

Blaenau Gwent County Borough Council

Silent Valley Landfill

2024 Annual and Fourth Quarter Monitoring Report

Reference: 4-50

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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 2024 Annual Monitoring Report presents the surface water, groundwater, landfill gas and leachate results for the monitoring undertaken in the period January to December 2024 in accordance with Silent Valley Environmental Permit ^[1] (Permit no. MP3835SV) and the Aftercare Phase Environmental and Infrastructure Monitoring Program^[6].

This report also includes the Fourth Quarter Monitoring results for the period October to December 2024.

The data has been collected as referenced in Schedule 3 of the Consolidated Permit ^[1]. This report refers to the 2024 Third Quarter Monitoring Report ^[3] and 2023 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 A, Figures A1 and A2**.

Fourth Quarter Summary

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

- November recorded the most rainfall with 146.6mm in total. November also recorded the highest daily rainfall total 50mm on the 23rd and 50.4mm on the 24th. Over half the rainfall in November occurred over a period of 48 hours.
- October was the driest month of the quarter, recording 131.4mm, around average for this time of year in comparison to 2008-2023 records.

Annual Summary

The combined rainfall total for the year 2024 is 1,570mm. This is lower than the previous year of 1,642mm. The annual total continues to exceed the long-term average for the region of 1,260mm^[7].

Nine of the twelve months recorded monthly rainfall exceeding 100mm with the highest monthly total recorded in September (159mm), this is the highest September rainfall recording since records began in 2008. June was the driest month with a monthly total of 29mm.

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**.

To assess compliance, the Allowable Maximum Concentrations (AMC) are compared with the overall average concentrations from all combined wells.

Fourth Quarter Summary

No average leachate concentrations have exceeded the AMC this quarter and therefore this is compliant with the Permit.

Annual Summary

The overall average well concentrations for the monitored contaminants have been recorded below their respective AMCs throughout 2024.

2.2.2 Leachate Level Monitoring

Leachate head level monitoring results are presented in **Appendix B, Table B2**.

Fourth Quarter Summary

The monthly average level for all the wells remains below the required 3.0m, as per the Permit^[1]. It is lowest level recorded this year.

Annual Summary

The maximum leachate head per year has decreased by 0.92m from 2023 to 2024 as detailed in Table 1 below. Annual leachate head levels began decreasing in 2018. The driver for the higher average leachate head levels previously was LC5A as other wells have remained relatively stable over the years. LC5B (replacement of LC5A) was installed in the last quarter of 2023 and has remained consistent throughout 2024.

Table 1 - Annual leachate head results

Year	Maximum leachate Head	Average leachate Head	Average Leachate Head <3m
2014	3.95m	1.14m	Yes
2015	4.96m	1.84m	Yes
2016	4.83m	2.54m	Yes
2017	5.09m	2.70m	Yes
2018	5.36m	2.58m	Yes
2019	5.05m	2.74m	Yes
2020	4.89m	2.47m	Yes
2021	3.09m	1.94m	Yes
2022	3.09m	1.95m	Yes
2023	2.93m	2.04m	Yes
2024	2.01m	1.96m	Yes

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 there is no indication of the pipe's efficacy being reduced. Results are included **Appendix A, Figure A7 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 A3**.

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 upstream of the landfill and monitored on a six-monthly basis in accordance with the Permit requirements.

Fourth Quarter Summary

The upstream wells were monitored this quarter and show all locations are compliant with exception to SW2AI which exceeded the Unionised Ammoniacal Nitrogen EQS of 0.015mg/l with a concentration of 0.0317mg/l. This is an unusually high concentration and has not exceeded previously in this location. It is also noted that these elevated ammoniacal nitrogen concentrations were not recorded downstream.

Annual Summary

Results show all upstream surface water locations have been compliant with the freshwater EQS concentrations during 2024 with exception of unionised ammoniacal nitrogen at SW2AI in the fourth quarter. It is noted that this exceedance is recorded upstream, and the downstream wells do not display similar concentrations. If these concentrations persist into the next quarter and are not a reporting error, this may indicate an issue upstream from the landfill and will be investigated.

2.3.2 Downstream Surface Water

Fourth Quarter Summary

The results show SWD and SWD1 remain compliant for this quarter.

Annual Summary

Downstream surface water remains compliant throughout all of 2024.

2.4 Groundwater

2.4.1 Groundwater Quality Monitoring

Groundwater quality monitoring results are presented in **Appendix A, Figures A4 and A5** 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

The monitoring of upstream wells is undertaken to understand the groundwater quality upstream of the landfill. These wells provide insight to any potential contaminants that may originate from off-site sources, which may impact groundwater quality.

Fourth Quarter Summary

Both upstream wells are indicating negligible concentrations of contaminants this quarter, with exception to manganese in GW4.

The concentration of manganese within GW4 has elevated above the assessment level of 1.0mg/l to 2.12mg/l. Note being upstream, these groundwater wells are monitoring background concentrations.

Annual Summary

GW3 and GW4 have not identified any notable sources of contamination upstream which could impact the landfill in 2024. However, manganese continues to persist in GW4 with concentrations greater than the assessment level. Historically, manganese has continually been recorded above the assessment level in GW4 with continued fluctuations throughout the years showing no recognisable trend.

The elevated manganese 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.

2.4.1.2 Downstream Groundwater Wells

Fourth Quarter Summary

GW6 and GW7 have been installed in the centre of the valley in the sandstone strata classified as S1. Both wells continue to exceed the assessment level of 1.0mg/l for manganese.

GW9 is installed in the sandstone strata classified as S2-East. GW9 has increased above the assessment level for manganese with a concentration of 1.25mg/l. GW9 has also exceeded the trigger level of 1mg/l for ammoniacal nitrogen with a concentration of 3.7mg/l after remaining compliant the previous two quarters.

GW10 has been installed in the sandstone strata classified as S3-East. GW10 continues to exceed assessment level of 1mg/l for manganese with a concentration of 3.96mg/l, increasing from the previous quarter.

GW12 has been installed in the sandstone strata classified as S2-West and has exceeded assessment level for manganese for the second consecutive quarter with a concentration of 3.09mg/l. GW12 had not previously exceeded since 2019.

Annual Summary

Manganese

There has been an increase in groundwater wells displaying elevated manganese concentrations above the assessment level of 1.0mg/l.

GW6 started exceeding the assessment level in the third quarter of 2024 after remaining compliant since March 2014. GW7 has varied above and below the assessment level throughout 2023 and 2024 and has historically been known to fluctuate at magnitudes similar to upstream GW4.

GW10 continues to consistently exceed in manganese throughout 2024, this trend has also been seen in previous years (including 2023 and 2022). GW10 has also been known to display concentrations similar to the upstream GW4.

GW12 began exceeding manganese last quarter (Q3) after remaining below the assessment level since 2019, GW9 has also exceeded manganese for the first time since the third quarter of 2023.

The frequency of downstream wells showing elevated manganese concentrations above the assessment level has increased in the most recent quarter. The leachate results within the landfill remain consistent with the 2023 results, showing no change in manganese presence. The upstream well (GW4) is also recording manganese, from the steel works waste deposited to the north of the landfill and old mine workings in the area, it is assumed this is the source of the manganese in the downstream wells within the sandstone strata's (within GW6, GW7, GW9, GW10, GW12). In summary. The results indicate a potential off-site issue impacting the downstream groundwater, unrelated to the landfill.

Ammoniacal Nitrogen

GW9 has begun exceeding the trigger level of 1.0mg/l for ammoniacal nitrogen after remaining compliant for the second and third quarters of 2024.

Historically, GW9 has consistently exceeded the trigger level for ammoniacal nitrogen for several years. Numerous reports have demonstrated that there is no discernible environmental consequence to the non-compliance at GW9. Following communication with NRW in July, Blaenau-Gwent awaits a response regarding the review and approval of the IC1b report on groundwater and leachate pumping conclusions, which may result in disapplying the ammoniacal nitrogen limits for GW9.

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 A6**.

Fourth Quarter Summary

Water levels have remained relatively consistent this quarter with no significant differences from the 2023 readings.

Annual Summary

Overall, groundwater levels have remained consistent with 2023 readings^[4].

2.5 Landfill Gas

2.5.1 Landfill Gas Quality Monitoring

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

Fourth Quarter Summary

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

Most wells displayed carbon dioxide concentrations below the respective control and trigger levels, where available however, carbon dioxide levels have been recorded above the control and/or trigger levels in the following wells (valves):

- GMW6 (red valve) exceeds the trigger level in October only.
- GMW13 (yellow valve) continues to display elevated carbon dioxide concentration above the control level in October and December and the trigger level in November.
- GMW14/14A (red valve) exceeds the control level in November.

Annual Summary

- Throughout 2024 methane levels have remain compliant and below their respective control and trigger levels (where available) in all monitoring locations with the random exceptions of GMW13 and GMW14/14A in March, which is thought to have been due to reporting errors.

Carbon dioxide continues to record exceedances in control and trigger levels across numerous wells.

- GMW2 exceeded control and trigger levels in June, August and September in the red valve (maximum value 1.6%). These readings are generally lower than previous years, but they display similar trend of higher recordings during the summer months.
- GMW4 (red valve) exceeded the trigger level for in the first two consecutive quarters of 2024. A technical note was written and appended to the 2024 third quarter monitoring report ^[3] investigating the possible cause of these exceedances. The report concluded that the exceedances were down to reporting errors when sampled. Concentrations returned to below the appropriate control and trigger levels for the remainder of 2024.
- GMW6 continues to exceed control and trigger levels for the red valve from June, then August to November (maximum concentration 5.6%). These exceedances have occurred within similar months from 2018 - 2023.
- GMW7 (yellow valve) exceeded the control level in August and GMW12 the exceeded trigger level in March. Both wells have remained compliant since. As per Golders Associates ^[15] *“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”*.
- GMW13 has fluctuated within the yellow valve throughout 2024. The well exceeded control levels in April, September, October and December, while exceeding trigger levels in May and November. These exceedances are not historically recorded in this well. It is recommended that a further investigation into the ongoing exceedances is undertaken in the next quarter.
- GMW14/14A has become more compliant in 2024 in comparison to previous years. The well exceeded trigger levels in March for all valves and control level in the red valve in January and November. A gas chromatography note is currently being prepared and will be shared along with next quarters findings.
- Levels of carbon dioxide continue to be recorded in GMW1, GMW8, GMW9, GMW10, GMW17 and GMW18. However, no control or trigger levels have been derived for these monitoring locations as they are not required by the Permit ^[2].

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.

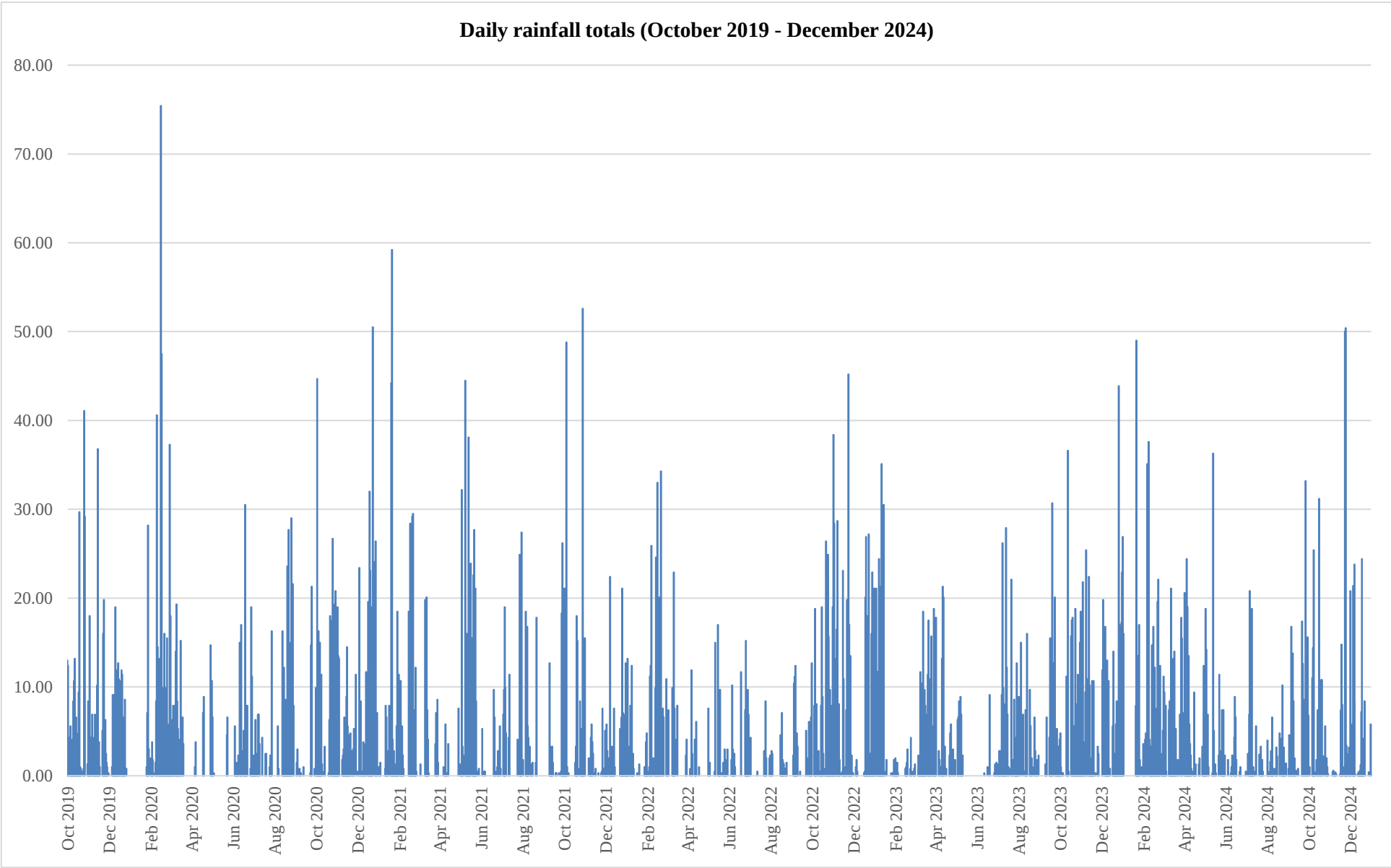
The annual and fourth quarter report has noted the following:

