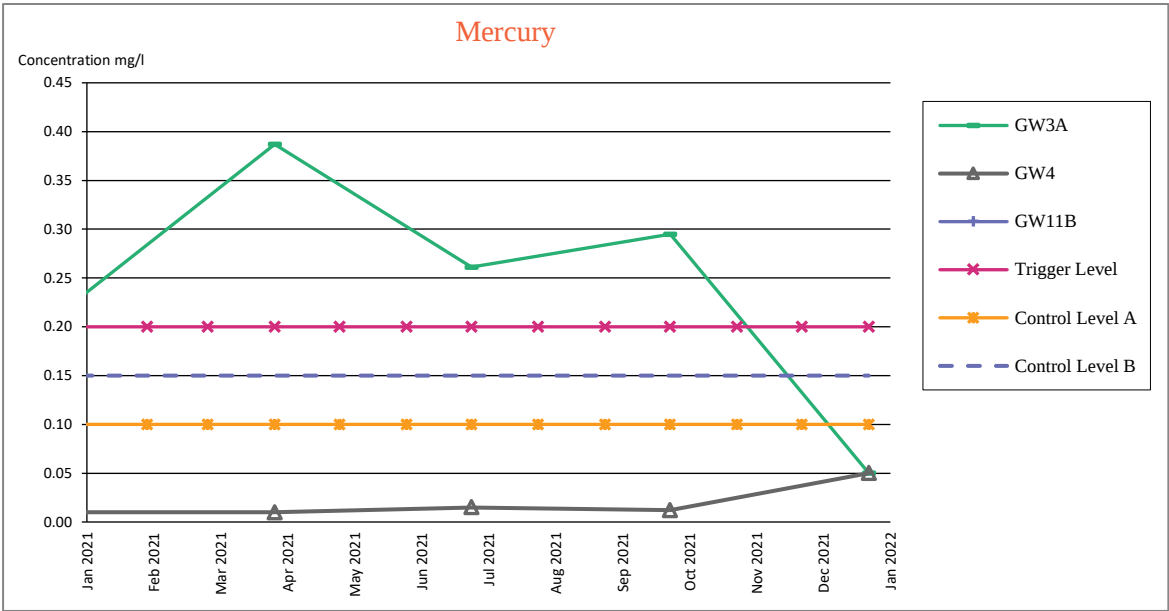


Figure A6
Groundwater quality monitoring