

Blaenau Gwent County Borough Council

Silent Valley Landfill

2024 First Quarter Monitoring Report

Reference: 4-50

Issue 01 | 30 April 2024



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1. Introduction

This 2024 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 2024 in accordance with the Silent Valley Environmental Permit ^[1] (Permit no. MP3835SV) and the Aftercare Phase Environmental and Infrastructure Monitoring Program ^[5].

The data has been collected as referenced in Schedule 3 of the Consolidated Permit ^[1]. This report refers to the 2023 Annual and Fourth Quarter Monitoring Report ^[3].

1.1 Monitoring Regime

The monitoring regime is undertaken in accordance with the Aftercare Phase Environmental and Infrastructure Monitoring Program ^[5] 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 A, Figures A1 to A3**.

Based on the available data, the following summary has been provided:

- February recorded the most rainfall with 222.2mm in total. A total of 25 days during February recorded at least 0.3mm of rainfall.
- January was the driest month of the quarter, recording 142mm, around average for this time of year in comparison to 2008-2023 records. Despite having the most consecutive days without rainfall (17 days), January also recorded the highest daily rainfall total of 49mm on the 21st.

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 B, Table B1**.

LC5A has been inactive, but in October 2023, a new leachate monitoring well called LC5B was installed in the vicinity of LC5A. LC5B is now operational and included in this monitoring cycle.

To assess compliance, the Allowable Maximum Concentrations (AMC) are compared with the overall average concentrations from all combined wells. If AMC levels are exceeded, contingency actions are triggered.

No quarterly average leachate levels exceeded the AMC therefore these wells are compliant with the permit.

2.2.2 Leachate Level Monitoring

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

2.2.3 BSC Pipe

Leachate head measurements are undertaken in BH1 to BH4 which are located along the alignment of the BSC pipe. Leachate levels have remained relatively consistent indicating no rise in leachate levels therefore the pipe is working as required. Results are included **Appendix A Figure A8** and **Appendix B Table B6**.

2.3 Surface Water

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

Commentaries are provided for upstream and downstream monitoring points in the Nant Merddog 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.

These locations were not monitored this quarter.

2.3.2 Downstream Surface Water

SWD and SWD1

Results show both SWD and SWD1 are compliant this quarter.

2.4 Groundwater

2.4.1 Groundwater Quality Monitoring

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

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

2.4.1.1 Upstream Groundwater Wells

Wells 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. GW11B has not been sampled since the third quarter of 2019 as there has been not enough volume to take a sample.

GW4 continues to exceed assessment level of 1.0mg/l for manganese (1.88mg/l). The concentration of manganese has risen from last quarter (1.73mg/l). Manganese has consistently exceeded the assessment level since 2022.

These groundwater wells are positioned upstream and primarily monitor background concentrations.

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 have been recorded during 2023 and 2024.

Wells GW6 and GW7

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

GW7 has exceeded the assessment level of 1.0mg/l for manganese (1.09mg/l). This is a small increase from the last quarter. Manganese has continued to fluctuate in this well throughout 2022 and 2023. Manganese levels have historically been known to fluctuate within this well, and it is considered that the concentrations are also impacted by the upstream groundwater considering GW4 has also exhibited similar concentrations. A trend has identified that manganese exceeds assessment level once every 6 months in GW7 and then returns to compliance.

GW7 exceeded trigger level for ammoniacal nitrogen last quarter but is now compliant (<0.01mg/l). In accordance with the APEIMP ^[5], no further action is necessary unless three consecutive exceedances of the control or trigger level occur.

Well GW9

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

GW9 continues to exceed trigger levels of 1.0mg/l for ammoniacal nitrogen (4.7mg/l). This is a decrease from the previous quarter however, ammoniacal nitrogen concentrations have been known to fluctuate in this well. It is noted that the unionised ammoniacal nitrogen concentration is compliant in GW9.

Numerous reports have been compiled regarding the non-compliance issue at GW9. These reports consistently indicate that there are no discernible environmental consequences resulting from this non-compliance. These include:

- Borehole records for GW9 investigations (December 2010);
- Investigation into the Western Flank of the Cut-off System. Compliance wells GW9 and GW10 (August 2011) ^[15];
- Review of Geology South of Landfill Site (May 2013) ^[16] ;
- GW9 and Nant Merddog Monitoring Report (May 2015) ^[17] ;

- Review of Environmental Consequence of non-Compliance at GW9 (December 2017) ^[18]; and
- Updated review of non-Compliance at GW9 (May 2020) ^[19].

Well GW10

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

GW10 has continued to exceed assessment level of 1.0mg/l for manganese (2.31mg/l). The concentrations of manganese have continued to fluctuate in this well throughout 2022 and 2023.

GW10 exceeded trigger level for ammoniacal nitrogen last quarter but has now returned to compliancy (<0.12mg/l). In accordance with the APEIMP ^[5], no further action is necessary unless three consecutive exceedances of the control or trigger level occur.

Well GW12

GW12 has been installed in the sandstone strata classified as S2-West. GW12 has exceeded the control level A of 300mg/l for sulphate (321mg/l). Historically, GW12 exceeded for sulphate concentrations back in quarter three of 2023.

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 A, Figure A7**. Water levels have remained relatively consistent this quarter with no significant differences from the 2023 readings ^[3].

2.5 Landfill Gas

2.5.1 Methane

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

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

- GMW13 red valve: exceeding control levels of 1%v/v in March (1.1%v/v). This is the first exceedance in this well after remining complaint throughout 2023.
- GMW14/14A red and yellow valves: exceeding control levels 1.0%v/v and 1.2%v/v in March (0.9%v/v and 0.7%v/v).
- As stated by Golder Associates^[14], single exceedances do not require to be actioned. However, if ongoing exceedances are recorded then the relevant people require to be informed and appropriate measures of identification and solutions identified.

2.5.2 Carbon Dioxide

All monitoring wells remained compliant this quarter with exception of GMW4, GMW12 and GMW14/14A.

The exceedances throughout this quarter of both control and trigger levels include:

- GMW4 red valve: exceeding trigger levels of 1.5%v/v in January (1.5%v/v), February (2.1%v/v) and March (2.1%v/v). GMW4 did not exceed throughout all of 2023. These exceedances will be monitored closely in the next quarter.
- GMW12 yellow valve: exceeding trigger levels 2.4%v/v in March (3.3%v/v). This is the first exceedance of 2024 for GMW12.
- GMW14/14A all valves: exceeding red valve control level of 1%v/v in January (1%v/v). Typically the red valves exceeded control or trigger levels throughout all of 2022 and 2023. Additionally, GMW14/14A exceeded trigger levels of 1.5%v/v, 5.9%v/v and 5.4%v/v for all valves in March (20.8%v/v, 21.2%v/v and 21.4%v/v). All three valves also exceeded in March of 2022 and 2023.

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 of 2024 has noted the following:

- GW4, GW7 and GW10 all exceed manganese assessment levels.
 - The elevated concentrations recorded upstream (GW4) are likely to be from steel works waste deposited to the north of the landfill and old mine workings in the area. This is then recorded in the downstream wells. Manganese is also a typical contaminant of mine drainage, which is considered to be impacting the groundwater in the locale of the landfill.
 - For GW7 and GW10 no further action is necessary until three consecutive exceedances of the control or trigger level occur.
- Although GW9 remains non-compliant in terms of ammoniacal nitrogen concentrations, historical investigations have consistently shown that these exceedances do not significantly impact downstream receptors. Furthermore, we are awaiting confirmation from NRW on whether ammoniacal nitrogen should continue to be monitored in this well following the IC1B report regarding groundwater and leachate pumping conclusions.
- GW12 exceeds control level A for sulphate. This is the second exceedance since the third quarter of 2023. No action is required at this stage.
- GMW13 exceeded the red valve control level in March and GMW14/14A exceeded red and yellow valve control levels for methane in March. These single exceedances will not be actioned at this stage however will be monitored closely in the next quarter.
- GMW4 exceeded red valve trigger levels for carbon dioxide from January to March. Historically this well has been compliant. Depending on the findings next quarter an investigation may be undertaken.
- GMW12 exceeded the yellow valve trigger level in March, this single exceedance does not need to be actioned at this stage however will be monitored.
- GMW14/14A exceeds trigger levels in all valves in March. This is similar to 2023 recordings. No action will be undertaken at this stage however a review of the 2021 GMW14/14A technical note will be undertaken in 2024.

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, 2023 Annual and Fourth Quarter Monitoring Report, 31st January 2023.
- [4]Arup, Silent Valley Landfill, Interim GW9 and Nant Merddog W, Issue May 2015.
- [5]Arup, Silent Valley Landfill, Aftercare Phase Environmental and Infrastructure Monitoring Program, Issue June 2013.
- [6]Arup, Silent Valley Landfill, Hydrogeological Risk Assessment, document reference 04/6363, November 2004.
- [7]Arup, Silent Valley Landfill, Investigation into the Western Flank of the Cut-off System. Compliance Well GW9 and GW10, document reference 115825, August 2011.
- [8]Environment Agency, Guidance on Monitoring of Landfill Leachate, Groundwater and Surface Water, report reference LFTGN02, June 2014.
- [9]Arup, Silent Valley Landfill, Hydrogeological Risk Assessment (Supplementary Revision May 2009), document reference 09/7543, June 2009.
- [10]Environment Agency, Guidance on the management of landfill gas, document reference LFTGN03, June 2014.
- [11]The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.
- [12]Water Framework Directive - United Kingdom Technical Advisory Group (WFD-UKTAG), “Metal Bioavailability Assessment Tool (M-BAT),” 2014.
- [13]Arup, Silent Valley Landfill, Hydrogeological Risk assessment, document reference 2019/9559, July 2019.
- [14]Golder Associates, Establishment of Trigger Levels at Silent Valley landfill site, letter report dated 21 December 2006.
- [15]Arup (2011) Silent Valley landfill Investigation into the Western Flank of the Cut-off System. Compliance Wells GW9 and GW10.
- [16]Arup (2013) Silent Valley Review of Geology South of Landfill Site.
- [17]Arup (2015) Silent Valley GW9 and Nant Merddog Monitoring Report.
- [18]Arup (2017) Review of Environmental Consequence of non-Compliance at GW9.
- [19]Arup (2020) Updated review of non-Compliance at GW9.

Appendix A: Monitoring Results - Graphs

Figure A1
Daily rainfall totals and sampling events (January 2019 - March 2024)