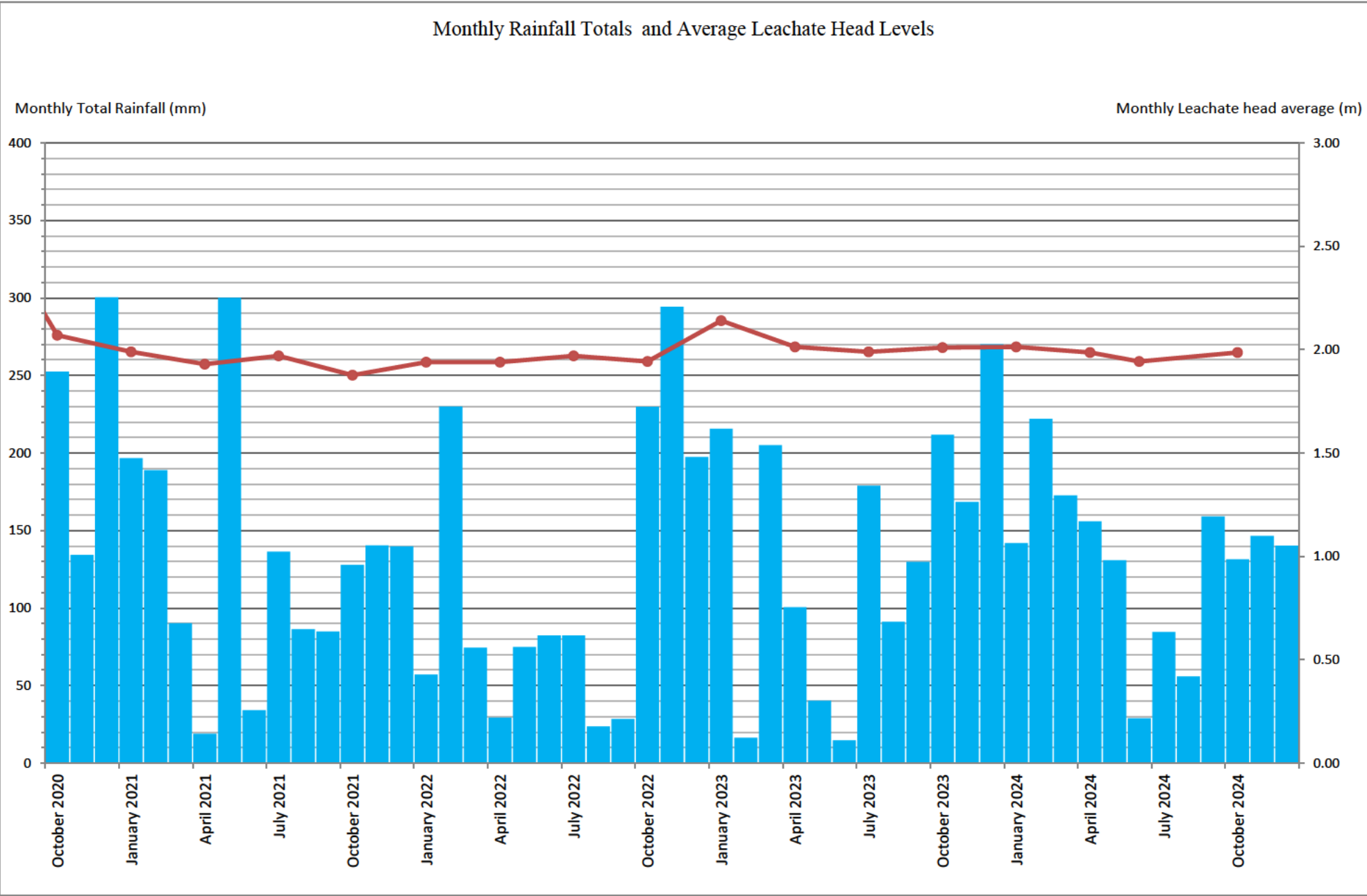
- SW2AI has exceeded the EQS for unionised ammoniacal nitrogen in the fourth quarter of 2024. It is noted that this exceedance is recorded upstream, and the downstream wells do not display similar concentrations. If these concentrations persist into the next quarter and are not a reporting error, this may indicate an issue upstream from the landfill and will be investigated.
- All downstream groundwater wells are displaying elevated manganese concentrations above the assessment level of 1.0mg/l. In 2024, previously compliant wells (GW9 and GW12) have started displaying these elevated concentrations. The leachate results within the landfill remain consistent with the 2023 results, showing no change in manganese concentrations. Typically, an upstream groundwater well (GW4) records elevated manganese concentrations from the steel works waste deposited to the north of the landfill and old mine workings in the area, it is assumed this is the source of the manganese in the downstream wells within the sandstone strata's. In summary, the results indicate a potential off-site issue impacting the downstream groundwater, unrelated to the landfill.
- GW9 continues to exceed the ammoniacal nitrogen trigger level. Following communication with NRW in July, Silent Valley Waste Services awaits a response regarding the review and approval of the IC1b report on groundwater and leachate pumping conclusions, which may result in disapplying the ammoniacal nitrogen limits for GW9. Numerous studies have been conducted previously concluding that ammoniacal nitrogen exceedances in GW9 do not have a discernible impact on environment.
- GMW13 has fluctuated within the yellow valve throughout 2024. The well exceeded control levels in April, September, October and December, while exceeding trigger levels in May and November. These exceedances are not historically recorded in this well. An investigation will be undertaken in the next quarter.
- GMW14/14A has become more compliant in 2024 in comparison to previous years. The well exceeded trigger levels in March for all valves and control level in the red valve in January and November. A gas chromatography note is currently being prepared in 2025 and will be shared along with next quarter's findings.

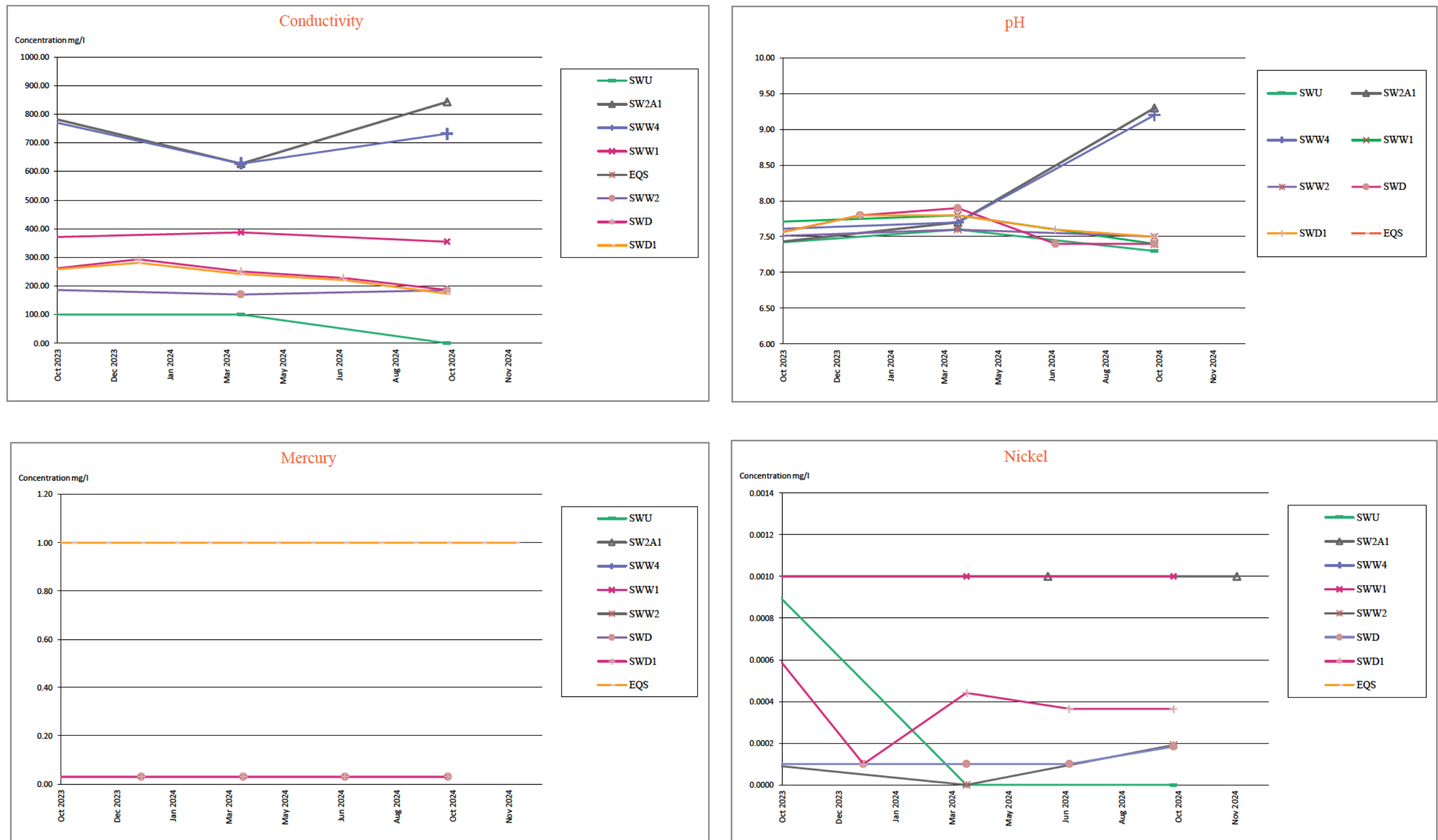
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- [1] Environment Agency, Silent Valley Landfill Site, Pollution Prevention and Control (England and Wales) Regulations 2000, Landfill (England and Wales) Regulations 2002, Permit number MP3835SV, November 2005, Permit amended as of 04/03/16.
- [2] Arup, Silent Valley Landfill, 2019 Annual Monitoring Report, 31st January 2020.
- [3] Arup, Silent Valley Landfill, 2024 Third Quarter Monitoring Report, 20th December 2024.
- [4] Arup, Silent Valley Landfill, 2023 Annual Monitoring Report, 31st January 2024.
- [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.
- [15] Golder Associates (2006), Establishment of Trigger Levels at Silent Valley landfill site, letter report dated 21 December 2006