results - Upstream wells graphs

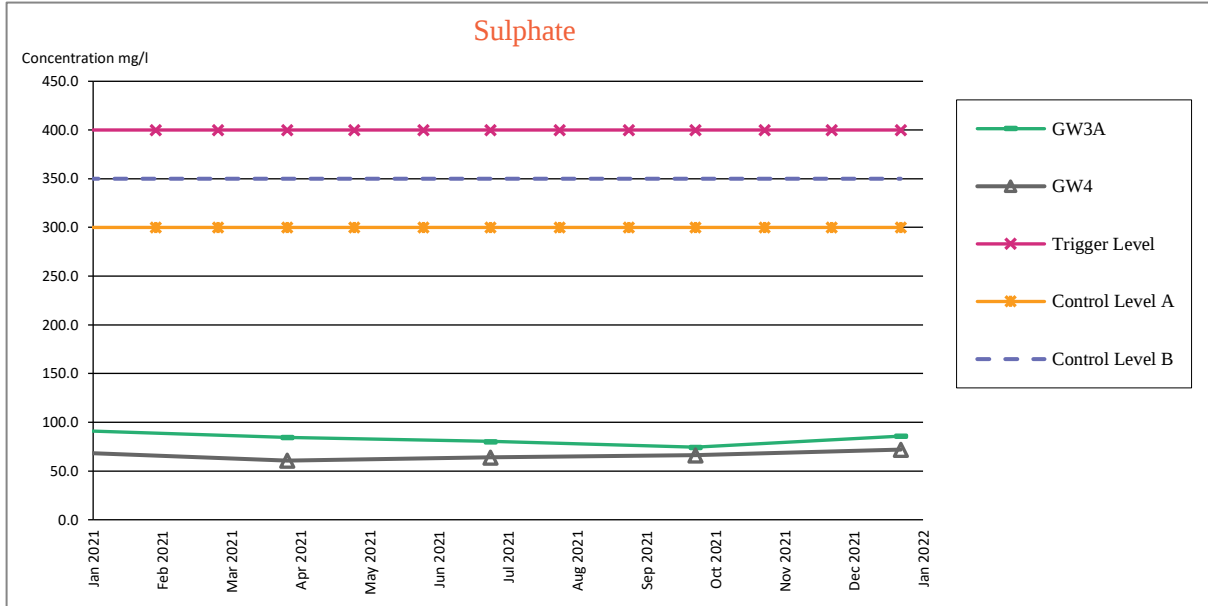