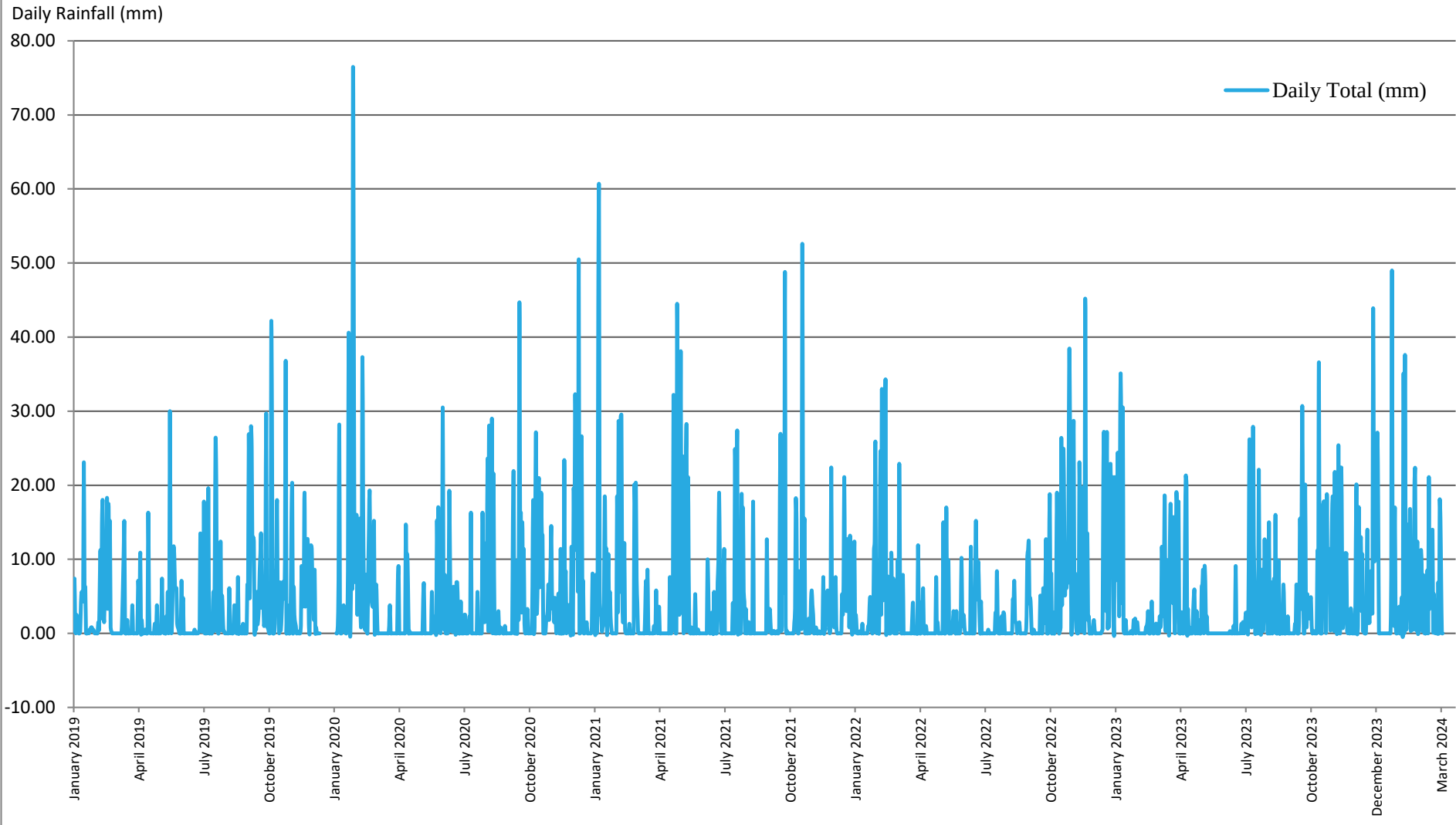
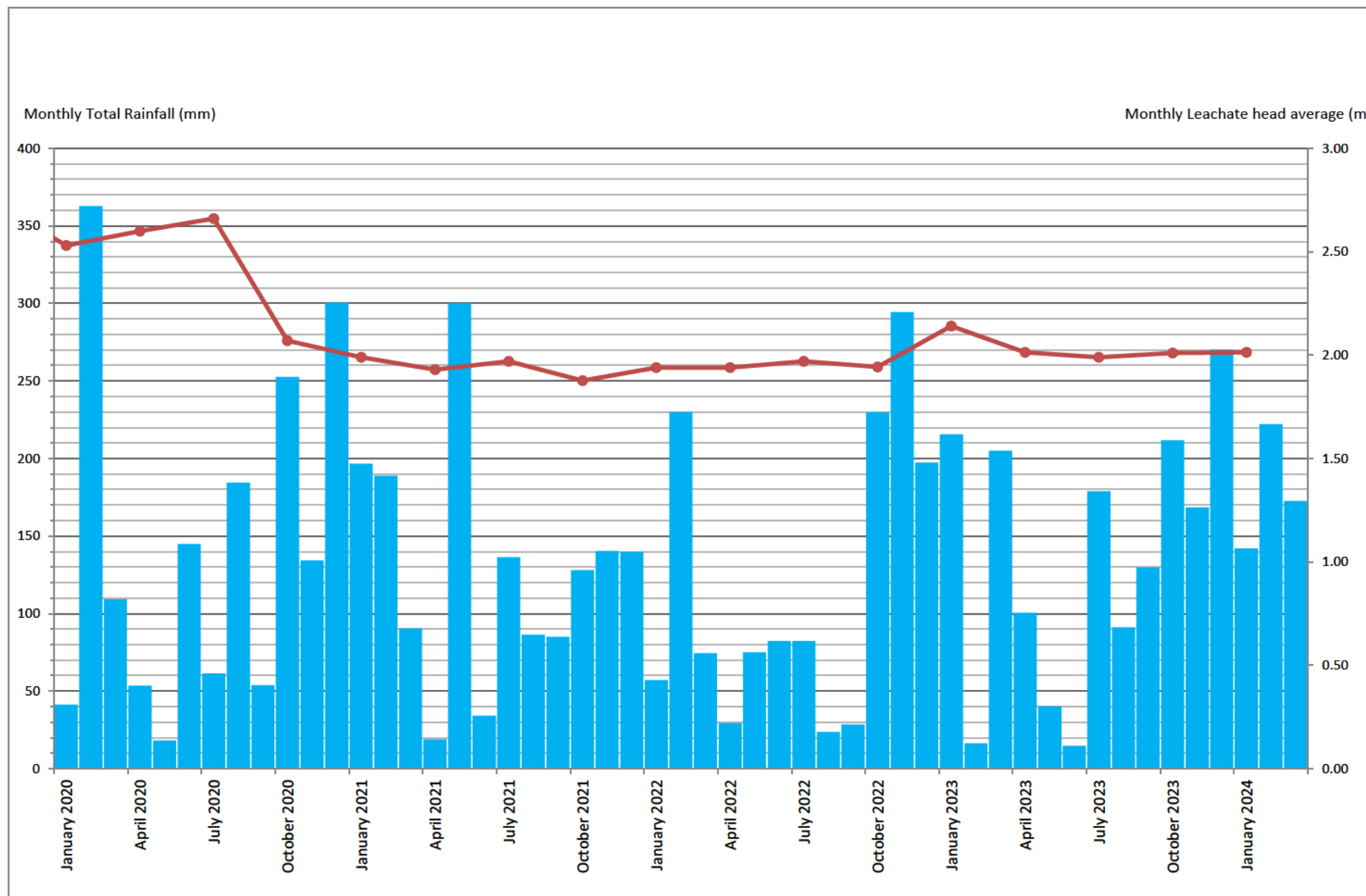


Figure A2
Monthly rainfall totals (January 2020 - March 2024)



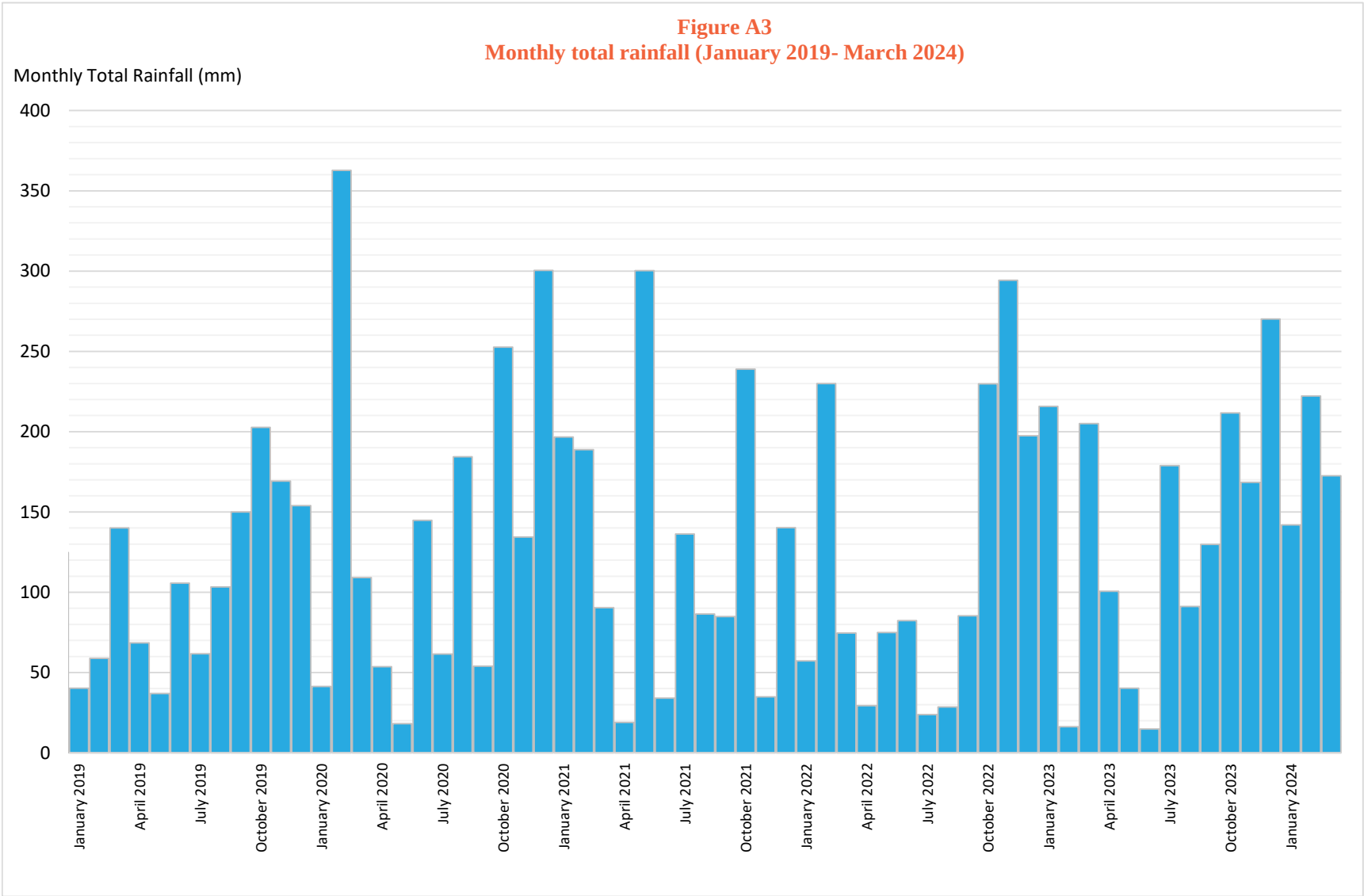


Figure A4
Surface water monitoring graphs

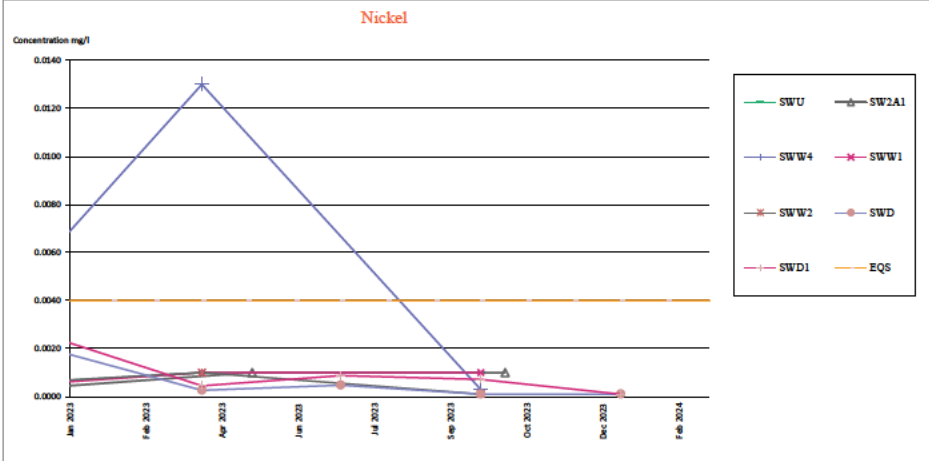
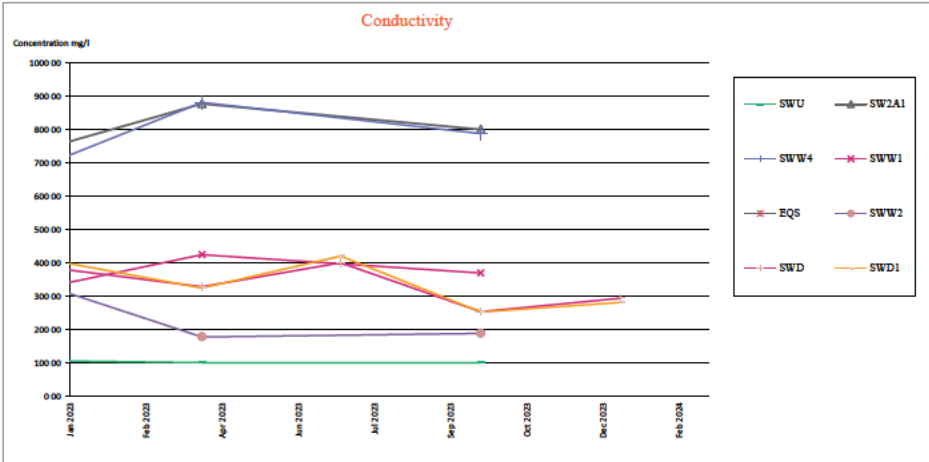
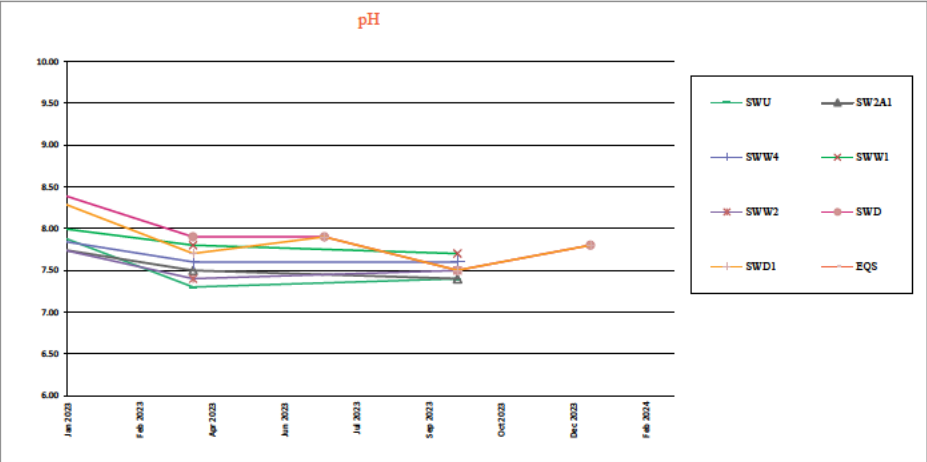