Appendix A: Monitoring Results - Graphs







Surface water monitoring graphs

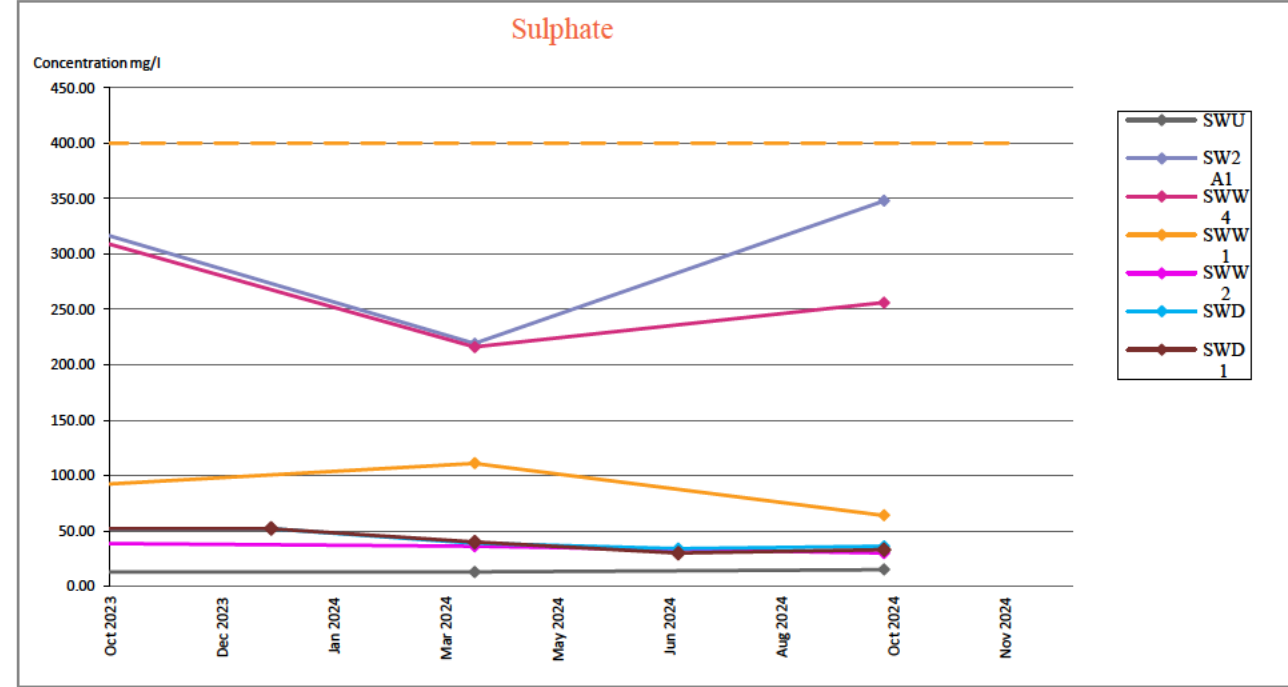
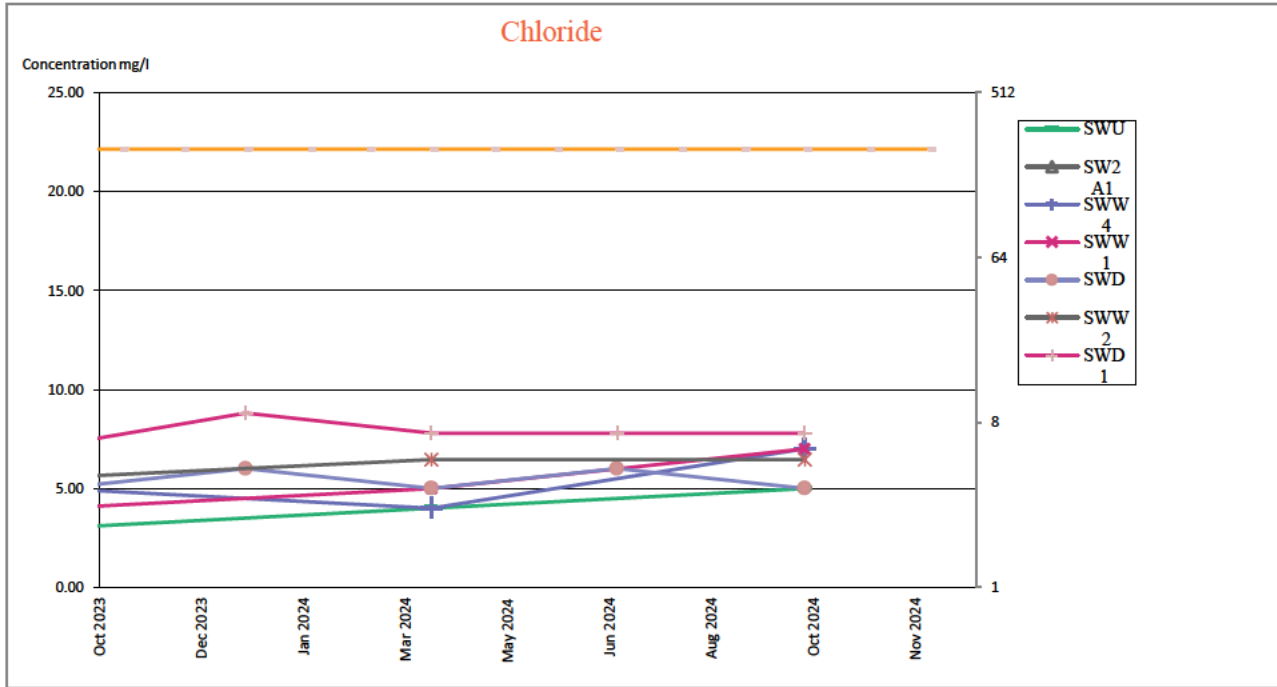
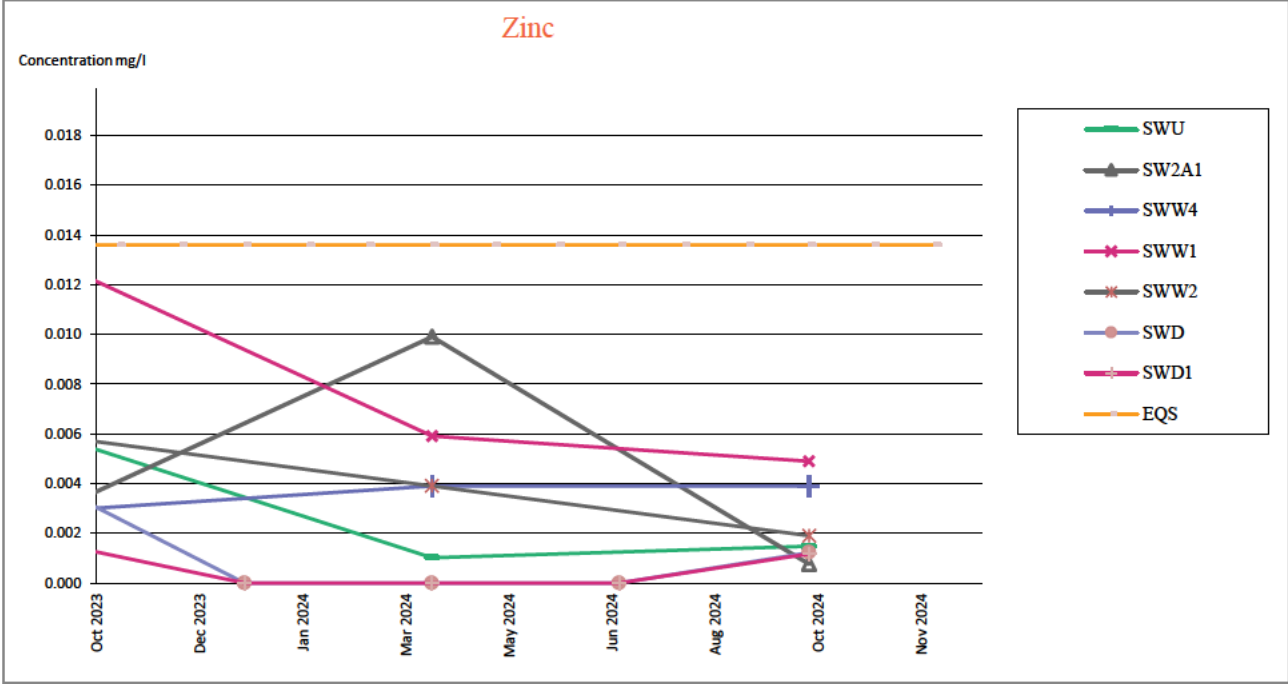
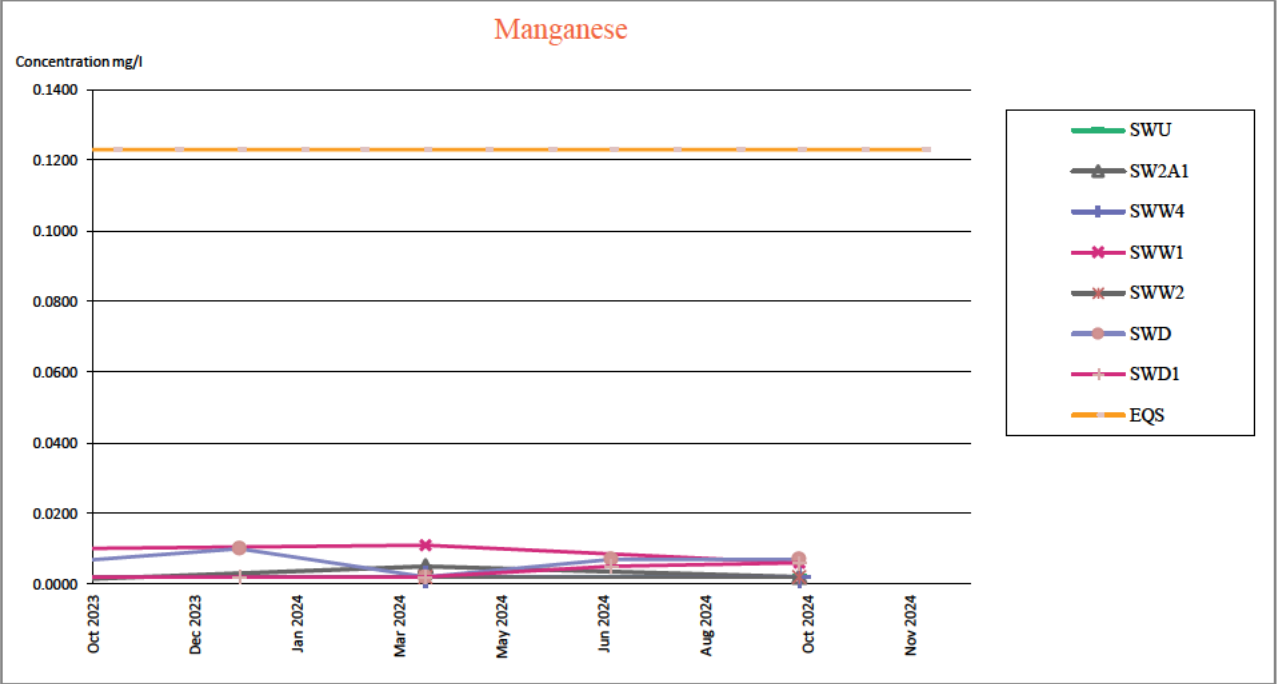
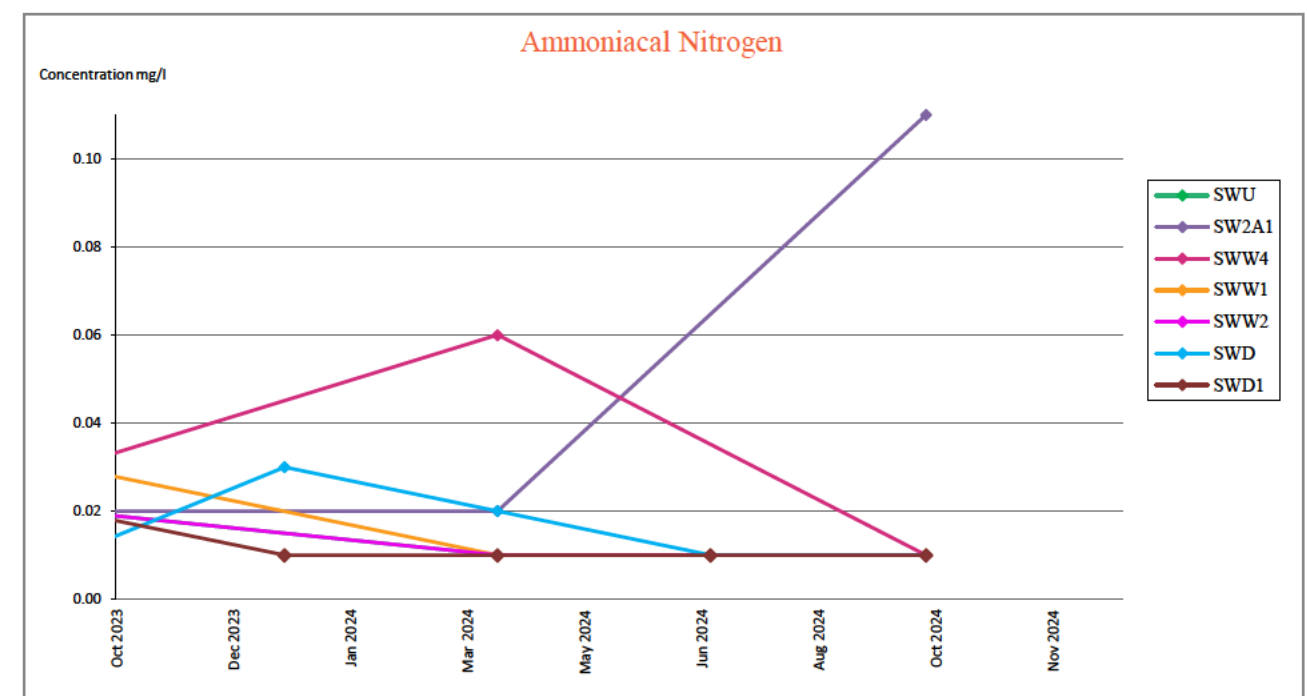
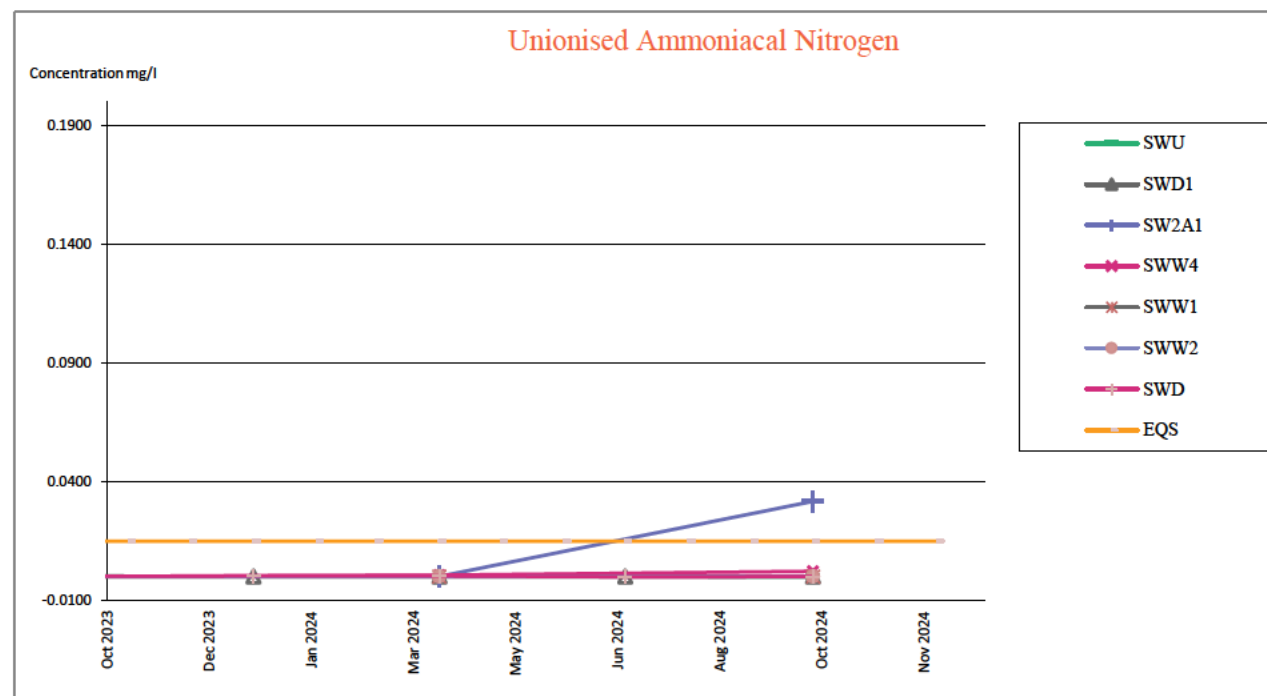


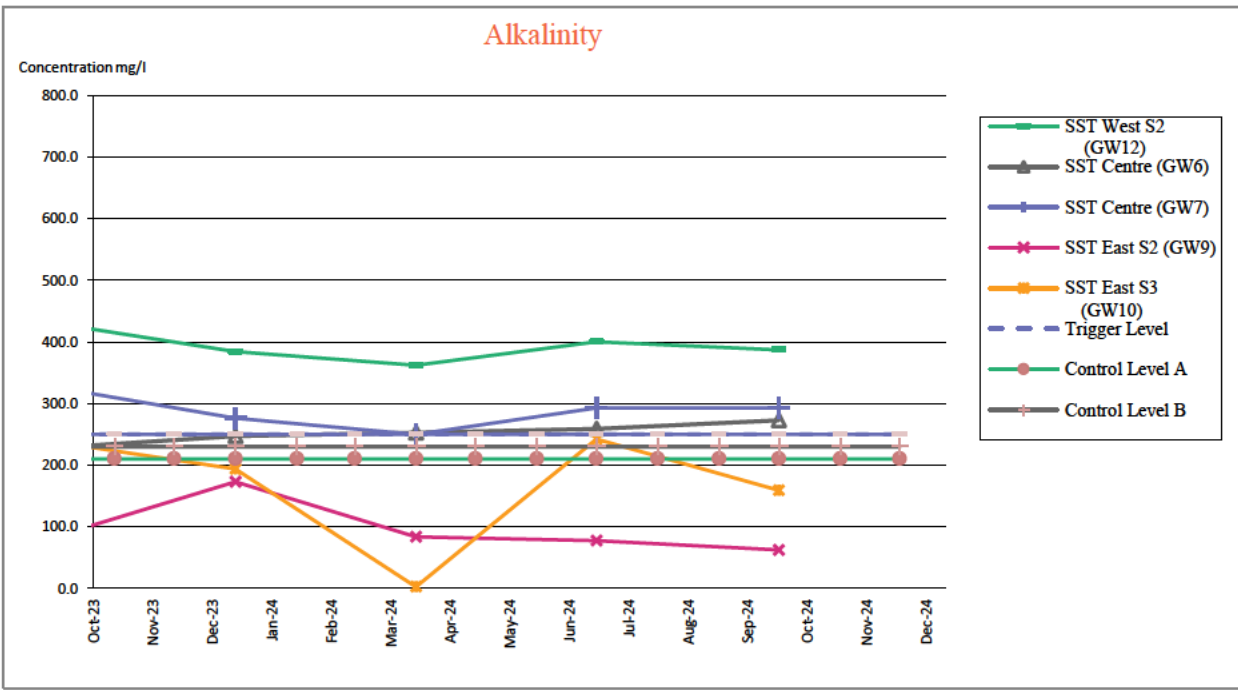
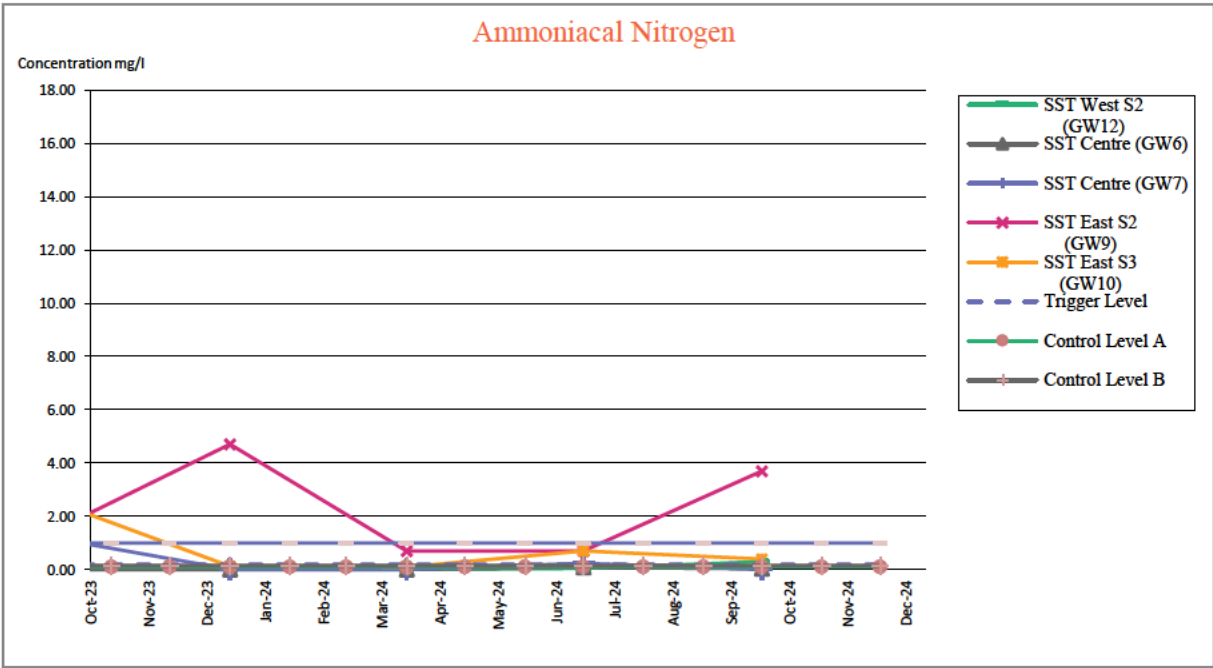
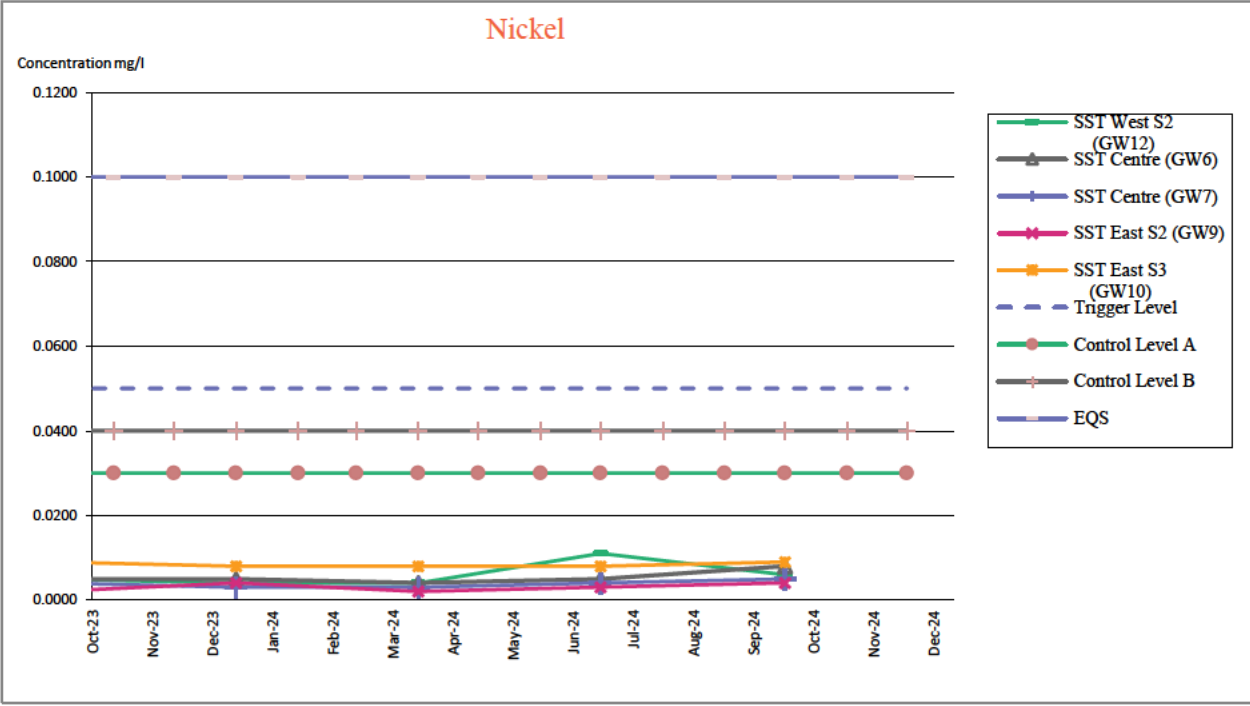
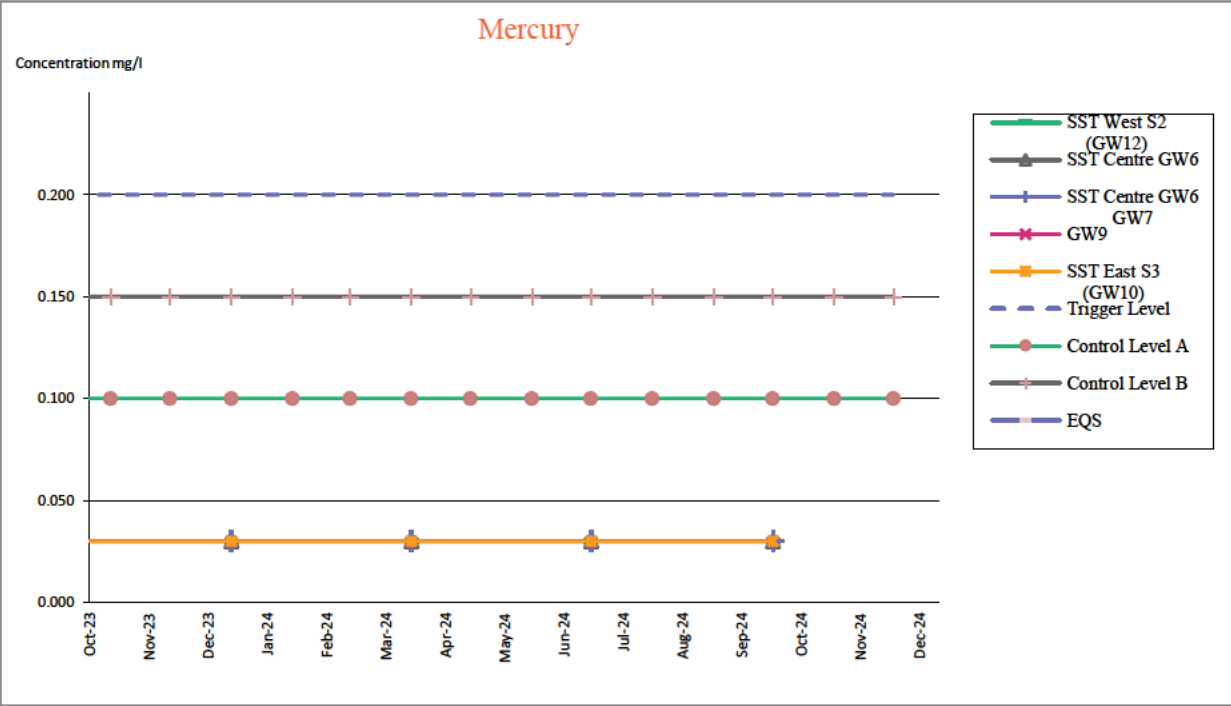
Figure A3