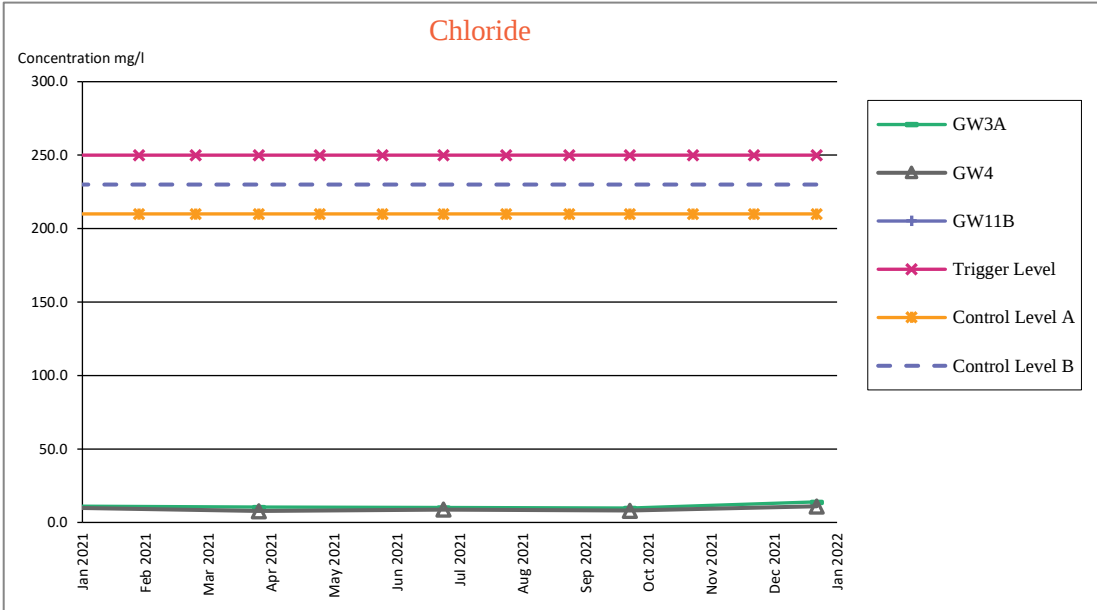
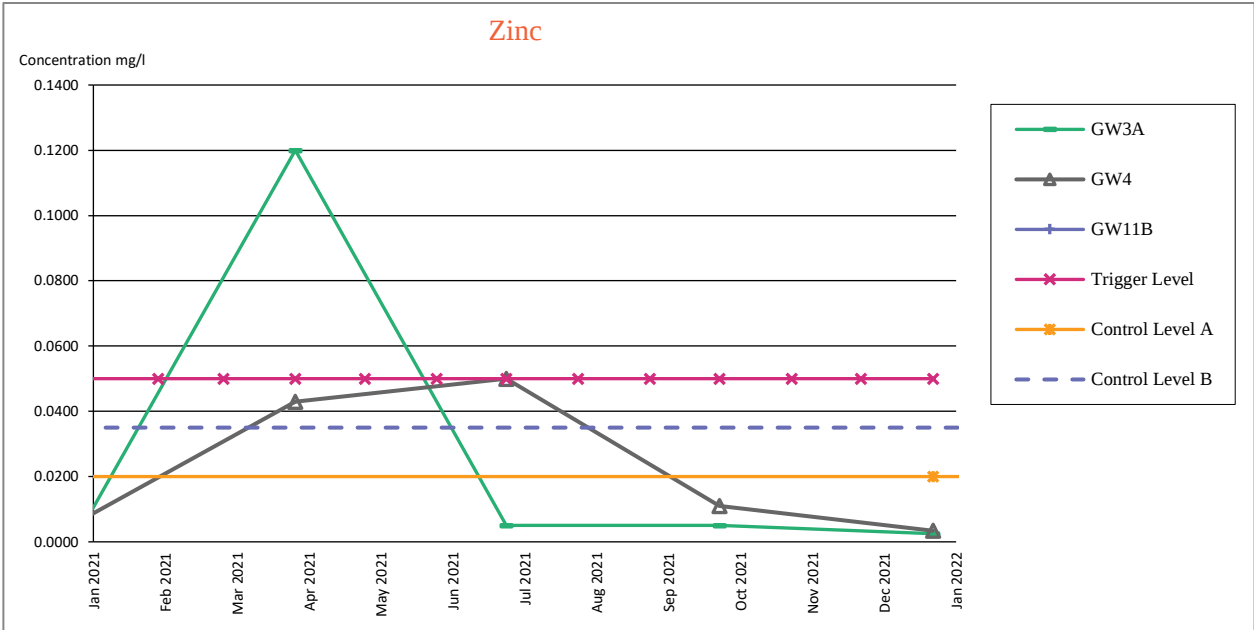