Figure A4
Surface water monitoring graphs

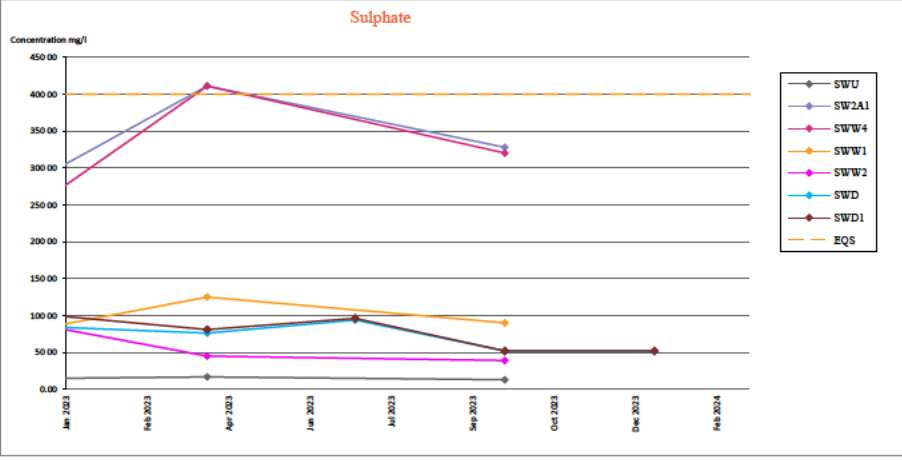
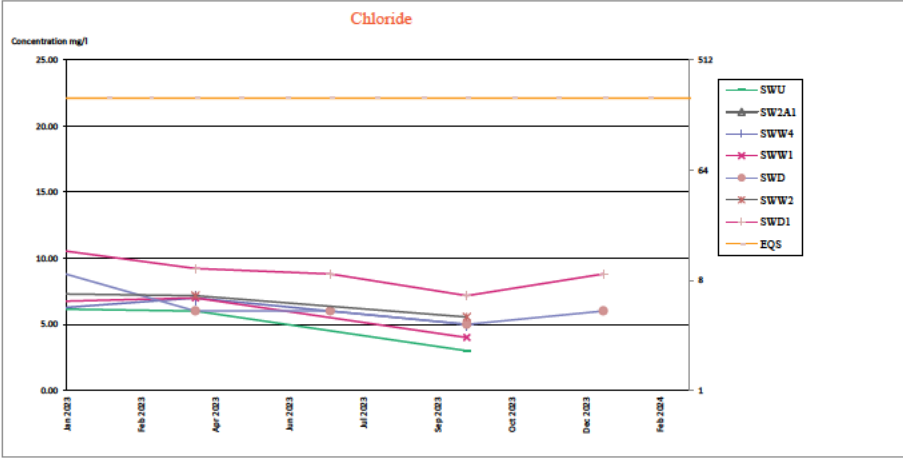
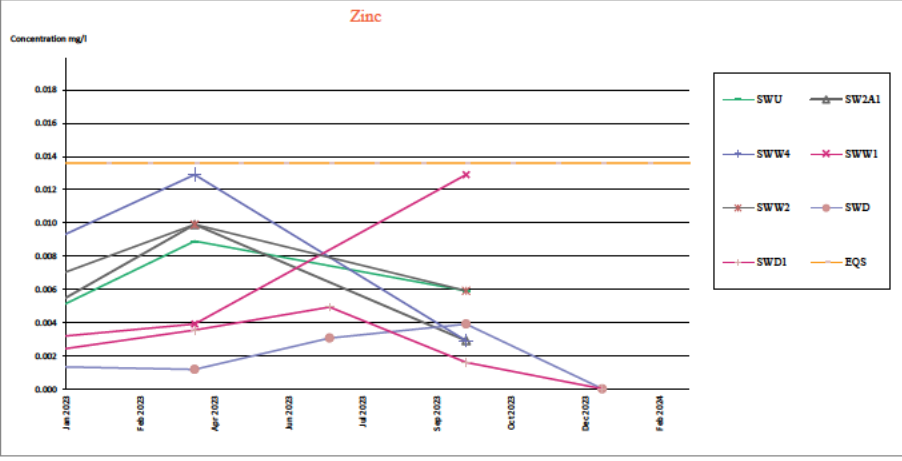
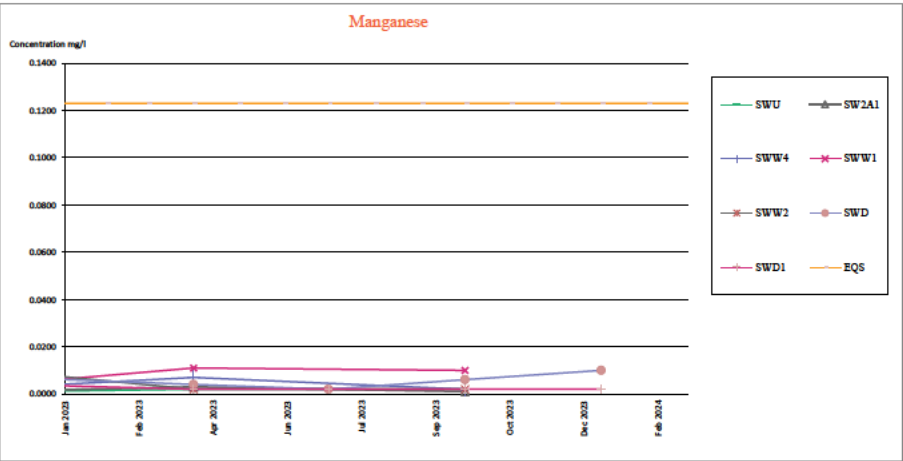


Figure A4
Surface water monitoring graphs

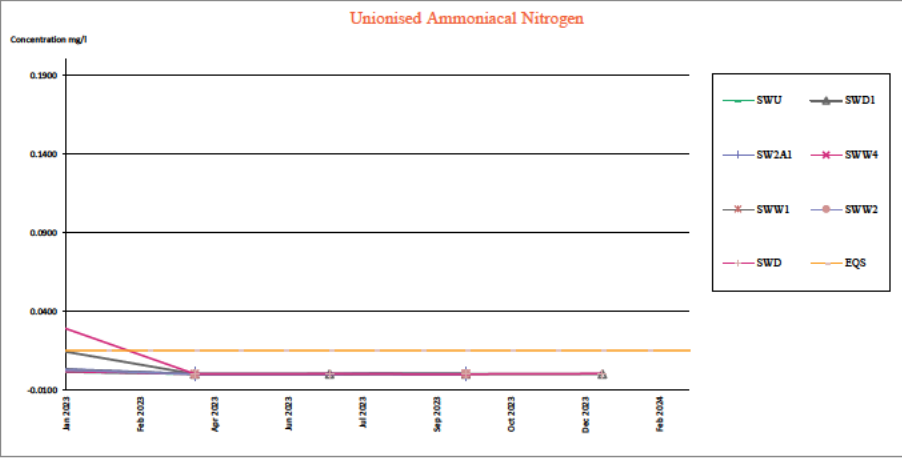
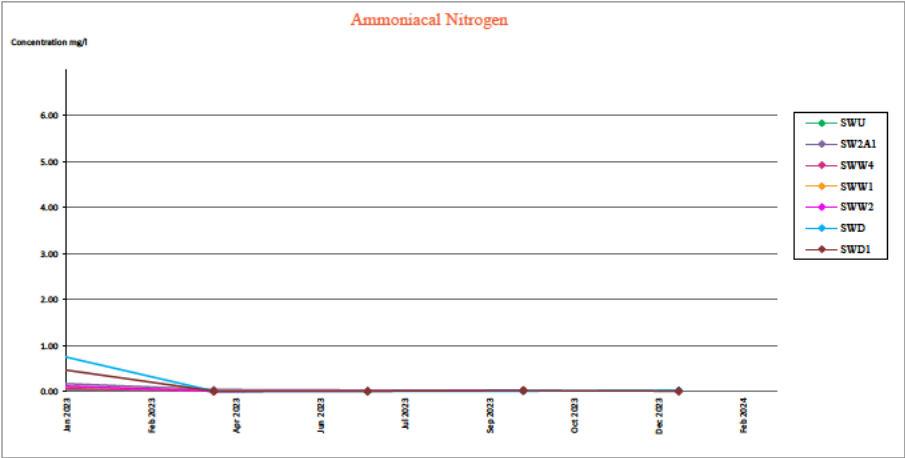
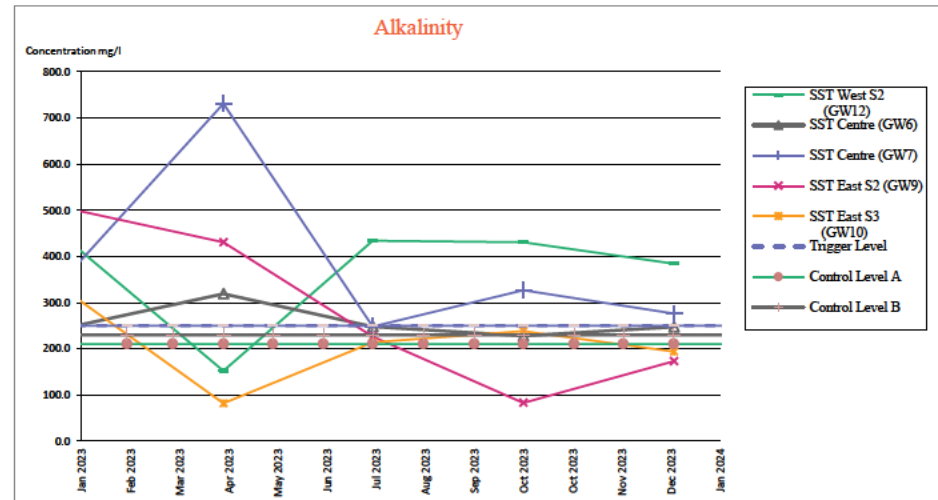
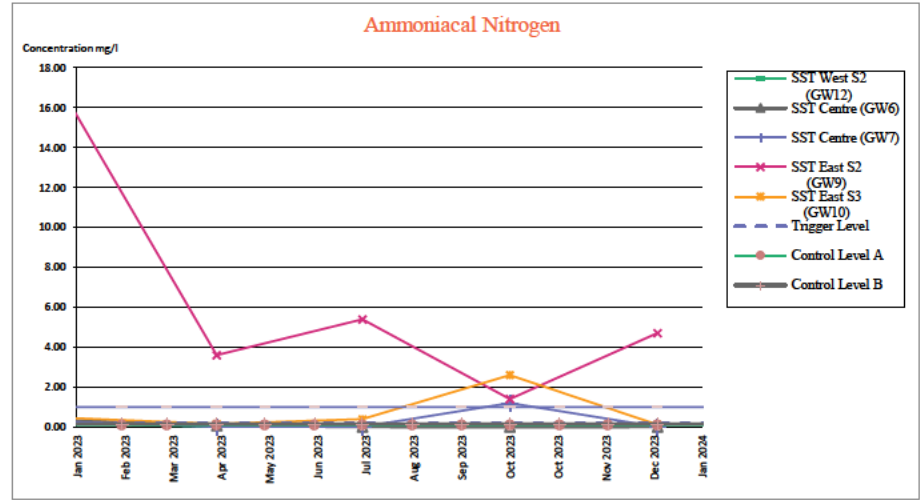
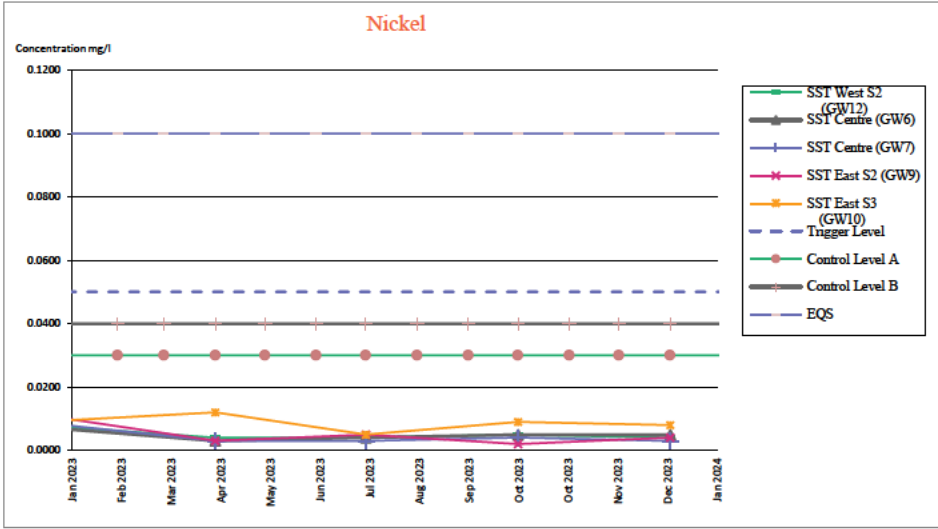
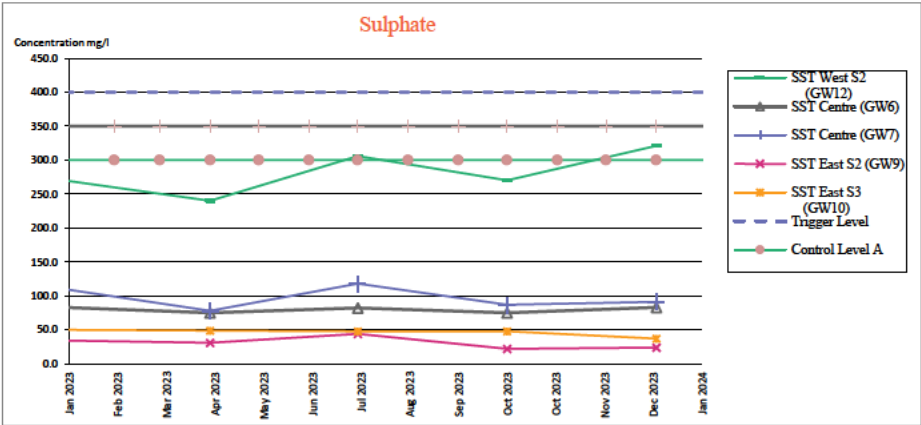
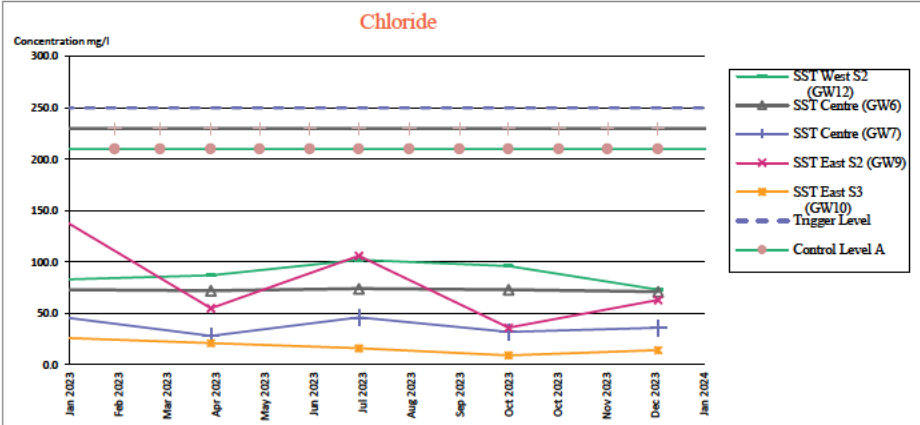
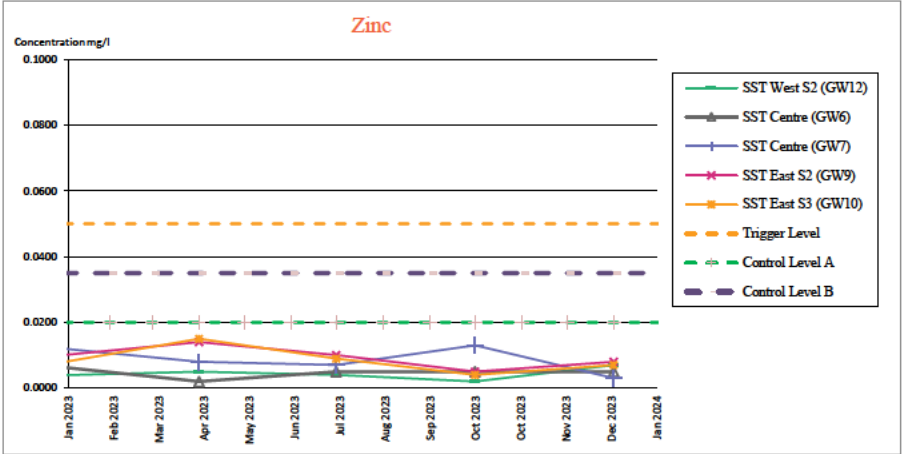
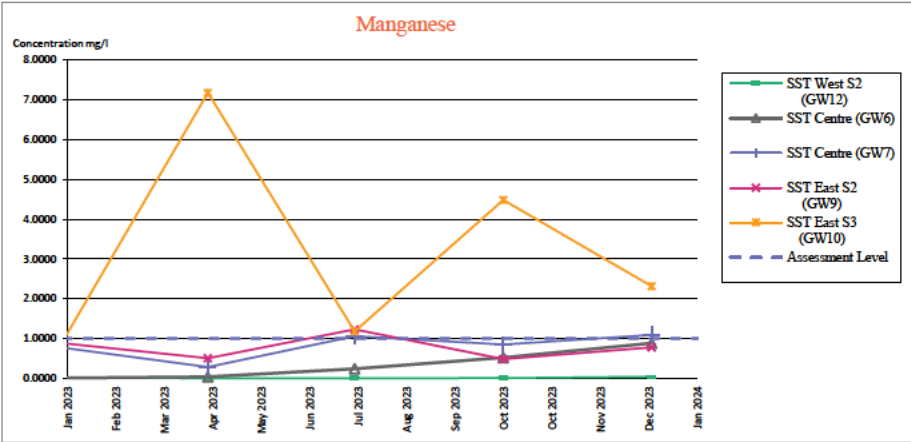