Surface water monitoring graphs



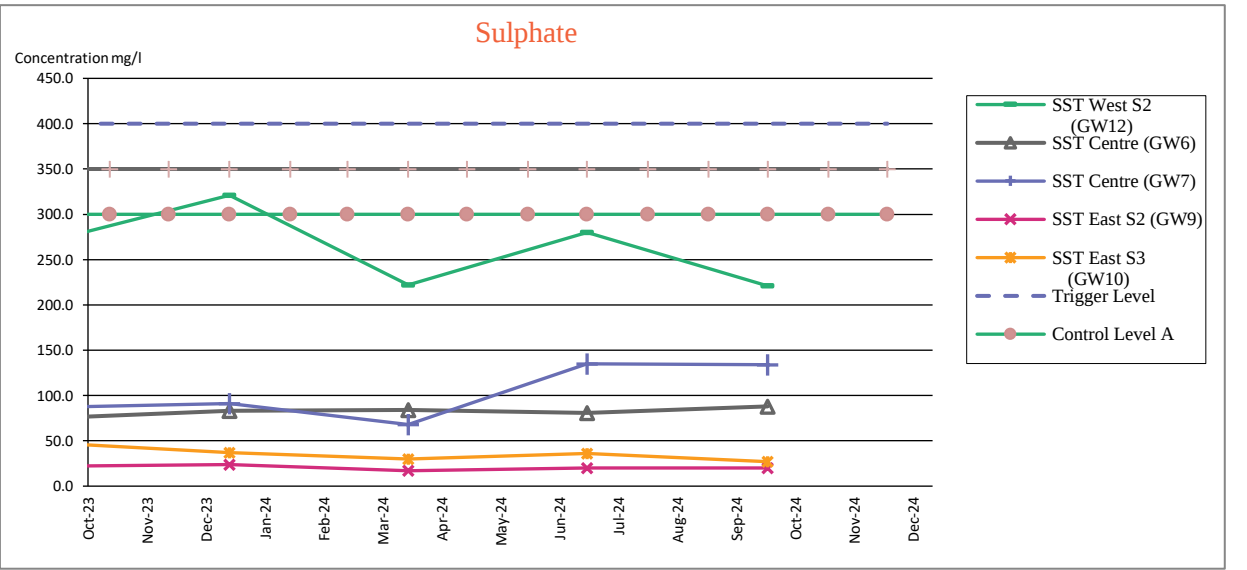
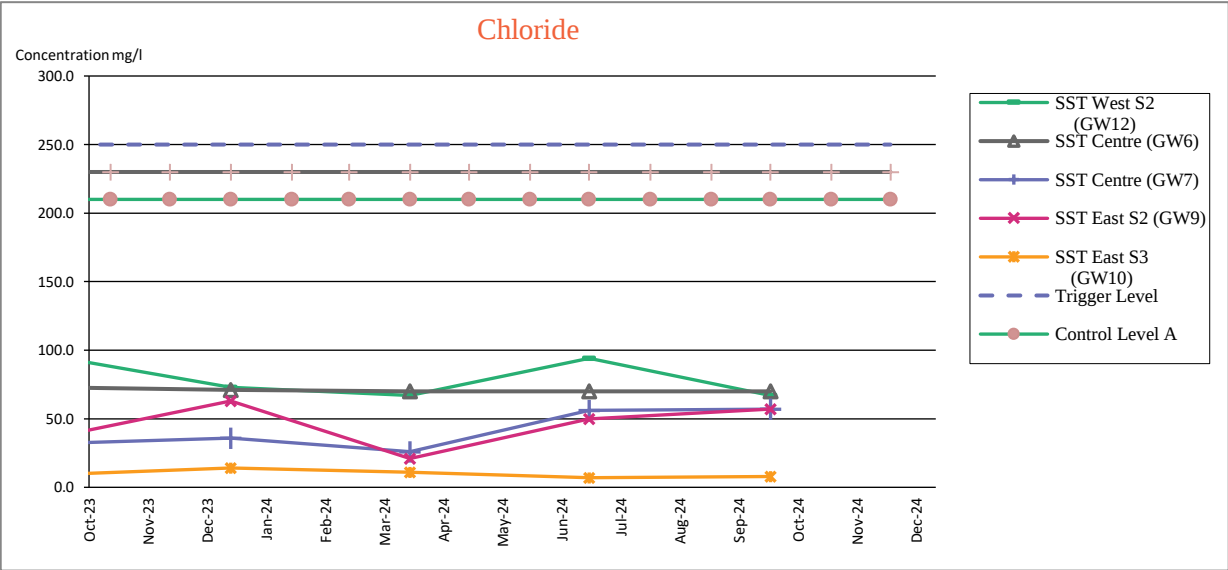
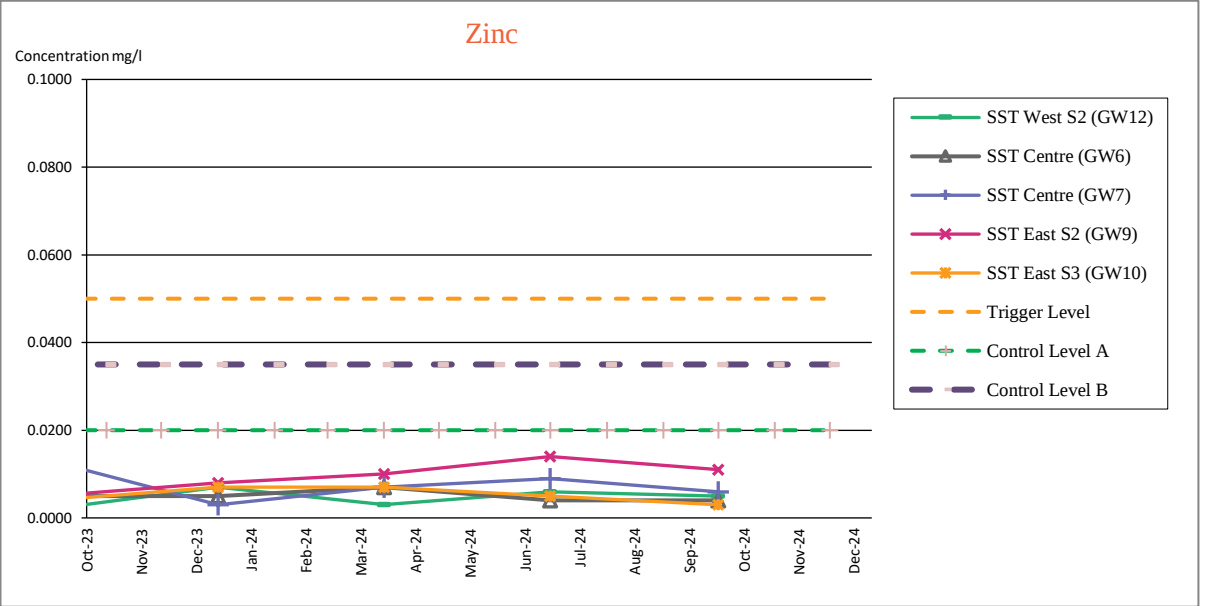
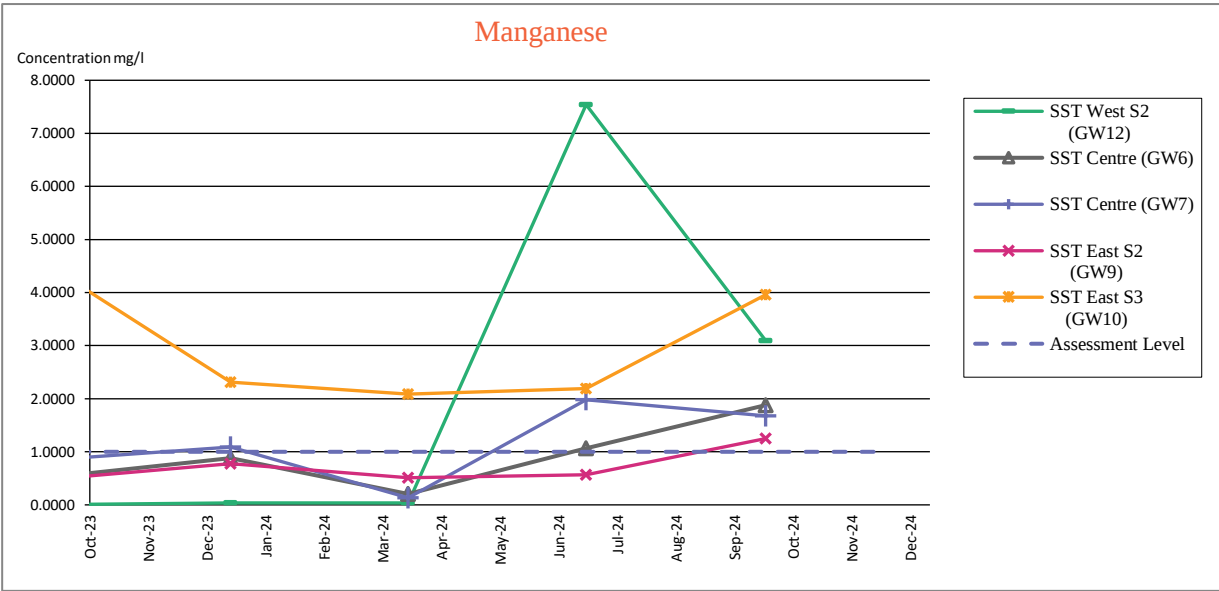
Groundwater quality monitoring results - Compliance wells graphs

Compliance wells graphs



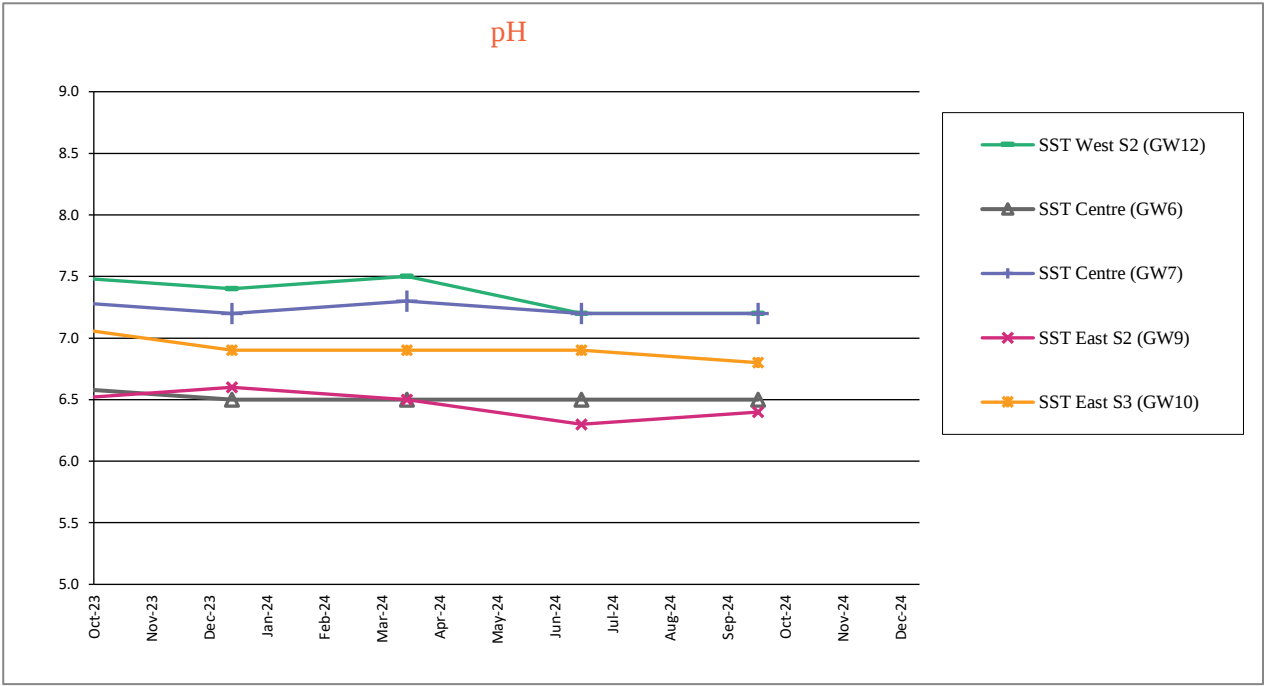
Groundwater quality monitoring results - Compliance wells graphs