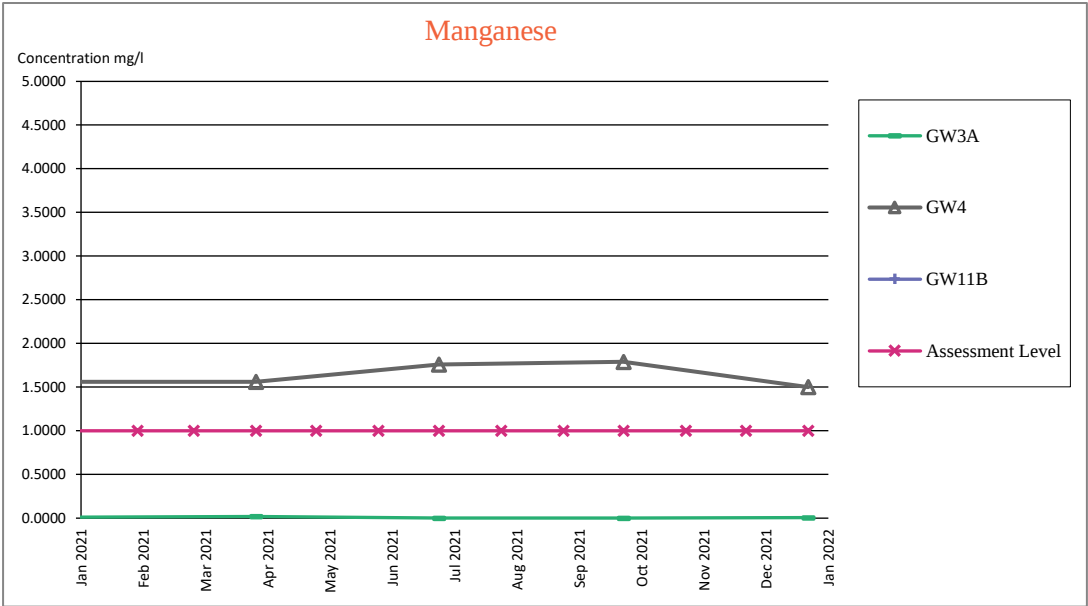
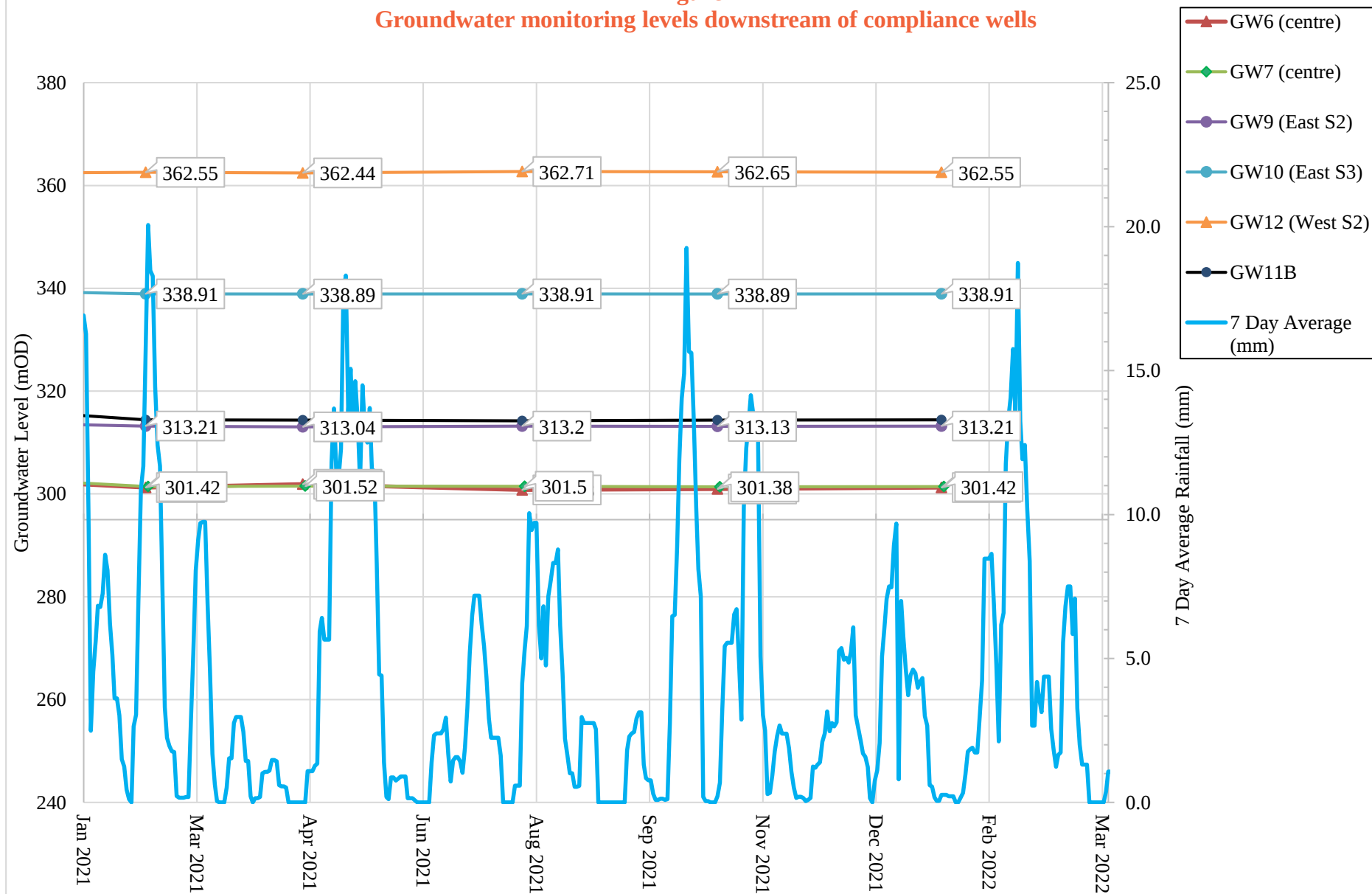