Figure A5
Groundwater quality monitoring results - Compliance wells graphs

Compliance wells graphs



Compliance wells graphs



Compliance wells graphs

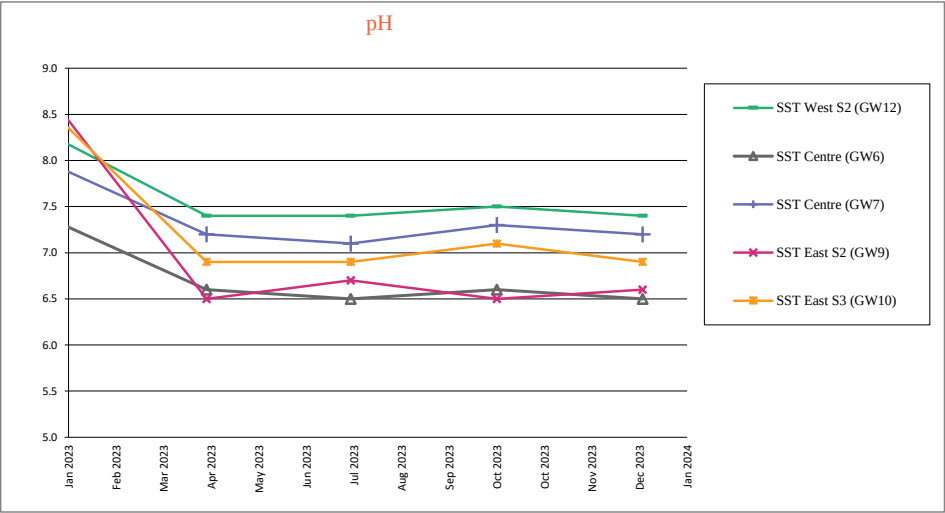


Figure A6
Groundwater quality monitoring results - Upstream wells graphs

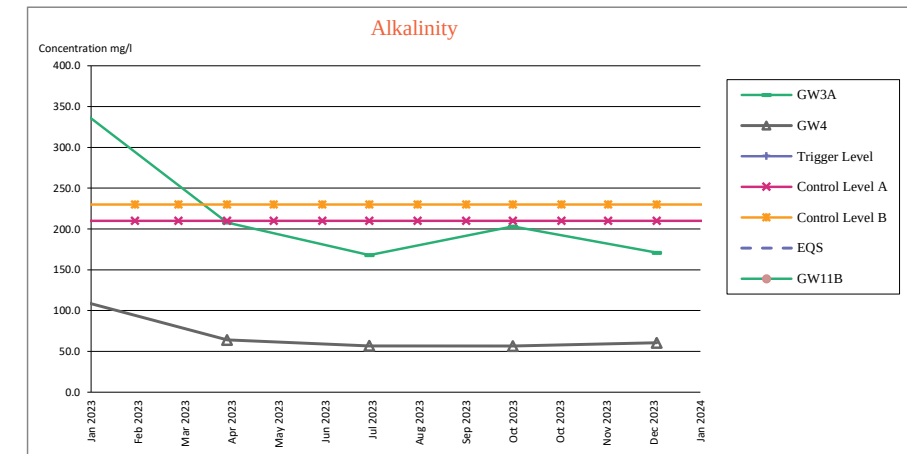
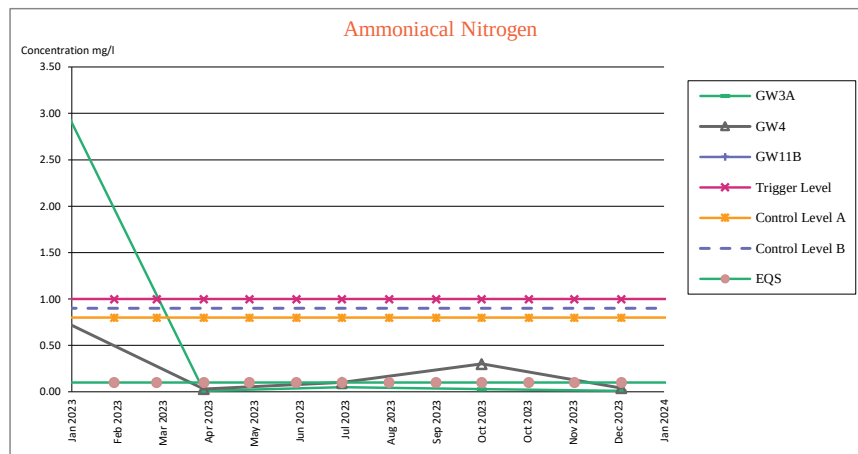
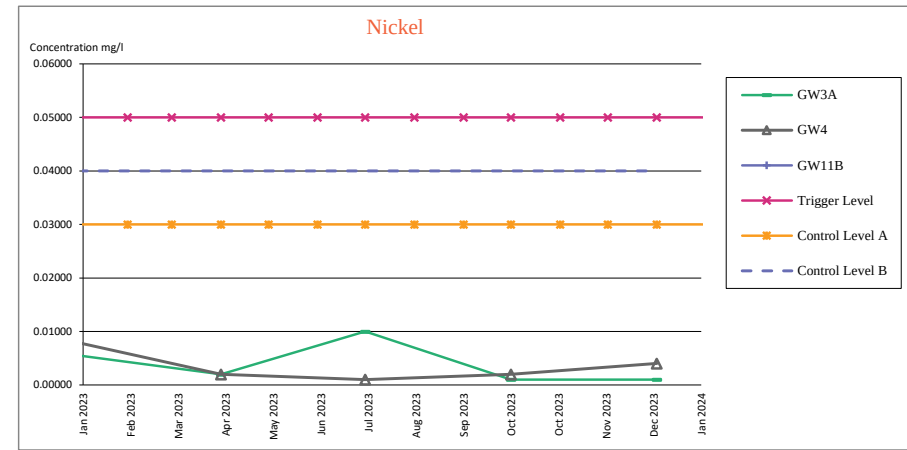
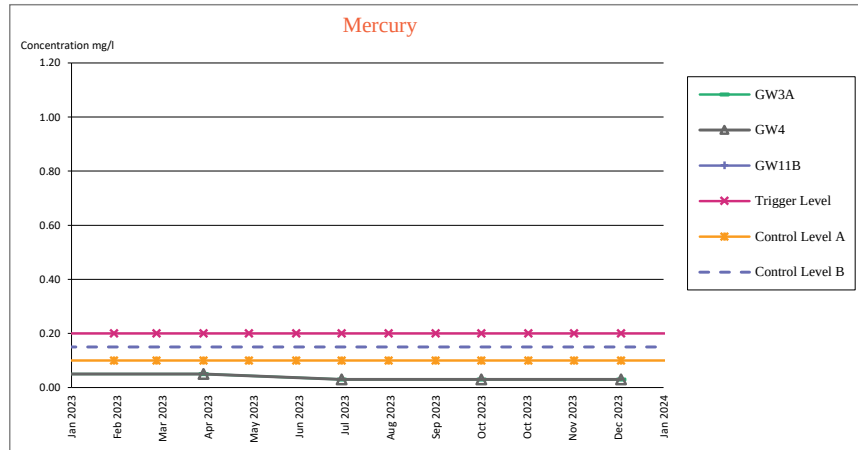
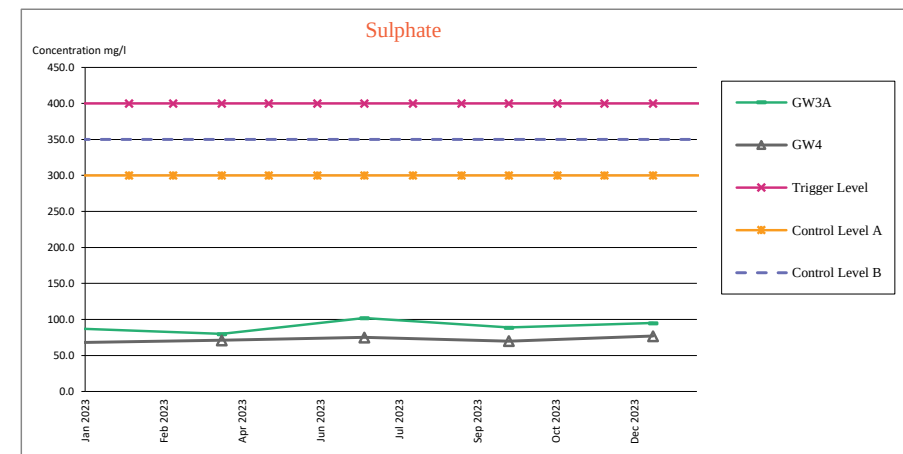
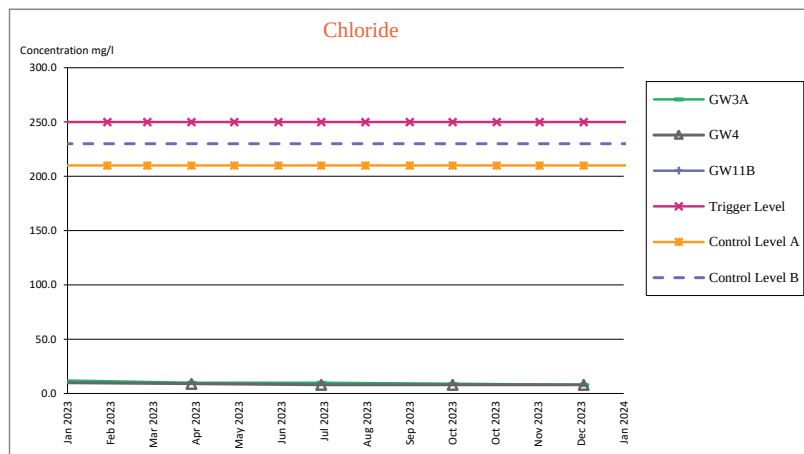
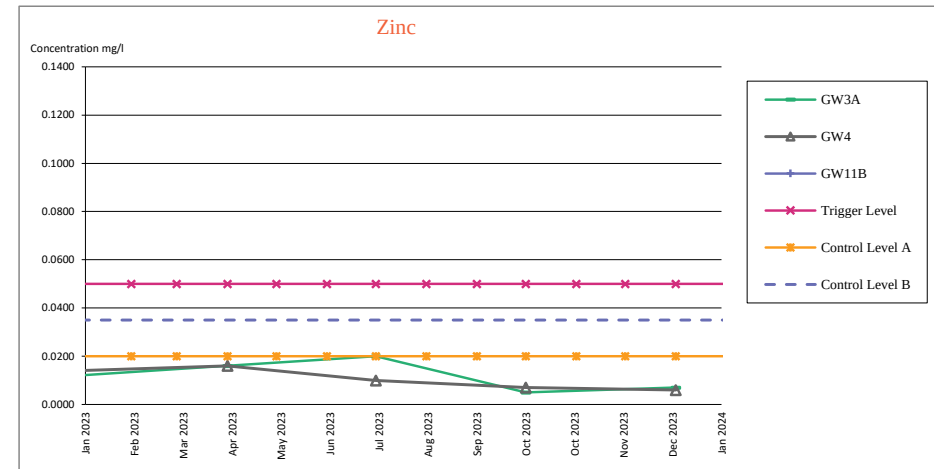
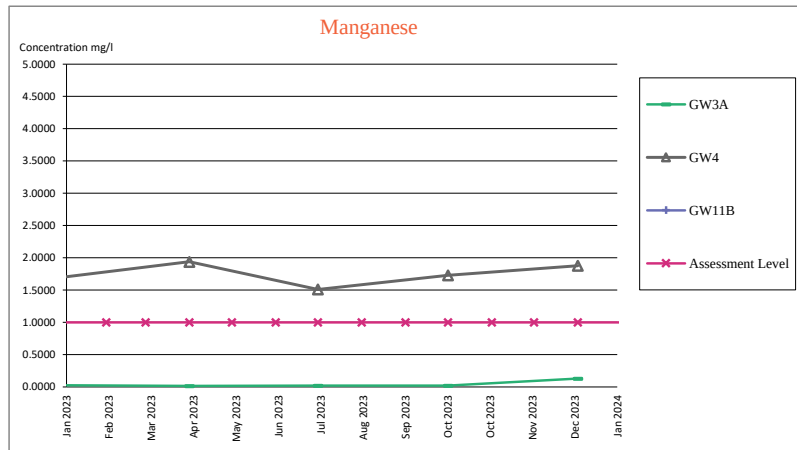
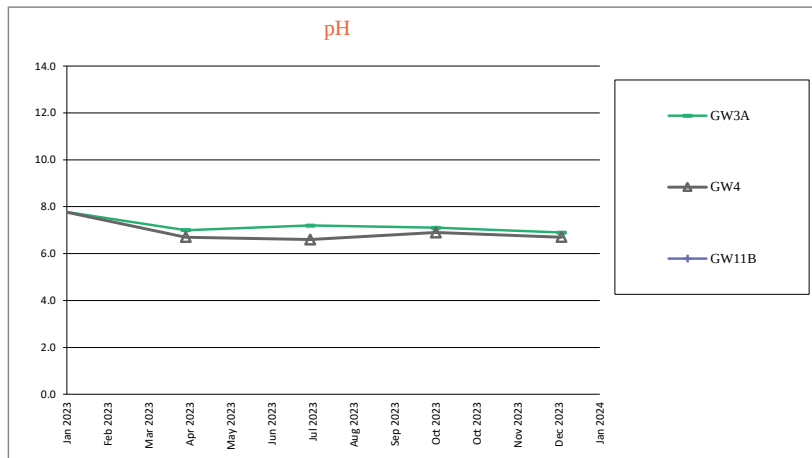