Compliance wells graphs

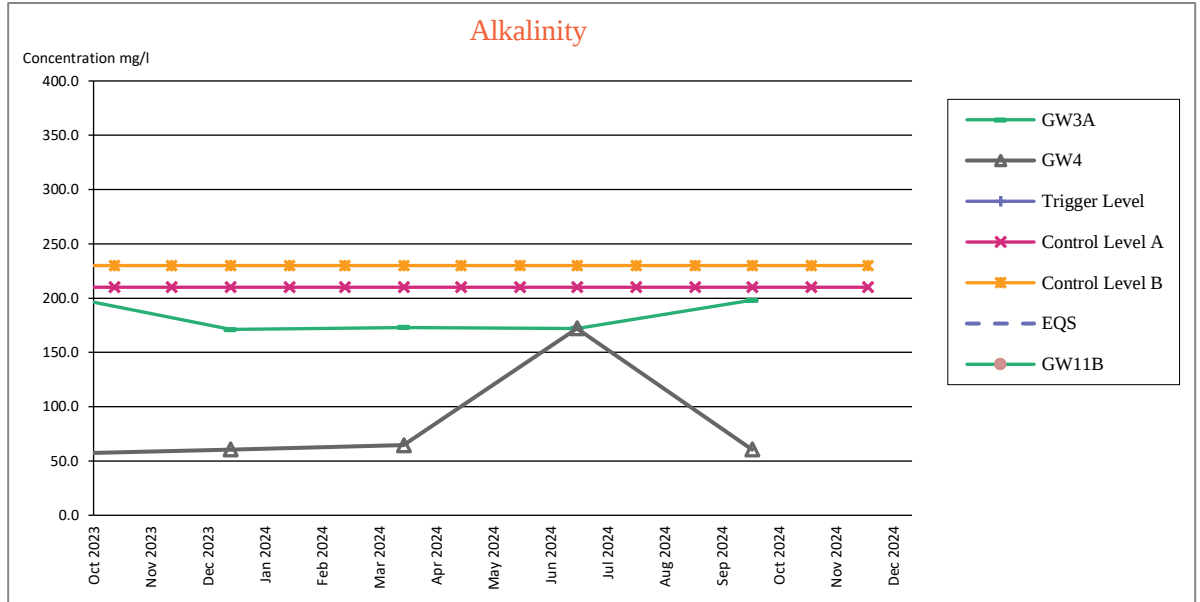
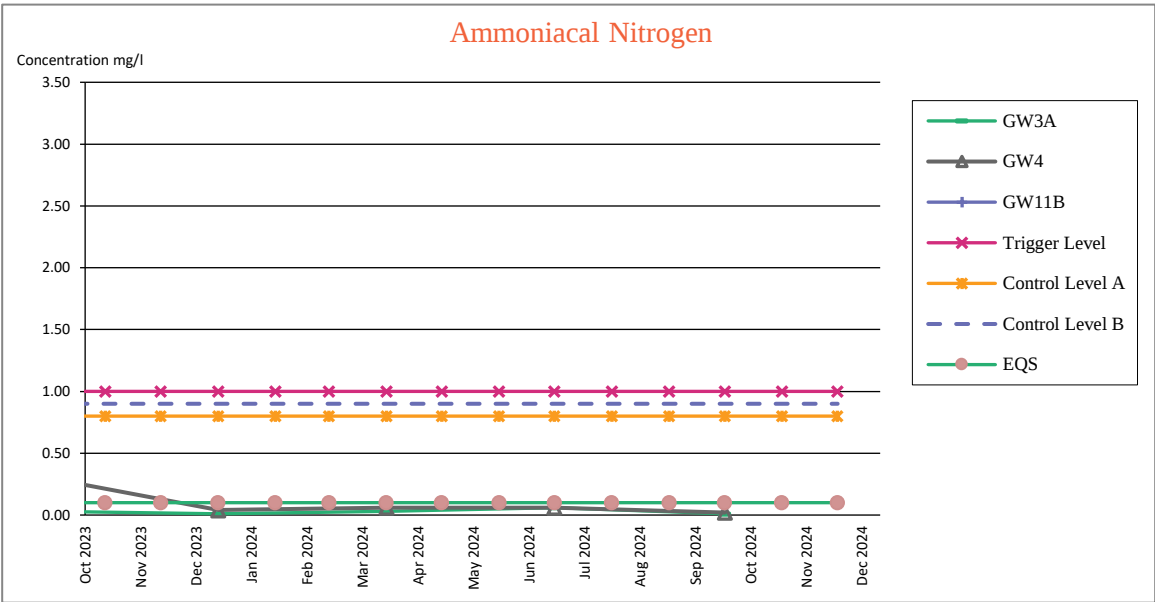
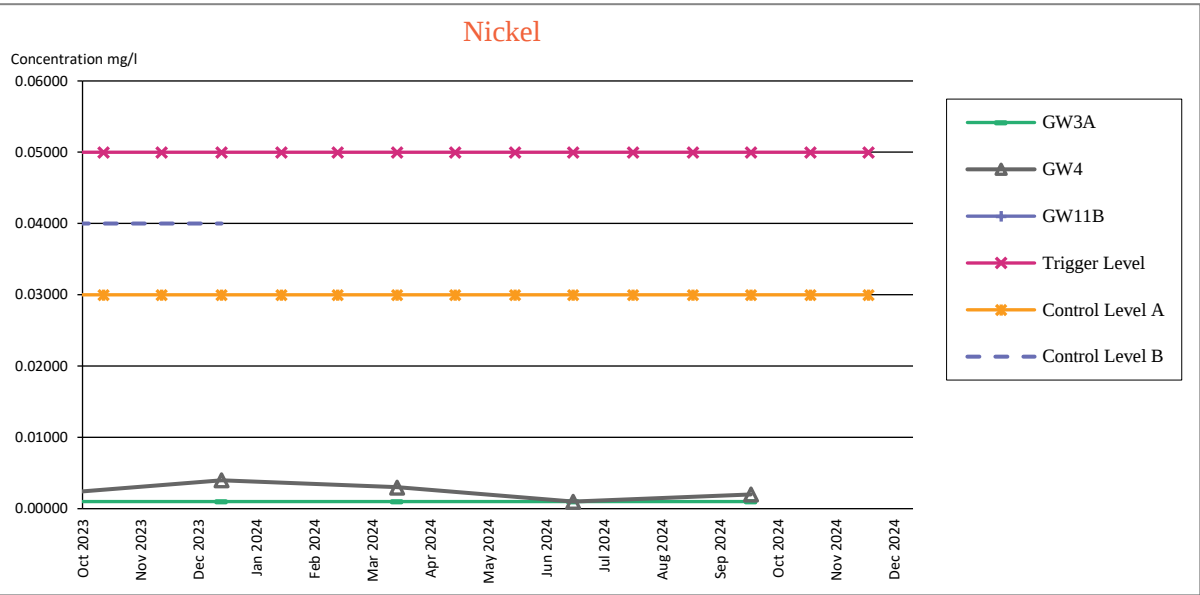
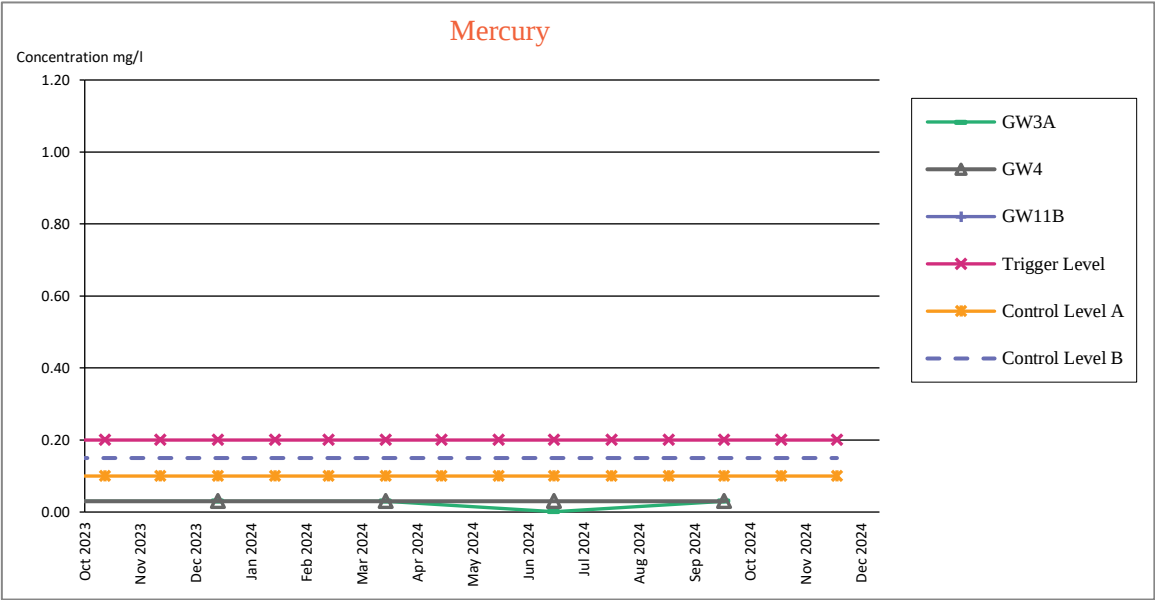


Groundwater quality monitoring results - Compliance wells graphs

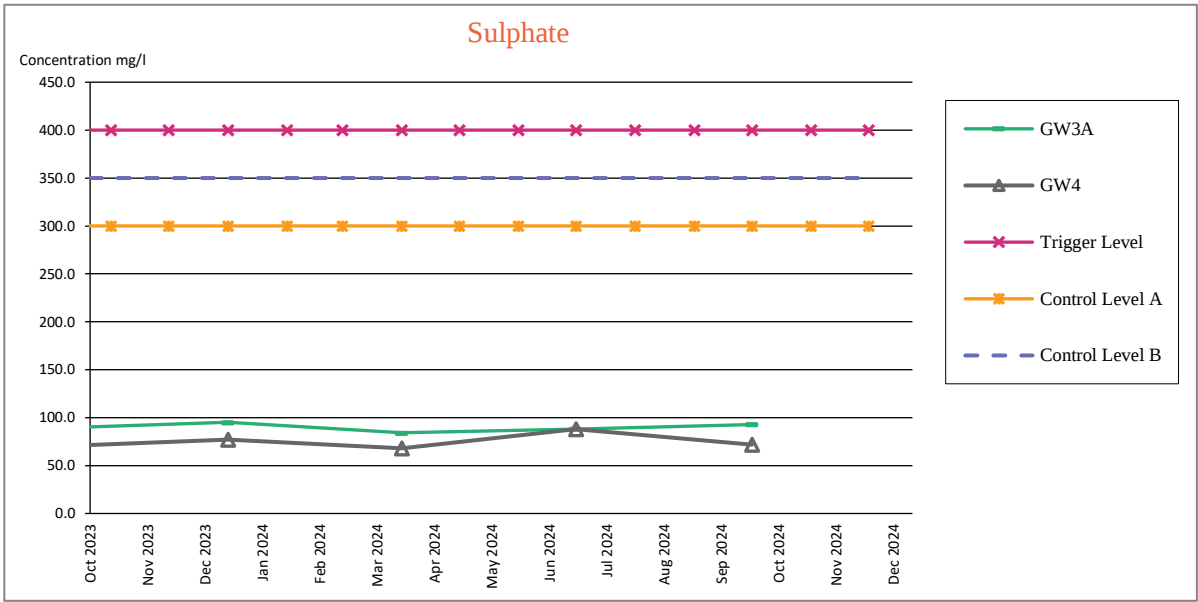
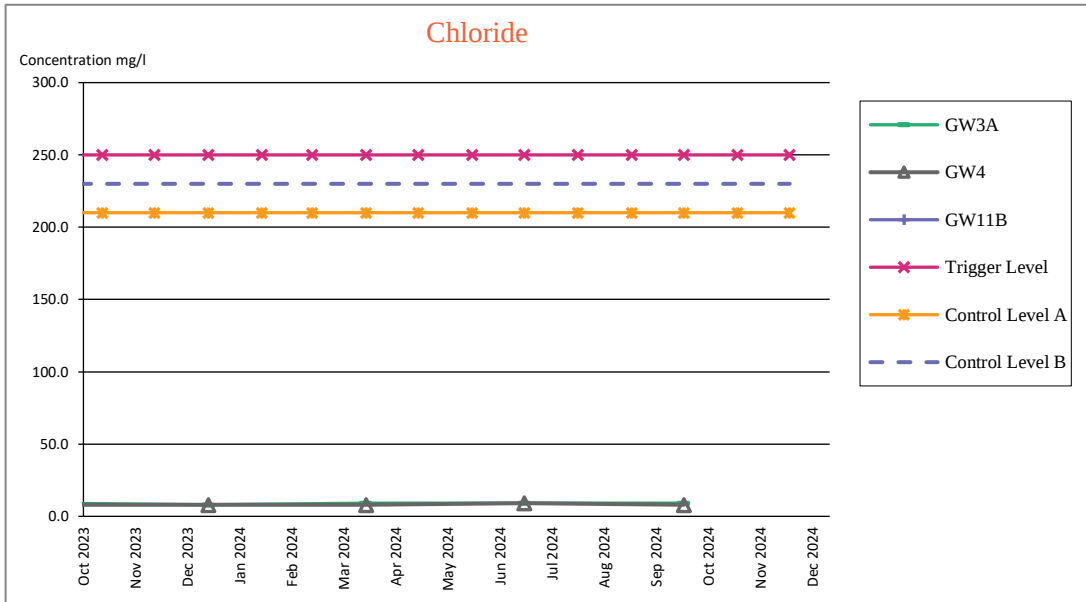
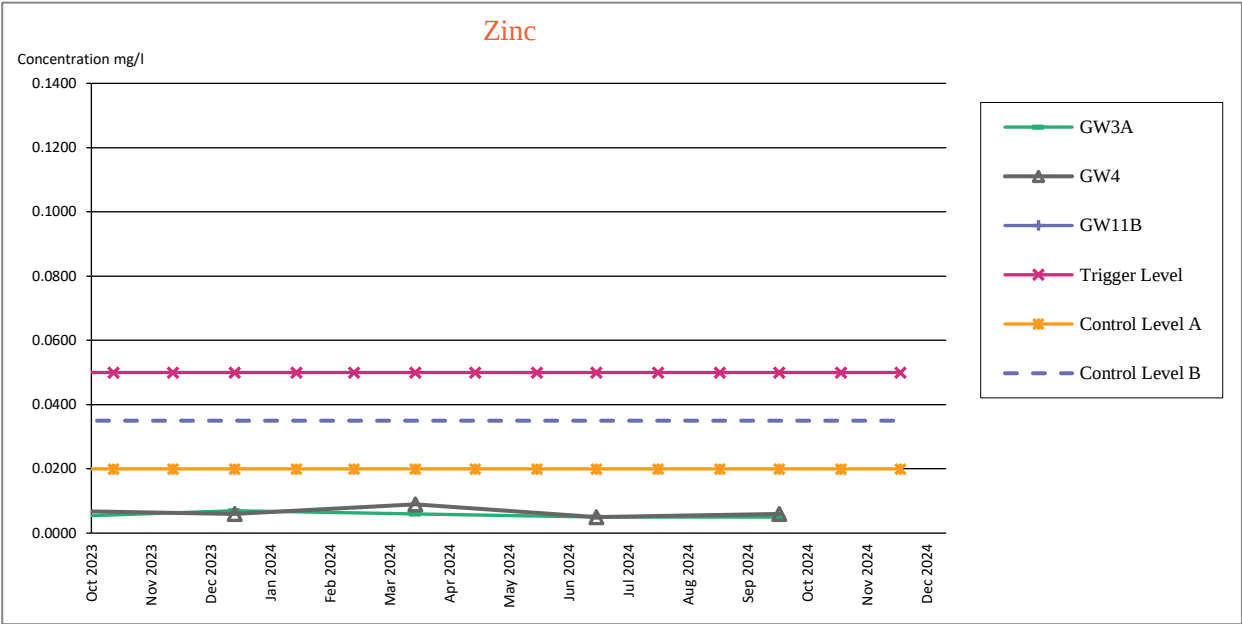
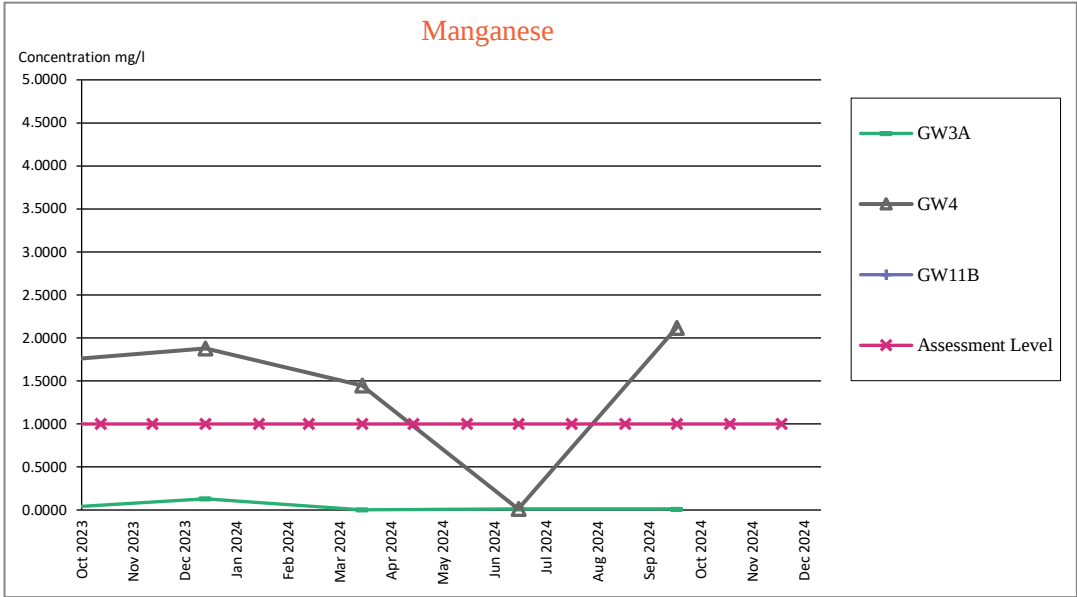
Compliance wells graphs