Figure A6
Groundwater quality monitoring results - Upstream wells graphs



Figure A7
Groundwater monitoring levels downstream of compliance wells



A.2 Monitoring Results- Tables

January 2022												
LOCATION	Units	L1A	L1B	LC1A	LC2A	LC4A	LC5A	Maximum concentration (mg/l)	Monthly Average (mg/l)	Acceptable Maximum Concentration (AMC) (mg/l)	LP3A	LP4
Date Sampled	20th Jan 2022	-						-	-	-		
Manganese in filtrate as Mn	mg/l	N/S	0.32	N/S	0.34	0.6	N/S	0.6	0.42	--	0.011	0.087
Mercury, filt trace as Hg	mg/l	N/S	< 0.0005	N/S	< 0.00011	< 0.00005	N/S	0.0005	0.0002	0.00056	< 0.00005	< 0.00005
Nickel in filtrate as Ni	mg/l	N/S	< 0.0097	N/S	0.12	0.0071	N/S	0.12	0.05	0.0681	0.0051	0.0064
Zinc, ultra-low filtered as Zn	mg/l	N/S	0.019	N/S	0.075	< 0.0025	N/S	0.075	0.03	1.38	0.008	0.016
pH	pH Units	N/S	8.2	N/S	8.4	7.6	N/S	8.4	8.07	--	8.6	8.6
Conductivity- Electrical 20C	uS/cm	N/S	2200	N/S	11000	4400	N/S	11000	5867	--	1700	2000
Alkalinity as CaCO3	mg/l	N/S	520	N/S	5900	2400	N/S	5900	2940	--	480	640
Ammoniacal Nitrogen as N	mg/l	N/S	0.58	N/S	860	270	N/S	860	377	526	< 2.4	11
Chloride as Cl	mg/l	N/S	200	N/S	1100	220	N/S	1100	507	1408	130	140
Sulphate as SO4	mg/l	N/S	380	N/S	740	54	N/S	740	391	999	220	260
Redox Potential (see note 4)	mV	N/S	160	N/S	40	50	N/S	160	83	--	130	110
Total Suspended Solids	mg/l	N/S	74	N/S	5700	840	N/S	5700	2205	--	30	27
Solids, Total Dissolved 180 deg C	mg/l	N/S	1400	N/S	7200	2900	N/S	7200	3833	--	1100	1300
Dissolved Oxygen, Fixed*	mg/l	N/S	-	N/S	-	-	N/S	-	-	--	-	-
TOC (filtered)	mg/l	N/S	19	N/S	1900	650	N/S	1900	856.3	--	12	14

- 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)

*Dissolved Oxygen, Fixed was not sampled this quarter

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											
	Elevation at top of casing mAOD	398.85											
	Depth to leachate from top of casing (m)	40.34											
	Leachate elevation (mAOD)	358.51											
	Calculated leachate head (m)	0.89											
LC2A	Elevation of base of landfill mAOD	362.49											
	Elevation at top of casing mAOD	401.12											
	Depth to leachate from top of casing (m)	35.76											
	Leachate elevation (mAOD)	365.36											
	Calculated leachate head (m)	2.87											
LC4A	Elevation of base of landfill mAOD	372.27											
	Elevation at top of casing mAOD	401.14											
	Depth to leachate from top of casing (m)	26.81											
	Leachate elevation (mAOD)	374.33											
	Calculated leachate head (m)	2.06											
LC5A	Elevation of base of landfill mAOD	350.14											
	Elevation at top of casing mAOD	380.75											
	Depth to leachate from top of casing (m)	DAMAGED											
	Leachate elevation (mAOD)												
	Calculated leachate head (m)												
L1	Casing height (mAOD)	357.00											
	Leachate (mbgl)	DRY											
	Leachate (m AOD)	-											
	Base of landfill (m AOD)	336.80											
	Depth of well from top of casing (m)	21.03											
	Base of well (m AOD)	335.97											
	Calculated leachate head (m)												
L1A*	Casing height (mAOD)	355.79											
	Leachate (mbgl)	DRY											
	Leachate (m AOD)	-											
	Base of landfill (m AOD)	316.64											
	Depth of well from top of casing (m)	20.89											
	Base of well (m AOD)	334.90											
	Calculated leachate head (m)												
L1B*	Casing height (mAOD)	354.80											
	Leachate (mbgl)	24.97											
	Leachate (m AOD)	329.83											
	Base of landfill (m AOD)	319.60											
	Depth of well from top of casing (m)	34.84											
	Base of well (m AOD)	319.96											
	Calculated leachate head (m)	10.23											