Figure A6
Groundwater quality monitoring results - Upstream wells graphs





Groundwater monitoring levels downstream of compliance wells

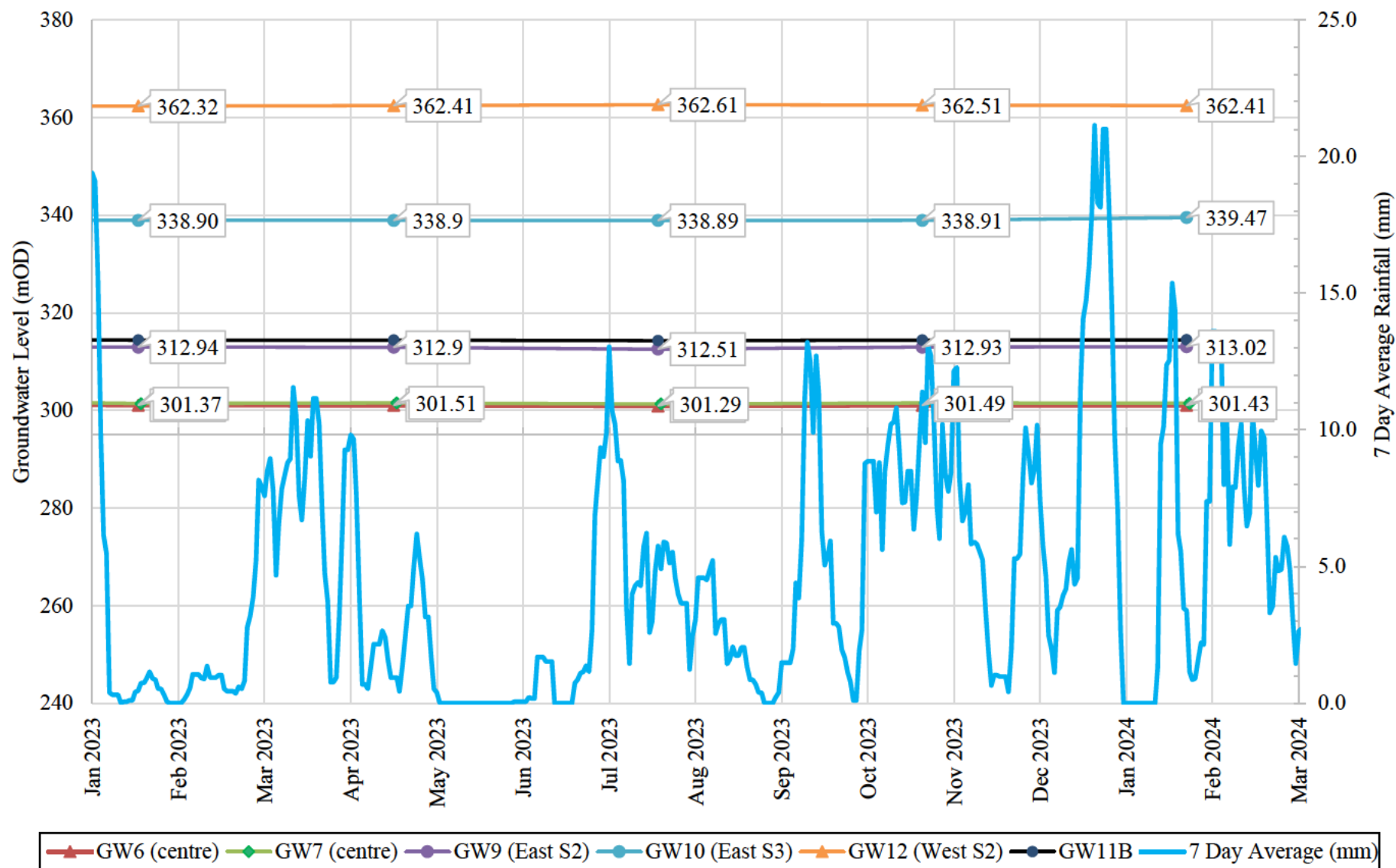
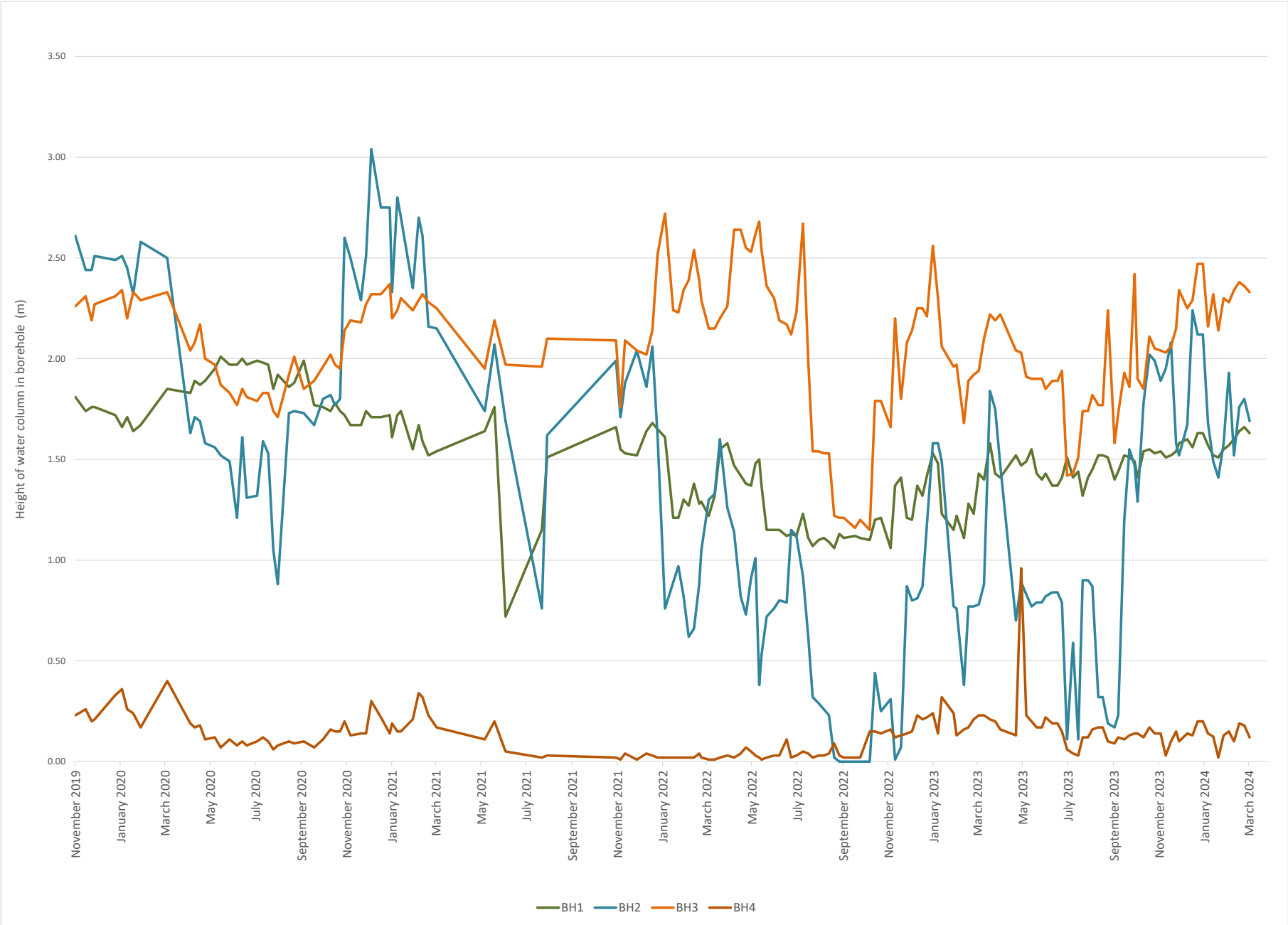


Figure A8
Height of water column (m) from base of well in boreholes BH1 to BH 4



Appendix B: Monitoring Results - Tables

Appendix B
Table B1
Leachate Monitoring Results

January 2024												
LOCATION	Units	L1A	L1B	LC1A	LC2A	LC4A	LC5B	Maximum concentration (mg/l)	Monthly Average (mg/l)	Acceptable Maximum Concentration (AMC) (mg/l)	LP3A	LP4
Date Sampled	-							-	-	-		
Manganese in filtrate as Mn	mg/l	N/S	0.663	N/S	0.085	0.722	0.357	0.722	0.43	--	0.013	0.078
Mercury, filt trace as Hg	mg/l	N/S	< 0.0000	N/S	< 0.00003	< 0.00003	< 0.0003	0.00003	0.0001	0.00056	< 0.00003	< 0.0003
Nickel in filtrate as Ni	mg/l	N/S	0.004	N/S	0.092	0.007	0.081	0.092	0.057	0.0681	0.003	0.004
Zinc, ultra-low filtered as Zn	mg/l	N/S	0.009	N/S	0.033	0.006	0.046	0.033	0.039	1.38	0.005	0.021
pH	pH Units	N/S	7.5	N/S	8.2	7.3	8.2	8.2	7.80	--	8.3	8.3
Conductivity- Electrical 20C	uS/cm	N/S	1530	N/S	12300	4030	11700	12300	2133	--	1320	1320
Alkalinity as CaCO3	mg/l	N/S	415	N/S	4790	2460	4870	4790	2637	--	403	403
Ammoniacal Nitrogen as N	mg/l	N/S	< 0.01	N/S	483	233	564	483	64	526	0.4	0.4
Chloride as Cl	mg/l	N/S	79	N/S	672	170	620	672	393	1408	80	80
Sulphate as SO4	mg/l	N/S	289	N/S	500	7	75	500	375	999	165	165
Redox Potential ^(see note 4)	mV	N/S	232.6	N/S	145.1	-76.2	49.5	232.6	-46	--	227.4	227.4
Total Suspended Solids	mg/l	N/S	5	N/S	2170	2400	2640	2400	326	--	< 5	< 5
Solids, Total Dissolved 180 deg C	mg/l	N/S	1150	N/S	5190	1770	4510	5190	1393	--	928	1140
Dissolved Oxygen, Fixed*	mg/l	N/S	10.1	N/S	4.5	2.3	0.4	-	-	--	11.5	10.5
TOC (filtered)	mg/l	N/S	10.6	N/S	326	2400	426	2400	137.7	--	9.07	9.07

Notes

- < denotes 'less than'.
- L1A,L1B, LC1A, LC2A,LC4A, LC5B: 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
- LC5B is a replacement for LC5A well.
- N/S denotes 'not sampled'.