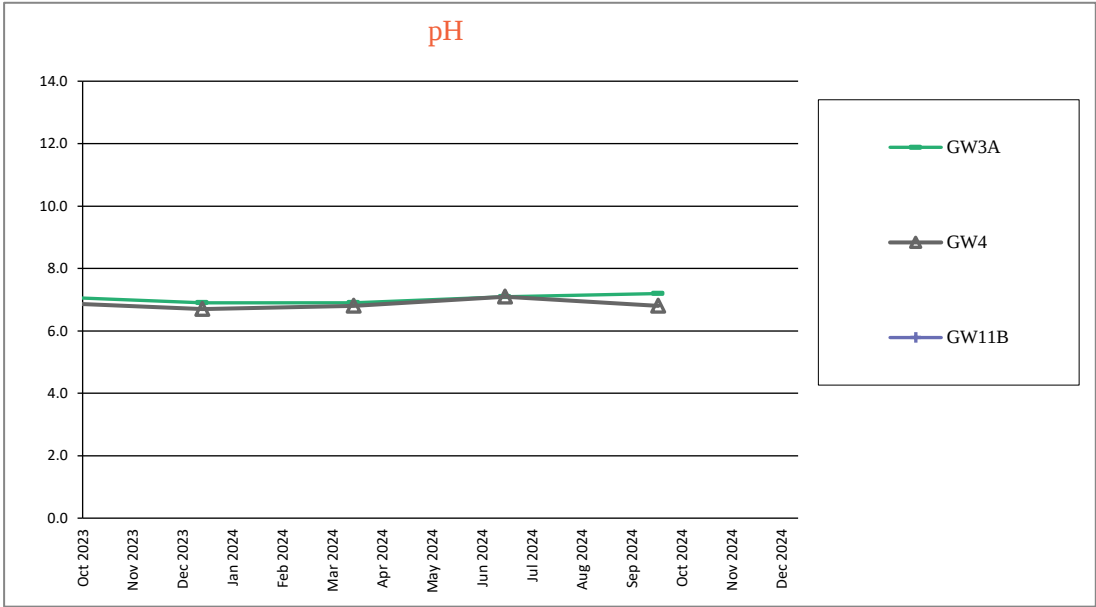
Groundwater quality monitoring results - Upstream wells graphs

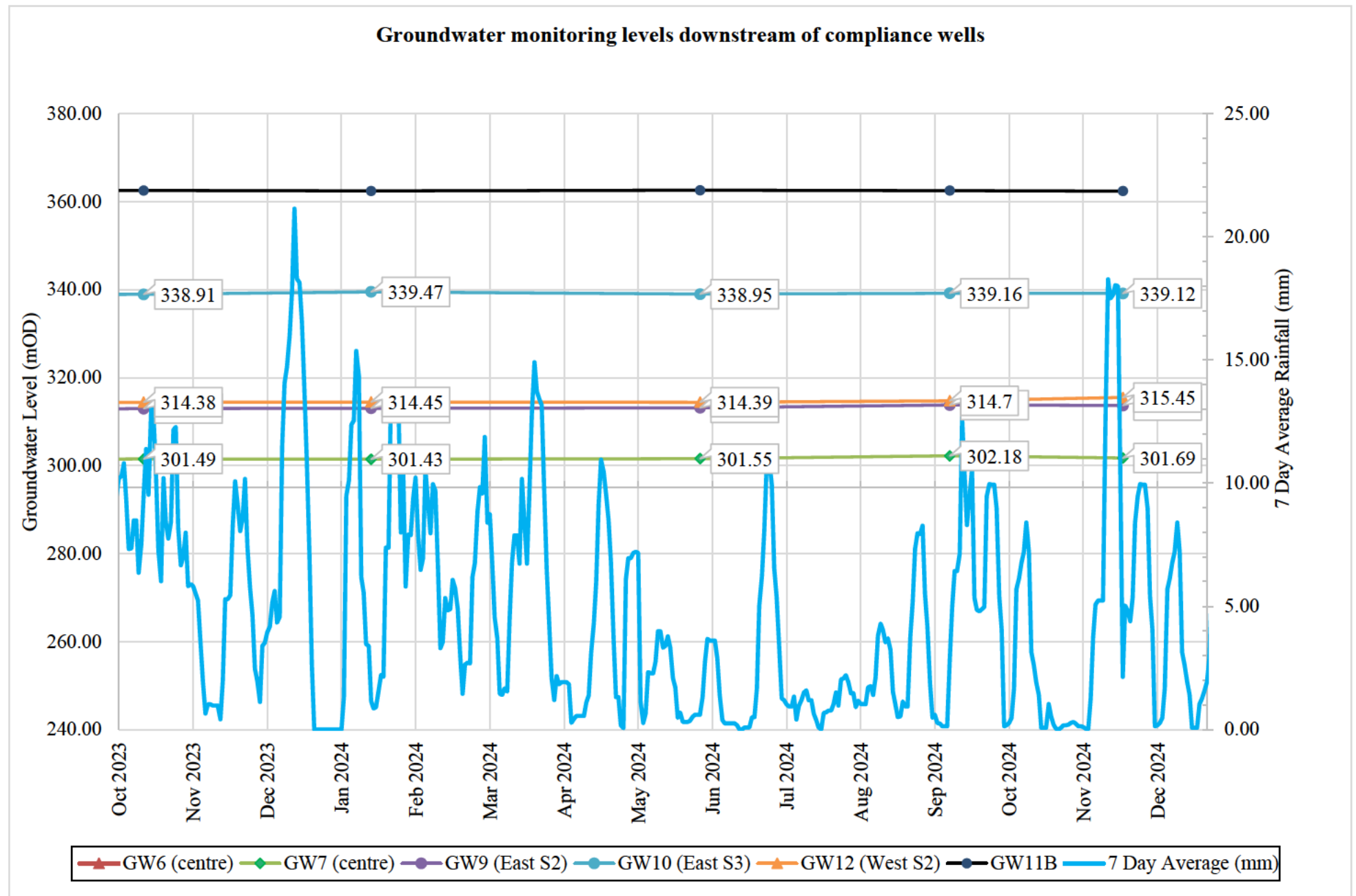


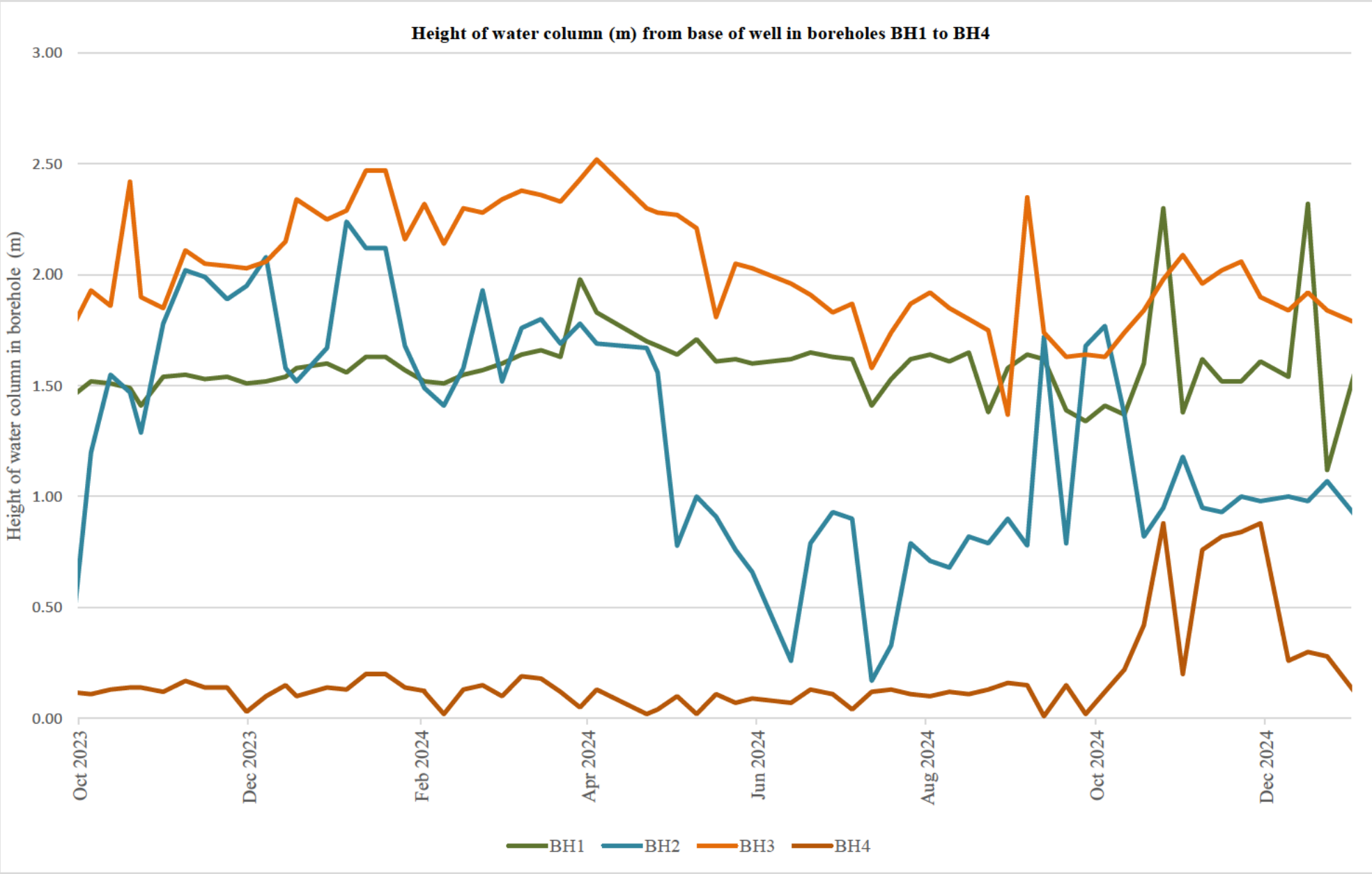
Groundwater quality monitoring results - Upstream wells graphs



Groundwater quality monitoring results - Upstream wells graphs







Appendix B: Monitoring Results - Tables

Leachate Monitoring Results

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	-							-	-	-		
pH	pH Units	N/S	7.5	N/S	8.3	7.3	8.1	8.3	7.80	--	8.3	7.9
Conductivity- Electrical 20C	uS/cm		2320		11000	4110	10000	11000	6858	--	1350	1600
Redox Potential ^(see note 4)	mV		246		136	-45	-35	246	76	--	236	231
Dissolved Oxygen, Fixed*	mg/l		11.7		8.3	4.2	3.4	11.7	6.90	--	11.9	12
Alkalinity as CaCO3	mg/l		541		5200	2160	4640	5200	3135	--	356	476
Total Suspended Solids	mg/l		18		2660	2100	2000	2660	1695	--	<5	8
Solids, Total Dissolved 180 deg C	mg/l		1670		4970	1780	4150	4970	3143	--	941	1140
TOC (filtered)	mg/l		17.7		279	44.6	324	324	166	--	7.82	6.9
Ammoniacal Nitrogen as N	mg/l		< 0.01		407	227	387	407	255	526	0.3	0.7
Chloride as Cl	mg/l		185		613	161	481	613	360	1408	83	80
Manganese in filtrate as Mn	mg/l		0.152		0.089	0.888	0.301	0.888	0.36	--	0.004	0.02
Mercury, filt trace as Hg	mg/l		< 0.00030		< 0.0003	< 0.00003	< 0.0003	0.00030	0.0002	0.00056	< 0.00003	< 0.00003
Nickel in filtrate as Ni	mg/l		0.014		0.091	0.006	0.078	0.091	0.05	0.0681	0.004	0.003
Sulphate as SO4	mg/l		325		334	9	47	334	179	999	199	236
Zinc, ultra-low filtered as Zn	mg/l		0.038		0.029	0.008	0.032	0.038	0.03	1.38	0.007	0.018

- Notes
- 1. < denotes 'less than'.
 - 2. L1A,L1B, LC1A, LC2A,LC4A, LC5B: Wells in Waste.
 - 3. -- denotes 'no acceptable maximum concentration available'.
 - 4. The redox potential was not measured on site and there is a possibility that it has changed between sampling and analysis
 - 5. LC5B is a replacement for LC5A well.
 - 6. N/S denotes 'not sampled'.

Exceedance of AMC (per well)

Exceedance of AMC (monthly average)

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			357.62			357.62			357.62		
	Elevation at top of casing mAOD	398.85			398.85			398.85			398.85		
	Depth to leachate from top of casing (m)	40.38			40.30			40.26			40.39		
	Leachate elevation (mAOD)	358.47			358.55			358.59			358.46		
	Calculated leachate head (m)	0.85			0.93			0.97			0.84		
LC2A	Elevation of base of landfill mAOD	362.49			362.49			362.49			362.49		
	Elevation at top of casing mAOD	401.12			401.12			401.12			401.12		
	Depth to leachate from top of casing (m)	35.54			35.65			35.85			35.85		
	Leachate elevation (mAOD)	365.58			365.47			365.27			365.27		
	Calculated leachate head (m)	3.09			2.98			2.78			2.78		
LC4A	Elevation of base of landfill mAOD	372.27			372.27			372.27			372.27		
	Elevation at top of casing mAOD	401.14			401.14			401.14			401.14		
	Depth to leachate from top of casing (m)	26.77			26.82			26.79			26.78		
	Leachate elevation (mAOD)	374.37			374.32			374.35			374.36		
	Calculated leachate head (m)	2.10			2.05			2.08			2.09		
LC5B	Elevation of base of landfill mAOD	349.79			349.79			349.79			349.79		
	Elevation at top of casing mAOD	380.75			380.75			380.75			380.75		
	Depth to leachate from top of casing (m)	29.87			29.12			29.13			29.95		
	Leachate elevation (mAOD)	350.88			350.88			350.88			350.88		
	Calculated leachate head (m)	1.09			1.09			1.09			1.09		
L1	Casing height (mAOD)	357.00			357.00			357.00			357.00		
	Leachate (mbgl)	DRY			DRY			NS			DRY		
	Leachate (m AOD)	-			-			-			-		
	Base of landfill (m AOD)	336.80			336.80			336.80			336.80		
	Depth of well from top of casing (m)	20.02			21.02			NS			21.02		
	Base of well (m AOD)	336.98			335.98			-			335.98		
	Calculated leachate head (m)												
L1A*	Casing height (mAOD)	355.79			355.79			355.79			355.79		
	Leachate (mbgl)	DRY			40.30			DRY			DRY		
	Leachate (m AOD)	-			315.49								
	Base of landfill (m AOD)	316.64			316.64			316.64			316.64		
	Depth of well from top of casing (m)	20.95			20.92			20.94			20.92		
	Base of well (m AOD)	334.84			334.87			334.85			334.87		
	Calculated leachate head (m)				1.15								
L1B*	Casing height (mAOD)	354.80			354.80			354.80			354.80		
	Leachate (mbgl)	25.77			25.50			25.99			24.49		
	Leachate (m AOD)	329.03			329.30			328.81			330.31		
	Base of landfill (m AOD)	319.60			319.60			319.60			319.60		
	Depth of well from top of casing (m)	34.80			34.80			34.81			34.40		
	Base of well (m AOD)	320.00			320.00			319.99			320.40		
	Calculated leachate head (m)	9.43			9.70			9.21			10.71		

2024	Quarterly Leachate Head Averages (m)
January	2.01
February	
March	
April	1.99
May	
June	
July	1.94
August	
September	
October	1.90
November	
December	

Minimum monthly leachate head average

Maximum monthly leachate head average

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

* Well not included in monthly average.