2022	Quarterly Leachate Head Averages (m)
January	1.94
February	
March	
April	
May	
June	
July	
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
1. LC1A top of casing is 1710mm above ground level.
2. LC2A top of casing is 820mm above GL.
3. LC4A top of casing is 1040mm above GL.
4. 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	
			ug/l	mg/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	
	Freshwater EQS**		1	0.123	0.004	0.004	0.0137	0.0137				0.015**		250	400							
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	N/S	N/S	
		SW2A1	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	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	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	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	N/S	
	Downstream of Landfill	SWD	Quarterly	< 0.05	0.01	0.001	< 0.001	0.003	0.002	8.60	410.00	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	300.00	1.20	0.035	4.20	13.00	63.00	5.00	-	17.00	56.00	75.00	26.00	
February	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	N/S	
		SW2A1	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	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	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	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	N/S	
	Downstream of Landfill	SWD	Quarterly	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	N/S
		SWD1	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	N/S	
March	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	N/S	N/S
		SW2A1	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	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	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	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	N/S	
	Downstream of Landfill	SWD	Quarterly	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	N/S
		SWD1	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	N/S	
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	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	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	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 ^{aaa})	--	0.04	(0.035 ^{aaa})	--	--	--	0.9	--	--	230	350	--	--	--			
Assessment Level					--	(1.0 ^a)	--	--	--	--	--	--	--	--	--	--	--	--	--			
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	<	0.001	<	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	0.167	12.9	14.0	86.0	58.0	-	3.1
	Feb-22																					
	Mar-22																					
	Apr-22																					
	May-22																					
	Jun-22																					
	Jul-22																					
	Aug-22																					
	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																					
	Mar-22																					
	Apr-22																					
	May-22																					
	Jun-22																					
	Jul-22																					
	Aug-22																					
	Sep-22																					
	Oct-22																					
	Nov-22																					
	Dec-22																					
GW11B	Jan-21	Not sampled																				
	Feb-21		Quarterly																			
	Mar-21																					
	Apr-21	Not sampled																				
	May-21		Quarterly																			
	Jun-21																					
	Jul-21	Not sampled																				
	Aug-21		Quarterly																			
	Sep-21																					
	Oct-21	Not sampled																				
	Nov-21		Quarterly																			
	Dec-21																					
	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

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-20	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-20		Quarterly																	
	Mar-20																			
	Apr-20	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-20		Quarterly																	
	Jun-20																			
	Jul-20	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-20		Quaterly																	
	Sep-20																			
	Oct-20	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-20		Quarterly																	
	Dec-20																			
	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																			
	Mar-22																			
	Apr-22																			
	May-22																			
	Jun-22																			
	Jul-22																			
	Aug-22																			
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		Quaterly																	
	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																			
	Mar-22																			
	Apr-22																			
	May-22																			
	Jun-22																			
	Jul-22																			
	Aug-22																			
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		Quaterly																	
	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																			
	Mar-22																			
	Apr-22																			
	May-22																			
	Jun-22																			
	Jul-22																			
	Aug-22																			
Sep-22																				
Oct-22																				
Nov-22																				
Dec-22																				

	Exceedance of Control Level
	Exceedance of Trigger Level
	Exceedance of Assessment Level

^ Ammonia result confirmed on duplicate analysis.

