

Caulmert Limited

Engineering, Environmental & Planning
Consultancy Services

Standard Landfill Site

Flintshire County Council Waste Management Services

Environmental Management 2022

Quarterly Monitoring Review October – December 2022

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Quarterly Monitoring Review October – December 2022

TABLE OF CONTENTS

1.0	INTRODUCTION	1
	1.1 Background	1
2.0	LANDFILL GAS	2
	2.1 Introduction	2
	2.2 Methane.....	2
	2.3 Carbon Dioxide.....	2
	2.4 Carbon Monoxide and Hydrogen Sulphide.....	2
3.0	LEACHATE.....	3
	3.1 Introduction	3
	3.2 Leachate Levels	3
	3.3 Leachate Quality	3
4.0	GROUNDWATER	5
	4.1 Introduction	5
	4.2 Groundwater Levels.....	5
	4.3 Groundwater Quality	5
5.0	SURFACE WATER.....	7
	5.1 Introduction	7
	5.2 Surface Water Quality.....	7
6.0	CONCLUSIONS	8
	6.1 Landfill gas	8
	6.2 Leachate.....	8
	6.3 Groundwater.....	8
	6.4 Surface Water	8

DRAWINGS

0987/1/002 Environmental Monitoring Locations

APPENDICES

Appendix 1	Landfill Gas Monitoring Data
Appendix 2	Leachate Monitoring Data
Appendix 3	Groundwater Monitoring Data
Appendix 4	Surface Water Monitoring Data

1.0 INTRODUCTION

1.1 Background

- 1.1.1 This report reviews environmental monitoring data collected during the fourth quarter (October to December) of 2022 at Standard Landfill Site, Buckley, as required by Natural Resources Wales (NRW). All gas and dip data reviewed by this report was collected between the 1st of October and the 31st of December 2022 in accordance with the Environmental Permit (EPR), ref. EPR/BP3390VA and the Standard Landfill Closure Plan ref. 3031-CAU-XX-XX-RP-V-0304.A0-C3.
- 1.1.2 This report records and discusses the monitoring data collected for landfill gas, leachate, groundwater, and surface water at Standard Landfill Site. For details regarding the site location, surrounding land use, site history and development, and environmental context please refer to the Standard Landfill Site Annual Monitoring Review 2021, document ref. 4885-CAU-XX-XX-RP-V-0311.A0-C1, submitted separately to NRW by Caulmert Limited, on behalf of Flintshire County Council Waste Management Services, in January 2022.

2.0 LANDFILL GAS

2.1 Introduction

- 2.1.1 Routine landfill gas (LFG) monitoring was carried out monthly at 28 perimeter boreholes during the review period. Methane, carbon dioxide, oxygen, relative pressure, and atmospheric pressure were recorded at each borehole.
- 2.1.2 Borehole locations are shown on the attached drawing 'Environmental Monitoring Locations' ref. 0987/1/002. A summary table displaying methane and carbon dioxide concentrations can be found in Appendix 1.
- 2.1.3 An active gas extraction system comprising a 235 KW Engine and Flare is operated at the site.

2.2 Methane

- 2.2.1 As observed in previous review periods, methane was only detected in BH22, where a maximum concentration of 0.1 % was recorded. Concentrations are comparable to those detected in Q1, Q2 and Q3 in 2022.
- 2.2.2 A methane compliance limit of 1.0 % was proposed for BH22 in the EPR Compliance Assessment Report (CAR) ID 37073/0202764 issued by Natural Resources Wales (NRW) on the 27th of February 2014. The proposed compliance limit was not exceeded at BH22 during this review period.

2.3 Carbon Dioxide

- 2.3.1 Carbon dioxide compliance limits were agreed with the Environment Agency (now NRW) during Quarter 3 of 2011 and can be found in Appendix 1 along with the monitoring data. The carbon dioxide compliance limit for boreholes BH16 and BH22, 3.0 % and 3.1 % respectively, were approved in the EPR Compliance Assessment Report (CAR) ID 37073/0202764.
- 2.3.2 Maximum carbon dioxide concentrations ranged between 0.6 % and 2.1 % during Q4 of 2022. No carbon dioxide compliance limits were exceeded during this review period.

2.4 Carbon Monoxide and Hydrogen Sulphide

- 2.4.1 No carbon monoxide or hydrogen sulphide was detected at any of the monitoring locations throughout this review period.

3.0 LEACHATE

3.1 Introduction

3.1.1 Leachate levels were recorded monthly at nine leachate monitoring locations, LC2.1, LC3, LC4, LC7, S1, S2, S3, SSR5 (LS5) and SSR6 (LS6). As in the previous quarter, the nearest well to LC2 was sampled (LC2.1) as there was no access to LC2.