** NS - Not Sampled

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

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								
J a n u a r y	Upstream of Landfill	SWU	Six-monthly	Not sampled this quarter																									
		SW2AI																											
	SWW4																												
	NW Ditch System	SWW1	Six-monthly	Not sampled this quarter																									
SWW2																													
Downstream of Landfill	SWD	Quarterly	<	0.03	<	0.0100	<	0.0010	<	0.0001	0.008	<	0.0001	7.8	293		0.0003	8.7	6.00	52.0	<5	11	1.3	315.20	84	43			
	SWD1		<	0.03	<	0.0020		0.0020	<	0.0001	0.010	<	0.0001	7.8	281	<	0.01	0.0001	7.8	9.00	52.0	<5	12	1.6	12.10	72	36		
A p r i l	Upstream of Landfill	SWU	Six-monthly	<	0.03	<	0.002		0.002	<	0.0001	0.008	<	0.0001	7.6	100	0.01	0.00007	10.00	4.00	13.0	<5	11	0.5	357.20	12	4		
		SW2AI		<	0.04		0.005	<	0.001	<	0.0001	0.009	<	0.0001	7.7	627	0.02	0.00022	12.2	3.0	219.0		10	5.0	328.60	92	93		
		SWW4		<	0.07	<	0.002	<	0.001	<	0.0001	<	0.004	<	0.0001	7.7	627	0.06	0.00067	12.5	4.00	216.0	<5	11	6.0	328.90	94	86	
	NW Ditch System	SWW1	Six-monthly	<	0.03	<	0.011	<	0.001	<	0.0001	0.006	<	0.0001	7.8	387.0	<	0.01	0.00012	10.7	5.00	111.0	<5	10	1.0	330.80	73	44	
		SWW2		<	0.06	<	0.002	<	0.001	<	0.0001	0.004	<	0.0001	7.6	170.0	<	0.01	0.00007	9.5	5.00	36.0	<5	11	0.4	398.60	36	17	
	Downstream of Landfill	SWD	Quarterly	<	0.03	<	0.0020	<	0.0010	<	0.0001	0.005	<	0.0001	7.9	251		0.00035	12.4	5.00	39.0	<5	10	1.3	346.70	81	36		
		SWD1		<	0.03	<	0.0020		0.0030	<	0.0001	0.009	<	0.0001	7.8	242	<	0.01	0.00014	12.3	7.00	40.0	<5	10	1.9	313.70	64	29	
J u l y	Upstream of Landfill	SWU	Six-monthly	Not sampled this quarter																									
		SW2AI																											
	SWW4																												
	NW Ditch System	SWW1	Six-monthly	Not sampled this quarter																									
SWW2																													
Downstream of Landfill	SWD	Quarterly	<	0.03		0.007		0.001	<	0.0001	0.009	<	0.0001	7.4	228	<	0.01	0.00005	10.9	6	34	17	11.9	1.9	221.00	83	33		
	SWD1		<	0.03		0.005		0.002	<	0.0001	0.011	<	0.0001	7.6	220		0.01	0.00008	11.4	7	30	6	11.6	2.6	233.00	73	29		
O c t o b e r	Upstream of Landfill	SWU	Six-monthly	<	0.03	<	0.002		0.002		0.0003	0.008		0.0016	7.3	<100	<	0.01		0.00003	8.9	5	15	28	12.7	0.56	240	13.1	6
		SW2AI		<	0.03	<	0.002	<	0.001	<	0.0010	0.004		0.0009	9.3	843	0.11	0.0317	11.2	6	348	11	10.9	8.42	155	75.8	119		
		SWW4		<	0.03	<	0.002	<	0.001	<	0.0010	0.004		0.0009	9.2	732	0.01	0.0023	10.4	7	256	<5	10.9	6.64	153	85.8	92		
	NW Ditch System	SWW1	Six-monthly	<	0.03		0.006	<	0.001	<	0.0002	0.005		0.0012	7.4	354	<	0.01	0.0001	11	7	64.0	<5	11.3	1.01	231.00	90	38	
		SWW2		<	0.03	<	0.002	<	0.001	<	0.0002	0.002		0.0004	7.5	185	<	0.01	0.0001	9.7	5	30	<5	11.8	0.58	104	49.2	22	
	Downstream of Landfill	SWD	Quarterly	<	0.03		0.007		0.001		0.0002	0.006		0.0013	7.4	186	<	0.01	0.00004	9.4	5	36	7	11.9	1.23	227	50.8	21	
		SWD1		<	0.03		0.006		0.002		0.0004	0.006		0.0013	7.5	173	<	0.01	0.0001	8.9	7	33	7	12	1.4	214	39	18	
Minimum				<	0.0020	<	0.0010	<	0.0001	<	0.0020	<	0.0001	7.3	100	<	<	0.0000	7.8	3.0	13.0	6.0	9.8	0.4	12.1	12.1000	4.0000		
Maximum				<	0.0110	<	0.0030	<	0.0010	<	0.0110	<	0.0016	9.3	843	<	<	0.0317	12.5	9	348	28	12.7	8	399	94	119		
Count					18		18		18		18		18		17			18	18	18	18	6	18	18	18	18	18	18	

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)

	Exceedance of EQS
	Upstream of Nant Merddog
	Downstream of Nant Merddog

Groundwater monitoring results

UPSTREAM WELLS

Table B4

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 ^{uu})	--	0.03	(0.02 ^{uu})	--	--	--	0.8	--	--	210	300	--	--	--			
	Control Level B				(0.15 ^{uu})	--	0.04	(0.035 ^{uu})	--	--	--	0.9	--	--	230	350	--	--	--			
	Assessment Level				--	(1.0 ^u)	--	--	--	--	--	--	--	--	--	--	--	--	--			
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																				
	GW9	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	12/06/24	24052866-011	340.1	<	0.030	0.515	0.002	0.01	6.5	405	83.6	0.7	0.00048	12.2	21	17	27	2.9	7.02	
		May-24	Quarterly																			
		Jun-24																				
		Jul-24	17/10/24	24102838-011	228	<	0.03	0.5670	0.0030	0.0140	6.3	740.0	77.4	0.70	0.00029	11.7	50.0	20.0	41.0	11.1	4.9	
		Aug-24	Quarterly																			
		Sep-24																				
		Oct-24	26/11/24	24114228-011	314	<	0.030	1.2500	0.004	0.0110	6.4	1060.0	62.4	3.70	0.00194	11.6	57.0	20.0	50.0	6.2	3.2	
		Nov-24	Quarterly																			
		Dec-24																				
SST East S3	GW10	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	12/06/24	24052866-012	377.6	<	0.030	2.09	0.008	0.007	6.9	549	2.4	<	0.1	0.00016	10.8	11	30	75	8.3	9.14
		May-24	Quarterly																			
		Jun-24																				
		Jul-24	17/10/24	24102838-012	215	<	0.030	2.1900	0.0080	0.0050	6.9	578.0	242.0	0.70	0.00115	11.5	7.0	36.0	83.0	10.2	6.1	
		Aug-24	Quarterly																			
		Sep-24																				
		Oct-24	26/11/24	24114228-012	169	<	0.030	3.9600	0.009	0.0030	6.8	408.0	159	0.40	0.00054	11.8	8.0	27.0	59.0	6.9	4.5	
		Nov-24	Quarterly																			
		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^{(10.055-(0.0324*°C)-pH)}), where T°C is measured water temperature.
^ Ammonia result confirmed on duplicate analysis.

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			
Date monitored																													
GMW2	Red Valve	0	0	0.1	0	0	0.1	0	0.1	0.1	0.1	0.1	0.1	0.2	0.4	0.3	0.6	0.6	1.5	0.6	1.6	1.4	0.8	0.7	0.5	Red Valve, 25.5m depth	GMW2		
	Yellow Valve	0	0	0	0	0	0.1	0	0.1	0.1	0.1	0.1	0.1	0	0	0	0.1	0.1	0.3	0	0.2	0.2	0	0.1	0.1	Yellow Valve,14m depth			
	White Valve	0.1	0.1	0.1	0.1	0	0.1	0	0.1	0.1	0.1	0.1	0.1	0	0.2	0.2	8.4	2.6	0.1	0	0	0	8	0.1	0.1	White Valve, 4m depth			
	Trigger Levels	1												Trigger Levels												Trigger Levels			
	Control Levels	0.5												Control Levels												Control Levels			
	Trigger Level Red	-												1.5												Trigger Level Red			
	Trigger Level Yellow	-												4.3												Trigger Level Yellow			
	Trigger Level White	-												12.1												Trigger Level White			
	Control Level Red	-												1												Control Level Red			
	Control Level Yellow	-												3.8												Control Level Yellow			
Control Level White	-												11.6												Control Level White				
GMW3	Red Valve	0.1	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.5	0.1	0.4	1	3.8	0.7	2.5	1.7	1.9	0.3	0.6	0.6	Red Valve, 19m depth	GMW3		
	Yellow Valve	0.1	0.1	0.1	0	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.3	0.2	0.1	0.2	0.8	0.15	0	0.7	1.7	0.1	0.1	0.1	Yellow Valve,9m depth			
	White Valve	0	0	0.1	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.8	0.8	1.2	0.2	1.1	0.7	0.1	0.1	1.9	0.1	0.3	0.5	White Valve, 3.5m depth			
	Trigger Levels	1												Trigger Levels												Trigger Levels			
	Control Levels	0.5												Control Levels												Control Levels			
	Trigger Level Red	-												7.3												Trigger Level Red			
	Trigger Level Yellow	-												2.67												Trigger Level Yellow			
	Trigger Level White	-												24.02												Trigger Level White			
	Control Level Red	-												6.8												Control Level Red			
	Control Level Yellow	-												2.17												Control Level Yellow			
Control Level White	-												23.5												Control Level White				
GMW4	Red Valve	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	1.5	2.1	2.1	2.7	1.8	2.4	0	0.8	0.8	0.3	0.2	0.2	Red Valve, 30m depth	GMW4		
	Yellow Valve	0	0	0	0	0.1	0	0	0.1	0.1	0.1	0.1	0.1	0	0.1	0.1	0.2	0.3	0.1	0	0.2	0.1	0.1	0.3	0.1	Yellow Valve,20m depth			
	White Valve	0	0	0	nt	0	0	0	0.1	0.1	0.1	0.1	0.1	0	0	0	nt	0	0	0	0.3	1.3	0	0.1	0.1	White Valve, 5m depth			
	Trigger Levels	1												Trigger Levels												Trigger Levels			
	Control Levels	0.5												Control Levels												Control Levels			
	Trigger Level Red	-												1.5												Trigger Level Red			
	Trigger Level Yellow	-												4.3												Trigger Level Yellow			
	Trigger Level White	-												12.1												Trigger Level White			
	Control Level Red	-												1												Control Level Red			
	Control Level Yellow	-												3.8												Control Level Yellow			
Control Level White	-												11.6												Control Level White				
GMW5	Red Valve	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	4	4.9	5.2	5.2	5	5.2	2	1.1	6.2	2	4.7	2.1	Red Valve, 26.3m depth	GMW5		
	Yellow Valve	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.5	0.3	0.4	0.4	0.2	0.2	0.3	0.3	0.7	0.4	Yellow Valve,15m depth			
	White Valve	0	0	0	0	0	0	0	0.1	0.1	0.1	0.1	0.1	2.5	2.6	3.2	3.6	2.4	3.4	1.6	3.3	2	2.8	3.9	3.5	White Valve, 5m depth			
	Trigger Levels	1												Trigger Levels												Trigger Levels			
	Control Levels	0.5												Control Levels												Control Levels			
	Trigger Level Red	-												8.48												Trigger Level Red			
	Trigger Level Yellow	-												4.1												Trigger Level Yellow			
	Trigger Level White	-												4.8												Trigger Level White			
	Control Level Red	-												7.98												Control Level Red			
	Control Level Yellow	-												3.6												Control Level Yellow			
Control Level White	-												4.3												Control Level White				
GMW6	Red Valve	0	0	0	0	0	0.1	0	0.1	0.1	0.1	0.1	0.1	2.5	2.9	2.9	2.7	2.7	4	1.2	4.5	5.6	4.4	2.2	2.1	Red Valve, 26.3m depth	GMW6		
	Yellow Valve	0	0	0	0	0	0.1	0	0.1	0.1	0.1	0.1	0.1	2.5	3.3	2.8	2.4	2.1	1.5	0.9	1.8	1.8	2.9	3.6	2.3	Yellow Valve,15m depth			
	White Valve	0	0	0	0	0	0.1	0	0.1	0	0.1	0	0.1	1.3	1.4	1.5	1.6	1.5	1.9	0.7	1.2	1.3	1.7	1.5	1.5	White Valve, 5m depth			
	Trigger Levels	1												Trigger Levels												Trigger Levels			
	Control Levels	0.5												Control Levels												Control Levels			
	Trigger Level Red	-												4.3												Trigger Level Red			
	Trigger Level Yellow	-												5												Trigger Level Yellow			
	Trigger Level White	-												3.76												Trigger Level White			
	Control Level Red	-												3.8												Control Level Red			
	Control Level Yellow	-												4.5												Control Level Yellow			
Control Level White	-												3.26												Control Level White				