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	
Date monitored		18/01/22	02/02/22	01/04/22										18/01/22	02/02/22	01/04/22											
GMW2	Red Valve	0	0	0										0.7	0.7	0.4										Red Valve, 25.5m depth	
	Yellow Valve	0	0	0										0	0	0.2										Yellow Valve,14m depth	
	White Valve	0	0	0										0	0	0.1										White Valve, 4m 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 Red	-	-	-	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	-	-	-	-	-	-	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	Trigger Level Yellow	
	Trigger Level White	-	-	-	-	-	-	-	-	-	-	-	-	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	Trigger Level White	
	Control Level Red	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	Control Level Red	
	Control Level Yellow	-	-	-	-	-	-	-	-	-	-	-	-	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	Control Level Yellow	
Control Level White	-	-	-	-	-	-	-	-	-	-	-	-	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	Control Level White		
GMW3	Red Valve	0	0	0										2.0	2.0	4.9										Red Valve, 19m depth	
	Yellow Valve	0	0	0										3.8	3.9	1.1										Yellow Valve,9m depth	
	White Valve	0	0	0										4.3	4.5	0.9										White Valve, 3.5m 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 Red	-	-	-	-	-	-	-	-	-	-	-	-	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	Trigger Level Red	
	Trigger Level Yellow	-	-	-	-	-	-	-	-	-	-	-	-	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	2.67	Trigger Level Yellow	
	Trigger Level White	-	-	-	-	-	-	-	-	-	-	-	-	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	24.02	Trigger Level White	
	Control Level Red	-	-	-	-	-	-	-	-	-	-	-	-	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8	Control Level Red	
	Control Level Yellow	-	-	-	-	-	-	-	-	-	-	-	-	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	Control Level Yellow	
Control Level White	-	-	-	-	-	-	-	-	-	-	-	-	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	23.5	Control Level White		
GMW4	Red Valve	0	0	0										0.2	0.1	0.1										Red Valve, 30m depth	
	Yellow Valve	0	0	0										0	0.1	0.1										Yellow Valve,20m depth	
	White Valve	0	0	0										0	0	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 Red	-	-	-	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	-	-	-	-	-	-	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	Trigger Level Yellow	
	Trigger Level White	-	-	-	-	-	-	-	-	-	-	-	-	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	Trigger Level White	
	Control Level Red	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	Control Level Red	
	Control Level Yellow	-	-	-	-	-	-	-	-	-	-	-	-	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	Control Level Yellow	
Control Level White	-	-	-	-	-	-	-	-	-	-	-	-	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	11.6	Control Level White		
GMW5	Red Valve	0	0	0										5.5	5.4	5.7										Red Valve, 26.3m depth	
	Yellow Valve	0	0	0										2.8	2.8	3.4										Yellow Valve,15m depth	
	White Valve	0	0	0										4.6	4.4	4										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 Red	-	-	-	-	-	-	-	-	-	-	-	-	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	8.48	Trigger Level Red	
	Trigger Level Yellow	-	-	-	-	-	-	-	-	-	-	-	-	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	Trigger Level Yellow	
	Trigger Level White	-	-	-	-	-	-	-	-	-	-	-	-	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	4.8	Trigger Level White	
	Control Level Red	-	-	-	-	-	-	-	-	-	-	-	-	7.98	7.98	7.98	7.98	7.98	7.98	7.98	7.98	7.98	7.98	7.98	7.98	Control Level Red	
	Control Level Yellow	-	-	-	-	-	-	-	-	-	-	-	-	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	Control Level Yellow	
Control Level White	-	-	-	-	-	-	-	-	-	-	-	-	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	Control Level White		
GMW6	Red Valve	0	0	0										4.2	4.2	3.6										Red Valve, 26.3m depth	
	Yellow Valve	0	0	0										2.1	1.6	2.1										Yellow Valve,15m depth	
	White Valve	0	0	0										1.7	1.8	1.8										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 Red	-	-	-	-	-	-	-	-	-	-	-	-	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	Trigger Level Red	
	Trigger Level Yellow	-	-	-	-	-	-	-	-	-	-	-	-	5	5	5	5	5	5	5	5	5	5	5	5	Trigger Level Yellow	
	Trigger Level White	-	-	-	-	-	-	-	-	-	-	-	-	3.76	3.76	3.76	3.76	3.76	3.76	3.76	3.76	3.76	3.76	3.76	3.76	Trigger Level White	
Control Level Red	-	-	-	-	-	-	-	-	-	-	-	-	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	Control Level Red		
Control Level Yellow	-	-	-	-	-	-	-	-	-	-	-	-	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	Control Level Yellow		
Control Level White	-	-	-	-	-	-	-	-	-	-	-	-	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	3.26	Control Level White		