Exceedance of AMC (per well)

Exceedance of AMC (monthly average)

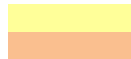


Table B2
Leachate Head Levels

		Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24
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)	40.38											
	Leachate elevation (mAOD)	358.47											
	Calculated leachate head (m)	0.85											
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)	35.54											
	Leachate elevation (mAOD)	365.58											
	Calculated leachate head (m)	3.09											
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)	26.77											
	Leachate elevation (mAOD)	374.37											
	Calculated leachate head (m)	2.10											
LC5B	Elevation of base of landfill mAOD	349.79											
	Elevation at top of casing mAOD	380.75											
	Depth to leachate from top of casing (m)	29.87											
	Leachate elevation (mAOD)	350.88											
	Calculated leachate head (m)	1.09											
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)	20.02											
	Base of well (m AOD)	336.98											
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)	20.95											
	Base of well (m AOD)	334.84											
L1B*	Casing height (mAOD)	354.80											
	Leachate (mbgl)	25.77											
	Leachate (m AOD)	329.03											
	Base of landfill (m AOD)	319.60											
	Depth of well from top of casing (m)	34.80											
	Base of well (m AOD)	320.00											
	Calculated leachate head (m)	9.43											

2024	Quarterly Leachate Head Averages (m)
January	2.01
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.

* 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	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 SW2AI SWW4	Six-monthly	Not sampled this quarter																						
	NW Ditch System	SWW1 SWW2	Six-monthly	Not sampled this quarter																						
	Downstream of Landfill	SWD SWD1	Quarterly	< 0.03 < 0.03	0.0100 < 0.0020	< 0.0010 0.0020	< 0.0001 < 0.0001	0.008 0.010	< 0.0001 < 0.0001	7.8 281	0.03 < 0.01	0.0003 0.0001	8.7 7.8	6.00 9.00	52.0 52.0	<5 <5	11 12	1.3 1.6	315.20 12.10	84 72	43 36					
	Upstream of Landfill	SWU SW2AI SWW4	Six-monthly																							
April	NW Ditch System	SWW1 SWW2	Six-monthly																							
	Downstream of Landfill	SWD SWD1	Quarterly																							
July	Upstream of Landfill	SWU SW2AI SWW4	Six-monthly	Not sampled this quarter																						
	NW Ditch System	SWW1 SWW2	Six-monthly	Not sampled this quarter																						
	Downstream of Landfill	SWD SWD1	Quarterly																							
October	Upstream of Landfill	SWU SW2AI SWW4	Six-monthly																							
	NW Ditch System	SWW1 SWW2	Six-monthly																							
	Downstream of Landfill	SWD SWD1	Quarterly																							
Minimum			<	0.0020	<	0.0010	<	0.0001	<	0.0080	<	0.0001	7.8	281	<	<	0.0001	7.8	6.0	52.0	11.3	0.0	1.3	12.1	72.4000	36.0000
Maximum			<	0.0100	<	0.0020	<	0.0001	<	0.0100	<	0.0001	7.8	293	<	<	0.0003	8.7	9	52	12	0.0	2	315	84	43
Count				2		2		2		2		2	2	2		2	2	0	2	2	2	2	2	2	2	

- 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 ^u)		0.05	(0.05 ^u)	--	--	--	1	--	--	250	400	--	--	--		
	Control Level A				(0.1 ^u)	--	0.03	(0.02 ^u)	--	--	--	0.8	--	--	210	300	--	--	--		
	Control Level B				(0.15 ^u)	--	0.04	(0.035 ^u)	--	--	--	0.9	--	--	230	350	--	--	--		
	Assessment Level				--	(1.0 ^u)	--	--	--	--	--	--	--	--	--	--	--	--	--		
UPSTREAM WELLS																					
SST East S3																					
GW3A	Jan-23	21/02/23	1597147	-150	<	0.05	0.0240	0.00550	0.0120	7.8	540.0	340.0	3.00	0.0434	13.0	12.0	87.0	76.0	8.7	4.9	
	Feb-23	Quarterly																			
	Mar-23																				
	Apr-23	04/05/23	23050829-006	235.8	<	0.05	0.016	0.00200	0.0160	7.0	556.0	208.0	0.01	0.0000	13.4	10.0	80.0	84.0	8.7	1.4	
	May-23	Quarterly																			
	Jun-23																				
	Jul-23	20/07/23	23072702-006	12.1	<	0.03	<	0.0200	<	0.0100	<	0.0200	0.05	0.0002	13.8	10.0	102.0	72.0	12.1	3.3	
	Aug-23	Quarterly																			
	Sep-23																				
	Oct-23	17/10/23	23102561-006	348.6	<	0.030	0.0190	<	0.001	0.0050	7.1	583.0	203	0.03	0.0001	13.5	9.0	89.0	84.0	8.8	4.0
	Nov-23	Quarterly																			
	Dec-23																				
GW3A	Jan-24	05/02/24	24020781-007	240	<	0.030	0.1300	<	0.00100	0.0070	6.9	528.0	171.0	<	0.01	0.00002	13.0	8.0	95.0	10.6	11.7
	Feb-24	Quarterly																			
	Mar-24																				
	Apr-24																				
	May-24																				
	Jun-24																				
	Jul-24																				
	Aug-24																				
	Sep-24																				
	Oct-24																				
	Nov-24																				
	Dec-24																				
GW4	Jan-23	21/02/23	1597148	-140	<	0.05	1.70	0.0079	0.0140	7.8	280.0	110.0	0.74	0.0083	9.5	9.9	68.0	21.0	7.5	3.5	
	Feb-23	Quarterly																			
	Mar-23																				
	Apr-23	04/05/23	23050829-007	270.9	<	0.050	1.94	0.0020	0.0160	6.7	285.0	64.0	0.03	0.0000	10.0	9.0	71.0	19.0	9.5	1.5	
	May-23	Quarterly																			
	Jun-23																				
	Jul-23	20/07/23	23072702-007	326.2	<	0.03	1.5100	0.0010	0.0100	6.6	301.0	56.8	0.10	0.0001	10.0	8.0	75.0	18.0	9.8	0.7	
	Aug-23	Quarterly																			
	Sep-23																				
	Oct-23	17/10/23	23102561-007	389.3	<	0.030	1.7300	0.002	0.0070	6.9	289.0	56.6	0.30	0.0004	9.6	8.0	70.0	17.0	7.8	4.0	
	Nov-23	Quarterly																			
	Dec-23																				
GW4	Jan-24	05/02/24	24020781-008	331	<	0.030	1.88	0.0040	0.0060	6.7	296.0	60.5	0.04	0.00004	9.3	8.0	77.0	18.0	8.1	6.7	
	Feb-24	Quarterly																			
	Mar-24																				
	Apr-24																				
	May-24																				
	Jun-24																				
	Jul-24																				
	Aug-24																				
	Sep-24																				
	Oct-24																				
	Nov-24																				
	Dec-24																				

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	Jan-23	21/02/23	1597153	-72	<	0.050	0.0090	0.0073	0.0039	8.2	1600.0	420.0	0.20	0.0111	19.2	83.0	270.0	150.0	7.3	10.0		
	Feb-23	Quarterly																				
	Mar-23																					
	Apr-23	04/05/23	23050829-012	287.9	<	0.050	<	0.002	0.0040	0.0050	7.4	1650.0	152.0	0.01	0.0001	19.2	87.0	240.0	151.0	8.9	15.1	
	May-23	Quarterly																				
	Jun-23																					
	Jul-23	20/07/23	23072702-012	11.2	<	0.03	<	0.0020	0.0040	0.0040	7.4	1810.0	434.0	<	0.10	0.0008	18.1	102.0	306.0	162.0	11.2	10.3
	Aug-23	Quarterly																				
	Sep-23																					
	Oct-23	17/10/23	23102561-012	315.5	<	0.030		0.0040	0.005	0.0020	7.5	1750.0	431	0.01	0.0001	18.7	96.0	270.0	156.0	9.1	9.1	
	Nov-23	Quarterly																				
	Dec-23																					
	GW12	Jan-24	05/02/24	24020781-013	316	<	0.030	0.0390	0.0040	0.0070	7.4	1450.0	384.0	0.01	0.0001	19.5	73.0	321.0	142.0	9.8	30.5	
		Feb-24	Quarterly																			
		Mar-24																				
		Apr-24																				
		May-24																				
		Jun-24																				
		Jul-24																				
		Aug-24																				
Sep-24																						
Oct-24																						
Nov-24																						
Dec-24																						
SST Centre																						
GW6	Jan-23	21/02/23	1597149	-120	<	0.050	0.0071	0.0067	0.0063	7.3	770.0	250.0	0.32	0.0013	11.7	73.0	83.0	34.0	8.5	6.5		
	Feb-23	Quarterly																				
	Mar-23																					
	Apr-23	04/05/23	23050829-008	289.1	<	0.050		0.04	0.003	0.002	6.6	952	319	0.08	0.0001	12.0	72	75	77	9	9.4	
	May-23	Quarterly																				
	Jun-23																					
	Jul-23	20/07/23	23072702-008	369.9	<	0.030		0.2410	0.0040	0.0050	6.5	893.0	248.0	0.02	0.00001	11.7	74.0	82.0	50.0	10.5	13.7	
	Aug-23	Quarterly																				
	Sep-23																					
	Oct-23	17/10/23	23102561-008	388.8	<	0.030		0.5220	0.005	0.0050	6.6	866.0	228	0.01	0.00001	11.7	73.0	75.0	42.0	8.5	<	4.0
	Nov-23	Quarterly																				
	Dec-23																					
GW6	Jan-24	05/02/24	24020781-009	335	<	0.030	0.8830	0.0050	0.0050	6.5	871.0	247.0	0.02	0.00001	12.5	71.0	83.0	49.0	9.6	6.2		
	Feb-24	Quarterly																				
	Mar-24																					
	Apr-24																					
	May-24																					
	Jun-24																					
	Jul-24																					
	Aug-24																					
	Sep-24																					
	Oct-24																					
	Nov-24																					
	Dec-24																					
GW7	Jan-23	21/02/23	1597150	-95	<	0.05	0.7700	0.0079	0.0120	7.9	830.0	380.0	0.26	0.004	11.7	46.0	110.0	76.0	7.8	8.0		
	Feb-23	Quarterly																				
	Mar-23																					
	Apr-23	04/05/23	23050829-009	284.8	<	0.050		0.282	0.0030	0.0080	7.2	714.0	731.0	0.02	0.000	11.6	28.0	78.0	74.0	8.7	4.3	
	May-23	Quarterly																				
	Jun-23																					
	Jul-23	20/07/23	23072702-009	349.5	<	0.030		1.0600	0.0030	0.0070	7.1	903.0	248.0	<	0.01	0.000	12.0	46.0	118.0	99.0	8.8	5.0
	Aug-23	Quarterly																				
	Sep-23																					
	Oct-23	17/10/23	23102561-009	347.5	<	0.030		0.8510	0.004	0.0130	7.3	914.0	327	1.20	0.0054	12.6	32.0	87.0	105.0	9.4	5.7	
	Nov-23	Quarterly																				
	Dec-23																					
GW7	Jan-24	05/02/24	24020781-010	308	<	0.030		1.0900	0.0030	0.0030	7.2	827.0	276.0	<	0.01	0.00003	12.3	36.0	91.0	94.0	9.6	5.5
	Feb-24	Quarterly																				
	Mar-24																					
	Apr-24																					
	May-24																					
	Jun-24																					
	Jul-24																					
	Aug-24																					
	Sep-24																					
	Oct-24																					
	Nov-24																					
	Dec-24																					

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*)	--	--	--	--	--	--	--	--	--	--	--	--	--		
SST East S2	GW9	Jan-23	21/02/23	1597151	-94	<	0.05	0.8800	0.0100	0.0100	8.5	7300.0	500.0	16.00	1.0	11.7	140.0	34.0	67.0	6.2	15.0
		Feb-23	Quarterly																		
		Mar-23																			
		Apr-23	04/05/23	23050829-010	268.1	<	0.05	0.505	0.0030	0.0140	6.5	697.0	431.0	3.60	0.003	13.4	55.0	31.0	43.0	7.6	12.6
		May-23	Quarterly																		
		Jun-23																			
		Jul-23	20/07/23	23072702-010	341.2	<	0.03	1.2300	0.0050	0.0100	6.7	1080.0	226.0	5.40	0.006	12.3	106.0	44.0	61.0	9.3	6.7
		Aug-23	Quarterly																		
		Sep-23																			
		Oct-23	17/10/23	23102561-010	390	<	0.030	0.4820	0.002	0.0050	6.5	553.0	82.6	1.40	0.001	12.1	36.0	22.0	30.0	5.6	5.4
		Nov-23	Quarterly																		
		Dec-23																			
	GW10	Jan-24	05/02/24	24020781-011	328	<	0.030	0.7750	0.0040	0.0080	6.6	868.0	173.0	4.70	0.004	11.6	63.0	24.0	48.0	8.6	10.8
		Feb-24	Quarterly																		
		Mar-24																			
		Apr-24																			
		May-24																			
		Jun-24																			
		Jul-24																			
		Aug-24																			
		Sep-24																			
		Oct-24																			
		Nov-24																			
		Dec-24																			
SST East S3	GW9	Jan-23	21/02/23	1597152	-67	<	0.05	0.9300	0.0095	0.0079	8.4	620.0	310.0	0.44	0.0208	10.8	26.0	50.0	66.0	7.0	7.4
		Feb-23	Quarterly																		
		Mar-23																			
		Apr-23	04/05/23	23050829-011	280.3	<	0.05	7.18	0.0120	0.0150	6.9	627.0	81.8	0.16	0.0002	10.6	21.0	49.0	74.0	8.4	15.6
		May-23	Quarterly																		
		Jun-23																			
		Jul-23	20/07/23	23072702-011	257.1	<	0.03	1.1800	0.0050	0.0090	6.9	615.0	214.0	0.40	0.0006	10.5	16.0	48.0	80.0	8.4	9.9
		Aug-23	Quarterly																		
		Sep-23																			
		Oct-23	17/10/23	23102561-011	238.2	<	0.030	4.4800	0.009	0.0040	7.1	589.0	238	2.60	0.0067	11.3	9.0	48.0	81.0	3.5	7.1
		Nov-23	Quarterly																		
		Dec-23																			
	GW10	Jan-24	05/02/24	24020781-012	333	<	0.030	2.3100	0.0080	0.0070	6.9	528.0	194.0	0.12	0.00020	11.4	14.0	37.0	72.0	7.9	47.4
		Feb-24	Quarterly																		
		Mar-24																			
		Apr-24																			
		May-24																			
		Jun-24																			
		Jul-24																			
		Aug-24																			
		Sep-24																			
		Oct-24																			
		Nov-24																			
		Dec-24																			

	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^{10.05-(0.0324*T C)+pH}), where T C is measured water temperature.
^ Ammonia result confirmed on duplicate analysis.