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	0.1	0	0.1	0.1	0.1	0.1	0.1	0	0.2	0.1	0.2	0.3	0.5	0.1	1.5	0.9	0.4	0.6	0.2	Yellow Valve,12 depth	GMW7					
	White Valve	piezo damaged	piezo damaged	piezo damaged	0	nt	nt	nt	nt	0.1	nt	0	0.1	piezo damaged	piezo damaged	piezo damaged	0.2	nt	nt	nt	nt	0.9	nt	0	0.2	White Valve, 5m depth						
	Trigger Levels	1												-												Trigger Levels						
	Control Levels	0.5												-												Control Levels						
	Trigger Level Yellow	-												1.8												Trigger Level Yellow						
	Trigger Level White	-												1.82												Trigger Level White						
	Control Level Yellow	-												1.3												Control Level Yellow						
	Control Level White	-												1.32												Control Level White						
GMW12	Red Valve	0	0	0	0	0.1	0	0	0.1	0	0.1	0.1	0.1	1.2	1.7	1	0.8	0.3	0.9	0.3	0.3	0.4	0.5	0.4	0.6	Red Valve, 26.3m depth	GMW12					
	Yellow Valve	0	0	0	0	0.1	0	0	0.1	0	0.1	0.1	0	1.7	0.8	3.3	0.6	0.5	1.95	0.3	0.2	0.3	1.2	2.3	0.1	Yellow Valve,15m depth						
	White Valve	0	0	0	0	0.1	0	0	0.1	0	0.1	0.1	0.1	0.6	1.4	0.1	0.5	0.2	0.3	0.3	0.3	0.3	0.1	0.1	0.1	White Valve, 5m depth						
	Trigger Level Red	1.89												4.5												Trigger Level Red						
	Trigger Level Yellow	1												2.9												Trigger Level Yellow						
	Trigger Level White	1												5.5												Trigger Level White						
	Control Level Red	1.39												4												Control Level Red						
	Control Level Yellow	0.5												2.4												Control Level Yellow						
GMW13	Red Valve	0	0	1.1	0	0	0	0	0.1	0	0.1	0.1	0.1	1.2	1.7	1	0.8	0.3	0.9	0.3	0.3	0.4	0.5	0.4	0.6	Red Valve, 26.3m depth	GMW13					
	Yellow Valve	0	0	0	0	0	0	0	0.1	0	0.1	0.1	0.1	2.7	2.8	2.6	5.6	6	4.1	3.1	5.2	5.6	5.7	6.1	5.3	Yellow Valve,15m depth						
	White Valve	0	0	0	0	0	0	0	0.1	0	0.1	0.1	0.1	0	1.6	1.9	1.1	1.4	2.4	1.25	1.8	3.4	3.5	4	3.3	0.1		White Valve, 5m depth				
	Trigger Level Red	1.14												7.9												Trigger Level Red						
	Trigger Level Yellow	1.2												6												Trigger Level Yellow						
	Trigger Level White	1												5.82												Trigger Level White						
	Control Level Red	0.64												7.4												Control Level Red						
	Control Level Yellow	0.7												5.5												Control Level Yellow						
GMW14/14A	Red Valve	0	0	0.9	0	0.1	0.1	0	0.1	0	0.1	0.1	0.1	1	0.7	20.8	0.6	0	0.1	0.3	0.3	0.4	0.4	1.7	0.6	Red Valve, 26.3m depth	GMW14/14A					
	Yellow Valve	0	0	0.7	0	0.1	0.1	0	0.1	0	0.1	0.1	0	2.1	3.4	21.2	0.1	0	2.9	0.1	0	0.1	0.1	0.1	3.6	Yellow Valve,15m depth						
	White Valve	0	0	0.6	0	0.1	0.1	0	0.1	0	0.1	0.1	0	0.3	0.4	21.4	1.2	0	1.9	0	0	0	0	0.1	0.4	White Valve, 5m depth						
	Trigger Level Red	1												1.5												Trigger Level Red						
	Trigger Level Yellow	1.2												5.9												Trigger Level Yellow						
	Trigger Level White	1.2												5.4												Trigger Level White						
	Control Level Red	0.5												1												Control Level Red						
	Control Level Yellow	0.7												5.4												Control Level Yellow						
GMW1**	Red Valve	0	0.1	0	0	0	0.1	0.2	0.1	0.1	0.1	0.1	0.5	0.1	0.4	0.9	0	0	1.4	1.6	0.9	2.5	2	1.8	1.9	1.8	Red Valve, 23.5m depth	GMW1**				
	Yellow Valve	0.9	1.5	0.8	0.1	0.7	1.1	9	0.2	12.8	14	3.2	1.8	2.1	1.4	1.8	1.7	0.2	1.9	5.8	1.8	11	1.5	2.5	1.3	1.6	Yellow Valve,14.7m depth					
	White Valve	0.3	0.3	0.4	0.1	0.1	8	0.8	1.2	0.1	1.6	0.3	0.4	1.2	1.2	1.5	1.6	0.3	1	2.1	0.8	1.2	2.5	1.5	1.3	1	White Valve, 6.5m depth					
GMW8*	Yellow Valve	9.6	11.1	11.8	1.1	4	0.9	2.9	0.5	0.9	nt	9.6	9.7	6.2	6	6.3	2.3	2.3	2.3	4.3	7.9	3	4.5	nt	5.8	5.7	Yellow Valve,17.5m depth	GMW8*				
	White Valve	0	0	0	0	0	0	0.5	0.1	0.1	nt	0.1	0.1	3.9	4	4.1	3.6	3.5	3.8	5.3	5.1	0.9	nt	4.6	4.4	White Valve, 5.7m depth						
GMW9*	Red Valve	0	0	0	0	0	0.1	0	0.1	0.1	0.1	0.1	0.1	1.7	1.8	1.9	1.1	1.2	0.3	2.1	2	0.2	1	1.6	1.6	Red Valve, 27m depth	GMW9*					
	Yellow Valve	27.5	29.3	31.6	32	30.1	24.4	20.9	22.7	27.2	31.2	30.7	29.4	7.9	8.2	8.5	8.2	9.2	12	11	14.9	12	11.7	9.5	9.4	Yellow Valve,15m depth						
	White Valve	0.1	0.1	0.1	0.1	0.1	0.1	0.6	0.2	0.1	0.2	0.1	0.1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.5	0.3	0.1	0.1	0.1	White Valve, 8.5m depth						
GMW10*	Red Valve	1.1	0.1	4.4	3.8	0.1	5.6	4	5.4	5.4	6.5	0.1	18	2.8	4.5	1	2.2	4.5	2.4	1.8	12.9	2.29	2.7	1.4	2.8	Red Valve, 19.5m depth	GMW10*					
	Yellow Valve	16	7.2	23.9	26.8	28.9	30.6	29	12	0.1	45.2	41.7	41.7	2	1.9	2.4	2.8	3.1	4.1	7	14	4.5	6.7	4.8	4.8	Yellow Valve,15m depth						
	White Valve	8.7	27.2	0.1	0.1	0.2	0.5	4.1	0.8	0.1	7.8	0.1	0.1	3.6	2.9	4	7.1	4.6	9	2	9.6	3.3	4.2	5.4	2.2	White Valve, 8m depth						
GMW17**	Red Valve	0	0	1.5	0	0	0	0	0.1	0	nt	nt	0.1	0.7	0	15.9	1.3	1.2	1	0.8	1.4	1.3	nt	nt	6.8	Red Valve, 26.3m depth	GMW17**					
	Yellow Valve	0	0	5.4	0	0	0.1	0	0.1	0	nt	nt	0.1	5.2	5.3	10.7	5.7	5.6	5.2	6.1	3.8	3.6	nt	nt	1.4	Yellow Valve,15m depth						
	White Valve	0	0	3.5	0	0	0.1	0	0.1	0	nt	nt	0	3.6	4	17.5	3.9	3.5	3.7	5.2	4	3.5	nt	nt	3.1	White Valve, 5m depth						
GMW18**	Yellow Valve	0	0	0	0	nt	0	0	0	0	0.1	0.1	0.1	0	0.2	5.4	21.6	2	nt	1	0.1	1.5	0	0	1	1.1	Yellow Valve,12 depth	GMW18**				
	White Valve	0	0	6	0	0	0	0	0.1	0	0.1	0.1	0	5.4	5.4	17.2	5.3	5.4	4.2	2	4.3	3.5	6.5	6	6.4	White Valve, 5m depth						

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
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
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
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
29/03/2024	18.05	20.03	6.90	8.68	4.29	6.72	9.98	10.03	1.98	1.78	2.43	0.05
04/04/2024	18.20	20.03	6.98	8.67	4.20	6.72	9.99	10.12	1.83	1.69	2.52	0.13
22/04/2024	18.32	20.02	7.01	8.68	4.44	6.74	10.00	10.02	1.70	1.67	2.30	0.02
26/04/2024	18.35	20.03	7.12	8.68	4.44	6.72	9.99	10.03	1.68	1.56	2.28	0.04
03/05/2024	18.39	20.03	7.91	8.69	4.46	6.73	10.02	10.12	1.64	0.78	2.27	0.10
10/05/2024	18.32	20.03	7.69	8.69	4.52	6.73	10.10	10.12	1.71	1.00	2.21	0.02
17/05/2024	18.42	20.03	7.78	8.69	4.92	6.73	10.01	10.12	1.61	0.91	1.81	0.11

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
24/05/2024	18.41	20.03	7.93	8.69	4.68	6.73	10.05	10.12	1.62	0.76	2.05	0.07
30/05/2024	18.43	20.03	8.03	8.69	4.70	6.73	10.03	10.12	1.60	0.66	2.03	0.09
13/06/2024	18.41	20.03	8.43	8.69	4.77	6.73	10.05	10.12	1.62	0.26	1.96	0.07
20/06/2024	18.38	20.03	7.90	8.69	4.82	6.73	9.99	10.12	1.65	0.79	1.91	0.13
28/06/2024	18.40	20.03	7.76	8.69	4.90	6.73	10.01	10.12	1.63	0.93	1.83	0.11
05/07/2024	18.41	20.03	7.79	8.69	4.86	6.73	10.08	10.12	1.62	0.90	1.87	0.04
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	7.9	8.69	4.8	6.74	9.98	10.13	1.41	0.79	1.94	0.15
20/07/2023	18.51	20.02	8.59	8.7	5.33	6.75	10.08	10.14	1.51	0.11	1.42	0.06
28/07/2023	18.6	20.01	8.1	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	8.6	8.71	5.23	6.74	10.07	10.1	1.44	0.11	1.51	0.03
10/08/2023	18.7	20.02	7.79	8.69	4.98	6.72	10.01	10.13	1.32	0.9	1.74	0.12
17/08/2023	18.6	20.01	7.79	8.69	4.98	6.72	10.01	10.13	1.41	0.9	1.74	0.12
23/08/2023	18.56	20.01	7.8	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	8.5	8.69	4.5	6.74	10.02	10.12	1.51	0.19	2.24	0.1
22/09/2023	18.62	20.02	8.52	8.69	5.15	6.73	10.03	10.12	1.4	0.17	1.58	0.09
27/09/2023	18.59	20.03	8.46	8.69	5	6.73	10.01	10.13	1.44	0.23	1.73	0.12
05/10/2023	18.5	20.02	7.49	8.69	4.8	6.73	10.01	10.12	1.52	1.2	1.93	0.11
12/10/2023	18.5	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	4.3	6.72	9.99	10.13	1.49	1.47	2.42	0.14
23/10/2023	18.6	20.01	7.4	8.69	4.82	6.72	9.98	10.12	1.41	1.29	1.9	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	18.5	20.03	6.7	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	6.8	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	4.7	6.73	10.1	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	0.1
14/12/2023	18.48	20.02	7.1	8.68	4.58	6.73	9.97	10.12	1.54	1.58	2.15	0.15
18/12/2023	18.42	20	7.16	8.68	4.41	6.75	10	10.1	1.58	1.52	2.34	0.1
29/12/2023	18.43	20.03	7.01	8.68	4.5	6.75	9.98	10.12	1.6	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	9.9	10.1	1.63	2.12	2.47	0.2
19/01/2024	18.39	20.02	6.56	8.68	4.27	6.74	9.9	10.1	1.63	2.12	2.47	0.2
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	18.5	20.02	7.19	8.68	4.42	6.74	10	10.12	1.52	1.49	2.32	0.12
09/02/2024	18.51	20.02	7.27	8.68	4.6	6.74	10.1	10.12	1.51	1.41	2.14	0.02
16/02/2024	18.47	20.02	7.1	8.68	4.44	6.74	9.99	10.12	1.55	1.58	2.3	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	4.4	6.74	10	10.1	1.6	1.52	2.34	0.1
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	1.8	2.36	0.18
22/03/2024	18.4	20.03	6.99	8.68	4.41	6.74	9.9	10.02	1.63	1.69	2.33	0.12
29/03/2024	18.05	20.03	6.9	8.68	4.29	6.72	9.98	10.03	1.98	1.78	2.43	0.05
04/04/2024	18.2	20.03	6.98	8.67	4.2	6.72	9.99	10.12	1.83	1.69	2.52	0.13
22/04/2024	18.32	20.02	7.01	8.68	4.44	6.74	10	10.02	1.7	1.67	2.3	0.02
26/04/2024	18.35	20.03	7.12	8.68	4.44	6.72	9.99	10.03	1.68	1.56	2.28	0.04
03/05/2024	18.39	20.03	7.91	8.69	4.46	6.73	10.02	10.12	1.64	0.78	2.27	0.1
10/05/2024	18.32	20.03	7.69	8.69	4.52	6.73	10.1	10.12	1.71	1	2.21	0.02
17/05/2024	18.42	20.03	7.78	8.69	4.92	6.73	10.01	10.12	1.61	0.91	1.81	0.11
24/05/2024	18.41	20.03	7.93	8.69	4.68	6.73	10.05	10.12	1.62	0.76	2.05	0.07
30/05/2024	18.43	20.03	8.03	8.69	4.7	6.73	10.03	10.12	1.6	0.66	2.03	0.09
13/06/2024	18.41	20.03	8.43	8.69	4.77	6.73	10.05	10.12	1.62	0.26	1.96	0.07
20/06/2024	18.38	20.03	7.9	8.69	4.82	6.73	9.99	10.12	1.65	0.79	1.91	0.13
28/06/2024	18.4	20.03	7.76	8.69	4.9	6.73	10.01	10.12	1.63	0.93	1.83	0.11
05/07/2024	18.41	20.03	7.79	8.69	4.86	6.73	10.08	10.12	1.62	0.9	1.87	0.04
12/07/2024	18.62	20.03	8.52	8.69	5.15	6.73	10	10.12	1.41	0.17	1.58	0.12
19/07/2024	18.5	20.03	8.36	8.69	4.99	6.73	9.99	10.12	1.53	0.33	1.74	0.13
26/07/2024	18.41	20.03	7.9	8.69	4.86	6.73	10.01	10.12	1.62	0.79	1.87	0.11
02/08/2024	18.39	20.03	7.98	8.69	4.81	6.73	10.02	10.12	1.64	0.71	1.92	0.1
09/08/2024	18.42	20.03	8.01	8.69	4.88	6.73	10	10.12	1.61	0.68	1.85	0.12
16/08/2024	18.38	20.03	7.87	8.69	4.93	6.73	10.01	10.12	1.65	0.82	1.8	0.11
23/08/2024	18.65	20.03	7.9	8.69	4.98	6.73	9.99	10.12	1.38	0.79	1.75	0.13
30/08/2024	18.45	20.03	7.79	8.69	5.36	6.73	9.96	10.12	1.58	0.9	1.37	0.16
06/09/2024	18.39	20.03	7.9	8.68	4.38	6.73	9.98	10.13	1.64	0.78	2.35	0.15
12/09/2024	18.4	20.02	6.9	8.62	4.99	6.73	10.01	10.02	1.62	1.72	1.74	0.01
20/09/2024	18.64	20.03	7.9	8.69	5.1	6.73	9.98	10.13	1.39	0.79	1.63	0.15

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
27/09/2024	18.68	20.02	6.99	8.67	5.09	6.73	10	10.02	1.34	1.68	1.64	0.02
04/10/2024	18.63	20.04	6.9	8.67	5.11	6.74	10	10.12	1.41	1.77	1.63	0.12
11/10/2024	18.66	20.03	7.3	8.67	5	6.74	9.9	10.12	1.37	1.37	1.74	0.22
18/10/2024	18.6	20.2	7.85	8.67	4.9	6.74	9.7	10.12	1.6	0.82	1.84	0.42
25/10/2024	18.50	20.80	7.75	8.70	4.78	6.76	9.22	10.10	2.30	0.95	1.98	0.88
01/11/2024	18.64	20.02	7.50	8.68	4.65	6.74	9.82	10.02	1.38	1.18	2.09	0.20
08/11/2024	18.44	20.06	7.73	8.68	4.80	6.76	9.28	10.04	1.62	0.95	1.96	0.76
15/11/2024	18.52	20.04	7.71	8.64	4.76	6.78	9.24	10.06	1.52	0.93	2.02	0.82
22/11/2024	18.54	20.06	7.68	8.68	4.70	6.76	9.22	10.06	1.52	1.00	2.06	0.84
29/11/2024	18.47	20.08	7.78	8.76	4.84	6.74	9.72	10.60	1.61	0.98	1.90	0.88
09/12/2024	18.52	20.06	7.74	8.74	4.90	6.74	9.78	10.04	1.54	1.00	1.84	0.26
16/12/2024	18.48	20.80	7.78	8.76	4.82	6.74	9.72	10.02	2.32	0.98	1.92	0.30
23/12/2024	18.92	20.04	7.69	8.76	4.88	6.72	9.76	10.04	1.12	1.07	1.84	0.28
03/01/2025	18.41	20.02	7.79	8.69	4.95	6.73	10.02	10.12	1.61	0.90	1.78	0.10
10/01/2025	18.38	20.04	7.78	8.70	4.92	6.74	10.04	10.10	1.66	0.92	1.82	0.06