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										0.3	0.2	0.1											Yellow Valve,12 depth
	White Valve	0	0	0										0.3	0	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	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	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										1.2	0	0											Red Valve, 26.3m depth
	Yellow Valve	0	0	0										0.7	0	2.7											Yellow Valve,15m depth
	White Valve	0	0	0										0.9	0	1											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	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	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	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	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	2.4	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	5	5	5	5	5	5	5	5	5	5	5	5	Control Level White	
GMW13	Red Valve	0	0	0										1.2	1.2	1.3											Red Valve, 26.3m depth
	Yellow Valve	0.1	0.1	0.1										4.5	4.4	4.8											Yellow Valve,15m depth
	White Valve	0	0	0										3.9	4	4											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	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	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	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	
	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	5.32	Control Level White	
GMW14/14A	Red Valve	0	0	0										4.6	4.9	2.8											Red Valve, 26.3m depth
	Yellow Valve	0	0	0										5.9	6.5	6.4											Yellow Valve,15m depth
	White Valve	0	0	0										6.7	6.5	6.5											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	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	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	5.4	Trigger Level White
	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	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	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	4.9	Control Level White	
GMW1**	Red Valve	1.7	0.1	nt										2.4	0.3	nt											Red Valve, 23.5m depth
	Yellow Valve	0	17.3	nt										0	5.1	nt											Yellow Valve,14.7m depth
	White Valve	tap damage	0	nt										tap damage	0	nt											White Valve, 6.5m depth
GMW8*	Yellow Valve	6.6	6.8	6.8										7.7	7.8	7.7											Yellow Valve,17.5m depth
	White Valve	0	0	0										4.7	5	4.5											White Valve, 5.7m depth
GMW9*	Red Valve	0	0	0										2	2	2.1											Red Valve, 27m depth
	Yellow Valve	20.2	18.3	18.5										8.4	8.8	8.3											Yellow Valve,15m depth
	White Valve	0	0	0										0.1	0.1	0.1											White Valve, 8.5m depth
GMW10*	Red Valve	0	0	20.4										4.4	4.2	5.1											Red Valve, 19.5m depth
	Yellow Valve	14.5	7	29.2										2.4	1.3	4.7											Yellow Valve,15m depth
	White Valve	0	0	17.7										4.7	4.1	5											White Valve, 8m depth
GMW17**	Red Valve	0	0	0										1.6	1.5	1.6											Red Valve, 26.3m depth
	Yellow Valve	0	0	0										5.9	5.3	5.3											Yellow Valve,15m depth
	White Valve	0	0	0										3.3	4.6	4											White Valve, 5m depth
GMW18**	Yellow Valve	0	0	0										0.1	1.6	0.1											Yellow Valve,12 depth
	White Valve	0	0	0										6	5.3	5.1											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 asteriscs (**) are present, no trigger levels have been set, as not require by the Permit (Reference [2]).

Exceedance of Trigger

Exceedance of Control