Table B5
Landfill Gas Monitoring Results

METHANE (% by Volume)														CARBON DIOXIDE (% by Volume)													
Location	Valve	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Comments	
GMW7	Yellow Valve	0	0	0										0	0.2	0.1										Yellow Valve,12 depth	
	White Valve	piezo damaged	piezo damaged	piezo damaged										piezo damaged	piezo damaged	piezo damaged										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										1.2	1.7	1										Red Valve, 26.3m depth	
	Yellow Valve	0	0	0										1.7	0.8	3.3										Yellow Valve,15m depth	
	White Valve	0	0	0										0.6	1.4	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	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		
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		
GMW13	Red Valve	0	0	1.1										1	1.1	1.1										Red Valve, 26.3m depth	
	Yellow Valve	0	0	0										2.7	2.8	2.6										Yellow Valve,15m depth	
	White Valve	0	0	0										1.6	1.9	1.1										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	
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		
GMW14/14A	Red Valve	0	0	0.9										1	0.7	20.8										Red Valve, 26.3m depth	
	Yellow Valve	0	0	0.7										2.1	3.4	21.2										Yellow Valve,15m depth	
	White Valve	0	0	0.6										0.3	0.4	21.4										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	
	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		
GMW1**	Red Valve	0	0.1	0										0.4	0.9	0										Red Valve, 23.5m depth	
	Yellow Valve	0.9	1.5	0.8										1.4	1.8	1.7										Yellow Valve, 14.7m depth	
	White Valve	0.3	0.3	0.4										1.2	1.5	1.6										White Valve, 6.5m depth	
GMW8*	Yellow Valve	9.6	11.1	11.8										6.2	6	6.3										Yellow Valve,17.5m depth	
	White Valve	0	0	0										3.9	4	4.1										White Valve, 5.7m depth	
GMW9*	Red Valve	0	0	0										1.7	1.8	1.9										Red Valve, 27m depth	
	Yellow Valve	27.5	29.3	31.6										7.9	8.2	8.5										Yellow Valve,15m depth	
	White Valve	0.1	0.1	0.1										0	0.1	0.1										White Valve, 8.5m depth	
GMW10*	Red Valve	1.1	0.1	4.4										2.8	4.5	1										Red Valve, 19.5m depth	
	Yellow Valve	16	7.2	23.9										2	1.9	2.4										Yellow Valve,15m depth	
	White Valve	8.7	27.2	0.1										3.6	2.9	4										White Valve, 8m depth	
GMW17**	Red Valve	0	0	1.5										0.7	0	15.9										Red Valve, 26.3m depth	
	Yellow Valve	0	0	5.4										5.2	5.3	10.7										Yellow Valve,15m depth	
	White Valve	0	0	3.5										3.6	4	17.5										White Valve, 5m depth	
GMW18**	Yellow Valve	0	0	0										0	0.2	21.6										Yellow Valve,12 depth	
	White Valve	0	0	6										5.4	5.4	17.2										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

Table B6
BSC Pipe Monitoring

Date	BH1		BH2		BH3		BH4		Water column (m)			
	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base(m)	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base (m)	BH1	BH2	BH3	BH4
21/11/2019	18.24	20.05	6.11	8.72	4.51	6.77	9.89	10.12	1.81	2.61	2.26	0.23
05/12/2019	18.31	20.05	6.26	8.70	4.44	6.75	9.86	10.12	1.74	2.44	2.31	0.26
13/12/2019	18.28	20.04	6.26	8.70	4.57	6.76	9.91	10.11	1.76	2.44	2.19	0.20
17/12/2019	18.28	20.04	6.19	8.70	4.49	6.76	9.90	10.11	1.76	2.51	2.27	0.21
14/01/2020	18.32	20.04	6.21	8.70	4.45	6.76	9.79	10.12	1.72	2.49	2.31	0.33
23/01/2020	18.38	20.04	6.19	8.70	4.42	6.76	9.76	10.12	1.66	2.51	2.34	0.36
30/01/2020	18.33	20.04	6.27	8.72	4.57	6.77	9.86	10.12	1.71	2.45	2.20	0.26
07/02/2020	18.40	20.04	6.40	8.72	4.44	6.77	9.88	10.12	1.64	2.32	2.33	0.24
17/02/2020	18.37	20.04	6.14	8.72	4.48	6.77	9.95	10.12	1.67	2.58	2.29	0.17
24/03/2020	18.19	20.04	6.22	8.72	4.44	6.77	9.72	10.12	1.85	2.50	2.33	0.40
24/04/2020	18.20	20.03	7.08	8.71	4.73	6.77	9.93	10.12	1.83	1.63	2.04	0.19
30/04/2020	18.14	20.03	7.00	8.71	4.69	6.77	9.95	10.12	1.89	1.71	2.08	0.17
07/05/2020	18.16	20.03	7.02	8.71	4.60	6.77	9.94	10.12	1.87	1.69	2.17	0.18
14/05/2020	18.14	20.03	7.13	8.71	4.77	6.77	10.01	10.12	1.89	1.58	2.00	0.11
27/05/2020	18.08	20.03	7.15	8.71	4.80	6.77	10.00	10.12	1.95	1.56	1.97	0.12
04/06/2020	18.08	20.09	7.20	8.72	4.90	6.77	10.05	10.12	2.01	1.52	1.87	0.07
16/06/2020	18.07	20.04	7.24	8.73	4.94	6.77	10.02	10.13	1.97	1.49	1.83	0.11
26/06/2020	18.12	20.09	7.51	8.72	5.00	6.77	10.04	10.12	1.97	1.21	1.77	0.08
03/07/2020	18.09	20.09	7.10	8.71	4.92	6.77	10.02	10.12	2.00	1.61	1.85	0.10
09/07/2020	18.07	20.04	7.41	8.72	4.96	6.77	10.04	10.12	1.97	1.31	1.81	0.08
23/07/2020	18.05	20.04	7.40	8.72	4.98	6.77	10.02	10.12	1.99	1.32	1.79	0.10
31/07/2020	18.06	20.04	7.13	8.72	4.94	6.77	10.02	10.14	1.98	1.59	1.83	0.12
07/08/2020	18.07	20.04	7.19	8.72	4.94	6.77	10.02	10.12	1.97	1.53	1.83	0.10
14/08/2020	18.19	20.04	7.67	8.72	5.03	6.77	10.06	10.12	1.85	1.05	1.74	0.06
20/08/2020	18.17	20.09	7.83	8.71	5.06	6.77	10.05	10.13	1.92	0.88	1.71	0.08
04/09/2020	18.18	20.04	6.99	8.72	4.85	6.77	10.02	10.12	1.86	1.73	1.92	0.10

Table B6
BSC Pipe Monitoring

Date	BH1		BH2		BH3		BH4		Water column (m)			
	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base(m)	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base (m)	BH1	BH2	BH3	BH4
11/09/2020	18.21	20.09	6.97	8.71	4.76	6.77	10.03	10.12	1.88	1.74	2.01	0.09
24/09/2020	18.10	20.09	6.98	8.71	4.92	6.77	10.02	10.12	1.99	1.73	1.85	0.10
08/10/2020	18.28	20.05	7.05	8.72	4.88	6.77	10.06	10.13	1.77	1.67	1.89	0.07
20/10/2020	18.29	20.05	6.92	8.72	4.81	6.77	10.01	10.12	1.76	1.80	1.96	0.11
30/10/2020	18.30	20.04	6.90	8.72	4.75	6.77	9.96	10.12	1.74	1.82	2.02	0.16
05/11/2020	18.26	20.04	6.94	8.71	4.80	6.77	9.97	10.12	1.78	1.77	1.97	0.15
12/11/2020	18.30	20.04	6.92	8.72	4.82	6.77	9.98	10.13	1.74	1.80	1.95	0.15
18/11/2020	18.32	20.04	6.12	8.72	4.63	6.77	9.93	10.13	1.72	2.60	2.14	0.20
26/11/2020	18.37	20.04	6.22	8.72	4.58	6.77	9.99	10.12	1.67	2.50	2.19	0.13
10/12/2020	18.37	20.04	6.43	8.72	4.59	6.77	9.98	10.12	1.67	2.29	2.18	0.14
17/12/2020	18.30	20.04	6.21	8.72	4.50	6.77	9.98	10.12	1.74	2.51	2.27	0.14
24/12/2020	18.33	20.04	5.68	8.72	4.45	6.77	9.82	10.12	1.71	3.04	2.32	0.30
06/01/2021	18.35	20.06	5.97	8.72	4.45	6.77	9.90	10.12	1.71	2.75	2.32	0.22
18/01/2021	18.30	20.02	5.97	8.72	4.40	6.77	9.98	10.12	1.72	2.75	2.37	0.14
21/01/2021	18.42	20.03	6.37	8.70	4.56	6.76	9.93	10.12	1.61	2.33	2.20	0.19
28/01/2021	18.32	20.04	5.90	8.70	4.53	6.77	9.97	10.12	1.72	2.80	2.24	0.15
02/02/2021	18.30	20.04	6.00	8.70	4.47	6.77	9.97	10.12	1.74	2.70	2.30	0.15
18/02/2021	18.49	20.04	6.37	8.72	4.53	6.77	9.92	10.13	1.55	2.35	2.24	0.21
26/02/2021	18.35	20.02	6.00	8.70	4.48	6.77	9.77	10.11	1.67	2.70	2.29	0.34
03/03/2021	18.43	20.02	6.09	8.70	4.45	6.77	9.79	10.11	1.59	2.61	2.32	0.32
11/03/2021	18.50	20.02	6.55	8.71	4.49	6.77	9.89	10.12	1.52	2.16	2.28	0.23
22/03/2021	18.49	20.03	6.55	8.70	4.52	6.77	9.94	10.11	1.54	2.15	2.25	0.17
26/05/2021	18.40	20.04	6.98	8.72	4.82	6.77	10.02	10.13	1.64	1.74	1.95	0.11
08/06/2021	18.28	20.04	6.64	8.71	4.58	6.77	9.92	10.12	1.76	2.07	2.19	0.20
23/06/2021	19.32	20.04	7.02	8.71	4.80	6.77	10.07	10.12	0.72	1.69	1.97	0.05
11/08/2021	18.87	20.02	7.92	8.68	4.79	6.75	10.09	10.11	1.15	0.76	1.96	0.02

Table B6
BSC Pipe Monitoring

Date	BH1		BH2		BH3		BH4		Water column (m)			
	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base(m)	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base (m)	BH1	BH2	BH3	BH4
18/08/2021	18.51	20.02	7.10	8.72	4.65	6.75	10.09	10.12	1.51	1.62	2.10	0.03
19/11/2021	18.37	20.03	6.70	8.69	4.67	6.76	10.09	10.11	1.66	1.99	2.09	0.02
25/11/2021	18.48	20.03	7.01	8.72	4.98	6.74	10.11	10.12	1.55	1.71	1.76	0.01
01/12/2021	18.49	20.02	6.79	8.67	4.65	6.74	10.08	10.12	1.53	1.88	2.09	0.04
17/12/2021	18.50	20.02	6.64	8.68	4.70	6.74	10.11	10.12	1.52	2.04	2.04	0.01
30/12/2021	18.39	20.03	6.85	8.71	4.71	6.73	10.09	10.13	1.64	1.86	2.02	0.04
07/01/2022	18.35	20.03	6.65	8.71	4.59	6.73	10.09	10.12	1.68	2.06	2.14	0.03
14/01/2022	18.38	20.03	7.10	8.71	4.21	6.73	10.10	10.12	1.65	1.61	2.52	0.02
24/01/2022	18.41	20.02	7.95	8.71	4.01	6.73	10.10	10.12	1.61	0.76	2.72	0.02
04/02/2022	18.81	20.02	7.83	8.72	4.50	6.74	10.10	10.12	1.21	0.89	2.24	0.02
11/02/2022	18.82	20.03	7.75	8.72	4.51	6.74	10.10	10.12	1.21	0.97	2.23	0.02
18/02/2022	18.73	20.03	7.90	8.72	4.40	6.74	10.10	10.12	1.30	0.82	2.34	0.02
25/02/2022	18.75	20.02	8.10	8.72	4.35	6.74	10.1	10.12	1.27	0.62	2.39	0.02
04/03/2022	18.65	20.03	8.06	8.72	4.20	6.74	10.11	10.13	1.38	0.66	2.54	0.02
11/03/2022	18.75	20.03	7.84	8.72	4.35	6.74	10.09	10.13	1.28	0.88	2.39	0.04
14/03/2022	18.73	20.02	7.68	8.73	4.45	6.74	10.09	10.11	1.29	1.05	2.29	0.02
24/03/2022	18.81	20.03	7.41	8.71	4.61	6.76	10.11	10.12	1.22	1.30	2.15	0.01
01/04/2022	18.71	20.03	7.38	8.71	4.60	6.75	10.11	10.12	1.32	1.33	2.15	0.01
08/04/2022	18.48	20.03	7.10	8.7	4.54	6.74	10.1	10.12	1.55	1.60	2.20	0.02
18/04/2022	18.44	20.02	7.45	8.71	4.48	6.74	10.09	10.12	1.58	1.26	2.26	0.03
27/04/2022	18.55	20.02	7.58	8.72	4.10	6.74	10.09	10.11	1.47	1.14	2.64	0.02
06/05/2022	18.60	20.02	7.90	8.72	4.11	6.75	10.07	10.11	1.42	0.82	2.64	0.04
13/05/2022	18.65	20.03	7.99	8.72	4.20	6.75	10.05	10.12	1.38	0.73	2.55	0.07
20/05/2022	18.66	20.03	7.81	8.72	4.21	6.74	10.07	10.12	1.37	0.91	2.53	0.05
26/05/2022	18.55	20.03	7.71	8.72	4.12	6.74	10.09	10.12	1.48	1.01	2.62	0.03
31/05/2022	18.53	20.03	8.34	8.72	4.06	6.74	10.11	10.13	1.50	0.38	2.68	0.02

Table B6
BSC Pipe Monitoring

Date	BH1		BH2		BH3		BH4		Water column (m)			
	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base(m)	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base (m)	BH1	BH2	BH3	BH4
03/06/2022	18.65	20.02	8.19	8.72	4.20	6.74	10.11	10.12	1.37	0.53	2.54	0.01
10/06/2022	18.88	20.03	7.99	8.71	4.40	6.76	10.11	10.13	1.15	0.72	2.36	0.02
20/06/2022	18.88	20.03	7.95	8.71	4.45	6.75	10.09	10.12	1.15	0.76	2.30	0.03
27/06/2022	18.87	20.02	7.90	8.70	4.55	6.74	10.09	10.12	1.15	0.80	2.19	0.03
07/07/2022	18.91	20.03	7.91	8.70	4.57	6.74	10.01	10.12	1.12	0.79	2.17	0.11
13/07/2022	18.90	20.03	7.57	8.72	4.62	6.74	10.11	10.13	1.13	1.15	2.12	0.02
20/07/2022	18.91	20.03	7.60	8.72	4.51	6.74	10.10	10.13	1.12	1.12	2.23	0.03
29/07/2022	18.80	20.03	7.80	8.72	4.07	6.74	10.08	10.13	1.23	0.92	2.67	0.05
05/08/2022	18.92	20.03	8.10	8.72	4.75	6.74	10.09	10.13	1.11	0.62	1.99	0.04
11/08/2022	18.95	20.02	8.39	8.71	5.20	6.74	10.11	10.13	1.07	0.32	1.54	0.02
19/08/2022	18.92	20.02	8.42	8.71	5.20	6.74	10.10	10.13	1.10	0.29	1.54	0.03
26/08/2022	18.91	20.02	8.46	8.72	5.21	6.74	10.09	10.12	1.11	0.26	1.53	0.03
02/09/2022	18.93	20.02	8.49	8.72	5.21	6.74	10.09	10.13	1.09	0.23	1.53	0.04
09/09/2022	18.97	20.03	8.69	8.71	5.52	6.74	10.09	10.18	1.06	0.02	1.22	0.09
16/09/2022	18.90	20.03	8.71	8.71	5.53	6.74	10.11	10.14	1.13	0.00	1.21	0.03
22/09/2022	18.91	20.02	8.71	8.71	5.53	6.74	10.10	10.12	1.11	0.00	1.21	0.02
07/10/2022	18.90	20.02	8.71	8.71	5.58	6.74	10.10	10.12	1.12	0.00	1.16	0.02
14/10/2022	18.92	20.03	8.68	8.68	5.56	6.76	10.11	10.13	1.11	0.00	1.20	0.02
27/10/2022	18.92	20.02	8.68	8.68	5.61	6.76	9.98	10.13	1.10	0.00	1.15	0.15
03/11/2022	18.82	20.02	8.24	8.68	4.97	6.76	9.97	10.12	1.20	0.44	1.79	0.15
11/11/2022	18.80	20.01	8.40	8.65	4.97	6.76	9.98	10.12	1.21	0.25	1.79	0.14
24/11/2022	18.95	20.01	8.36	8.67	5.10	6.76	9.97	10.13	1.06	0.31	1.66	0.16
30/11/2022	18.64	20.01	8.69	8.70	4.56	6.76	10.01	10.13	1.37	0.01	2.20	0.12
08/12/2022	18.60	20.01	8.61	8.68	4.97	6.77	9.99	10.12	1.41	0.07	1.80	0.13
16/12/2022	18.82	20.03	7.80	8.67	4.67	6.75	9.98	10.12	1.21	0.87	2.08	0.14
23/12/2022	18.82	20.02	7.87	8.67	4.63	6.77	9.97	10.12	1.20	0.80	2.14	0.15

Table B6
BSC Pipe Monitoring

Date	BH1		BH2		BH3		BH4		Water column (m)			
	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base(m)	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base (m)	BH1	BH2	BH3	BH4
30/12/2022	18.65	20.02	7.81	8.62	4.51	6.76	9.90	10.13	1.37	0.81	2.25	0.23
06/01/2023	18.70	20.02	7.81	8.68	4.51	6.76	9.91	10.12	1.32	0.87	2.25	0.21
12/01/2023	18.60	20.02	7.50	8.68	4.55	6.76	9.90	10.12	1.42	1.18	2.21	0.22
20/01/2023	18.50	20.03	7.10	8.68	4.20	6.76	9.89	10.13	1.53	1.58	2.56	0.24
27/01/2023	18.55	20.03	7.10	8.68	4.46	6.76	9.98	10.12	1.48	1.58	2.30	0.14
01/02/2023	18.80	20.03	7.19	8.68	4.70	6.76	9.80	10.12	1.23	1.49	2.06	0.32
17/02/2023	18.87	20.02	7.91	8.68	4.80	6.76	9.88	10.12	1.15	0.77	1.96	0.24
21/02/2023	18.81	20.03	7.90	8.66	4.80	6.77	9.99	10.12	1.22	0.76	1.97	0.13
03/03/2023	18.91	20.02	8.30	8.68	5.08	6.76	9.95	10.11	1.11	0.38	1.68	0.16
09/03/2023	18.75	20.03	7.90	8.67	4.88	6.77	9.94	10.11	1.28	0.77	1.89	0.17
16/03/2023	18.80	20.03	7.90	8.67	4.85	6.77	9.91	10.12	1.23	0.77	1.92	0.21
23/03/2023	18.60	20.03	7.90	8.68	4.80	6.74	9.90	10.13	1.43	0.78	1.94	0.23
30/03/2023	18.62	20.02	7.80	8.68	4.64	6.74	9.89	10.12	1.40	0.88	2.10	0.23
07/04/2023	18.45	20.03	6.83	8.67	4.52	6.74	9.92	10.13	1.58	1.84	2.22	0.21
14/04/2023	18.59	20.02	6.92	8.67	4.55	6.74	9.92	10.12	1.43	1.75	2.19	0.20
21/04/2023	18.61	20.02	7.15	8.62	4.52	6.74	9.96	10.12	1.41	1.47	2.22	0.16
12/05/2023	18.56	20.08	7.96	8.66	4.70	6.74	9.99	10.12	1.52	0.70	2.04	0.13
19/05/2023	18.51	19.98	7.80	8.69	4.71	6.74	9.99	10.95	1.47	0.89	2.03	0.96
26/05/2023	18.53	20.02	7.85	8.68	4.83	6.74	9.90	10.13	1.49	0.83	1.91	0.23
02/06/2023	18.48	20.03	7.91	8.68	4.86	6.76	9.93	10.13	1.55	0.77	1.90	0.20
09/06/2023	18.59	20.02	7.98	8.77	4.84	6.74	9.95	10.12	1.43	0.79	1.90	0.17
16/06/2023	18.62	20.02	7.98	8.77	4.84	6.74	9.95	10.12	1.40	0.79	1.90	0.17
21/06/2023	18.60	20.03	7.86	8.68	4.89	6.74	9.90	10.12	1.43	0.82	1.85	0.22
30/06/2023	18.65	20.02	7.85	8.69	4.85	6.74	9.94	10.13	1.37	0.84	1.89	0.19
07/07/2023	18.65	20.02	7.85	8.69	4.85	6.74	9.94	10.13	1.37	0.84	1.89	0.19
13/07/2023	18.61	20.02	7.90	8.69	4.80	6.74	9.98	10.13	1.41	0.79	1.94	0.15

Table B6
BSC Pipe Monitoring

Date	BH1		BH2		BH3		BH4		Water column (m)			
	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base(m)	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base (m)	BH1	BH2	BH3	BH4
20/07/2023	18.51	20.02	8.59	8.70	5.33	6.75	10.08	10.14	1.51	0.11	1.42	0.06
28/07/2023	18.60	20.01	8.10	8.69	5.31	6.74	10.09	10.13	1.41	0.59	1.43	0.04
04/08/2023	18.57	20.01	8.60	8.71	5.23	6.74	10.07	10.10	1.44	0.11	1.51	0.03
10/08/2023	18.70	20.02	7.79	8.69	4.98	6.72	10.01	10.13	1.32	0.90	1.74	0.12
17/08/2023	18.60	20.01	7.79	8.69	4.98	6.72	10.01	10.13	1.41	0.90	1.74	0.12
23/08/2023	18.56	20.01	7.80	8.67	4.92	6.74	9.96	10.12	1.45	0.87	1.82	0.16
31/08/2023	18.49	20.01	8.35	8.67	4.95	6.72	9.96	10.13	1.52	0.32	1.77	0.17
06/09/2023	18.49	20.01	8.35	8.67	4.95	6.72	9.96	10.13	1.52	0.32	1.77	0.17
13/09/2023	18.51	20.02	8.50	8.69	4.50	6.74	10.02	10.12	1.51	0.19	2.24	0.10
22/09/2023	18.62	20.02	8.52	8.69	5.15	6.73	10.03	10.12	1.40	0.17	1.58	0.09
27/09/2023	18.59	20.03	8.46	8.69	5.00	6.73	10.01	10.13	1.44	0.23	1.73	0.12
05/10/2023	18.50	20.02	7.49	8.69	4.80	6.73	10.01	10.12	1.52	1.20	1.93	0.11
12/10/2023	18.50	20.01	7.14	8.69	4.86	6.72	9.99	10.12	1.51	1.55	1.86	0.13
19/10/2023	18.52	20.01	7.14	8.61	4.30	6.72	9.99	10.13	1.49	1.47	2.42	0.14
23/10/2023	18.60	20.01	7.40	8.69	4.82	6.72	9.98	10.12	1.41	1.29	1.90	0.14
31/10/2023	18.49	20.03	6.91	8.69	4.88	6.73	10.01	10.13	1.54	1.78	1.85	0.12
08/11/2023	18.48	20.03	6.67	8.69	4.62	6.73	9.96	10.13	1.55	2.02	2.11	0.17
15/11/2023	18.50	20.03	6.70	8.69	4.68	6.73	9.99	10.13	1.53	1.99	2.05	0.14
23/11/2023	18.48	20.02	6.80	8.69	4.68	6.72	9.98	10.12	1.54	1.89	2.04	0.14
30/11/2023	18.51	20.02	6.72	8.67	4.70	6.73	10.10	10.13	1.51	1.95	2.03	0.03
07/12/2023	18.51	20.03	6.81	8.89	4.66	6.72	10.02	10.12	1.52	2.08	2.06	0.10
14/12/2023	18.48	20.02	7.10	8.68	4.58	6.73	9.97	10.12	1.54	1.58	2.15	0.15
18/12/2023	18.42	20.00	7.16	8.68	4.41	6.75	10.00	10.10	1.58	1.52	2.34	0.10
29/12/2023	18.43	20.03	7.01	8.68	4.50	6.75	9.98	10.12	1.60	1.67	2.25	0.14
05/01/2024	18.46	20.02	6.45	8.69	4.44	6.73	9.99	10.12	1.56	2.24	2.29	0.13
12/01/2024	18.39	20.02	6.56	8.68	4.27	6.74	9.90	10.10	1.63	2.12	2.47	0.20

Table B6
BSC Pipe Monitoring

Date	BH1		BH2		BH3		BH4		Water column (m)			
	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base(m)	Water level depth (m)	Well depth to base (m)	Water level depth (m)	Well depth to base (m)	BH1	BH2	BH3	BH4
19/01/2024	18.39	20.02	6.56	8.68	4.27	6.74	9.90	10.10	1.63	2.12	2.47	0.20
26/01/2024	18.46	20.03	7.01	8.69	4.58	6.74	9.98	10.12	1.57	1.68	2.16	0.14
02/02/2024	18.50	20.02	7.19	8.68	4.42	6.74	10.00	10.12	1.52	1.49	2.32	0.12
09/02/2024	18.51	20.02	7.27	8.68	4.60	6.74	10.10	10.12	1.51	1.41	2.14	0.02
16/02/2024	18.47	20.02	7.10	8.68	4.44	6.74	9.99	10.12	1.55	1.58	2.30	0.13
23/02/2024	18.46	20.03	6.75	8.68	4.46	6.74	9.97	10.12	1.57	1.93	2.28	0.15
01/03/2024	18.42	20.02	7.16	8.68	4.40	6.74	10.00	10.10	1.60	1.52	2.34	0.10
08/03/2024	18.39	20.03	6.92	8.68	4.36	6.74	9.94	10.13	1.64	1.76	2.38	0.19
15/03/2024	18.37	20.03	6.88	8.68	4.38	6.74	9.95	10.13	1.66	1.80	2.36	0.18
22/03/2024	18.40	20.03	6.99	8.68	4.41	6.74	9.90	10.02	1.63	1.69	2.33	0.12