3.1.2 Well locations are shown on the enclosed Environmental Monitoring Location drawing.

3.2 Leachate Levels

3.2.1 Leachate levels were recorded monthly. A table of leachate levels, in metres below ground level (mBGL) and metres above Ordnance Datum (mAOD), can be found in Appendix 2.

3.2.2 Table 1 below displays minimum, maximum, and average leachate head levels in metres above the well base. Leachate levels remained below the 2m above the well base compliance limit throughout the review period at all locations. Average leachate head levels ranged from 1.15 m in LC2.1 to 1.72 m in LC7. The base levels are, however, unconfirmed and the accuracy of these leachate ‘head’ figures cannot be verified.

3.2.3 The meters above ordnance datum (mAOD) calculations for all locations is based on recent top of well surveys and dip to liquid levels.

Table 1: Leachate Head Levels (in metres above well base)

Location	Leachate Head (m)		
	Min	Max	Average
LC2.1	1.14	1.16	1.15
LC3	1.54	1.57	1.56
LC4	1.21	1.28	1.25
LC7	1.71	1.74	1.72
LS5	1.24	1.27	1.26
LS6	1.19	1.20	1.19
S1	1.28	1.30	1.29
S2	1.65	1.71	1.69
S3	1.34	1.38	1.36

3.3 Leachate Quality

3.3.1 A summary of the leachate quality is shown in Appendix 2. The quarterly parameters were sampled once during November 2022. An Annual Suite was already undertaken in September 2022, but another Annual Suite was also undertaken in November 2022.

3.3.2 Concentrations of ammoniacal nitrogen (as N) within the leachate ranged from 15 mg/l (S2) to 1400 mg/l (LC2.1) during Q4. This is comparable to the previous quarter minimum and maximum concentrations of 358 mg/l (S1) and 1500 mg/l (LC2.1).

- 3.3.3 Chloride concentrations were slightly lower than those detected during the previous review period, with maximum concentrations recorded as 1950 mg/l.
- 3.3.4 Chemical oxygen demand (COD) concentrations were highest in LC2.1 (2050 mg/l). A minimum COD concentration of 59.9 mg/l was detected at S2.
- 3.3.5 On average pH concentrations remained relatively neutral at 7.8. Concentrations were comparable to those of the previous review period, with concentrations ranging from 7.35 (LC4) to 8.29 (SSR6).
- 3.3.6 Concentrations of magnesium, potassium and sodium remained comparable to those reported in the previous quarter.
- 3.3.7 Parameters monitored as part of the annual suite are presented in appendix 2. Those detected above the laboratory detection limit are shown in Table 2 below.

Table 2: Detected Annual Suite Parameters

Parameter	Unit	HT	LC2	LC3	LC4	LC7	S1	S2	S3	SSR5	SSR6
Date sampled: 29/11/2022											
Semi-Volatile Organic Compounds (SVOCs)											
2,4-Dimethylphenol (aq)	mg/l	<0.02	0.0217	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Volatile Organic Compounds (VOCs)											
1,2,4-Trimethylbenzene	mg/l	0.00526	0.021	<0.001	<0.001	0.0088	0.00162	<0.001	0.00156	0.00581	0.00546
1,3,5-Trimethylbenzene	mg/l	0.0025	0.00422	<0.001	<0.001	0.00424	0.00479	<0.001	0.00182	0.0026	0.00224
1,4-Dichlorobenzene	mg/l	0.00181	0.00271	<0.001	0.00123	0.0026	0.00147	<0.001	<0.001	0.00184	0.00175
4-Bromofluorobenzene**	%	99.6	98.1	99.4	101	98.6	98.7	98.5	99.2	98.5	97.8
4-iso-Propyltoluene	mg/l	0.00149	0.0101	<0.001	<0.001	0.00799	0.02	<0.001	0.00732	0.00183	0.00194
Benzene	mg/l	0.00322	0.00451	<0.001	0.00152	0.00429	0.00173	<0.001	0.00126	0.00308	0.00292
Bromoform	mg/l	<0.001	<0.001	<0.001	<0.001	0.00126	<0.001	<0.001	<0.001	<0.001	<0.001
Chlorobenzene	mg/l	0.00284	0.00789	0.00103	0.0026	0.00678	<0.001	<0.001	<0.001	0.00287	0.0032
Chloroethane	mg/l	<0.001	<0.001	0.00182	0.00481	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dibromofluoromethane**	%	104	103	104	108	104	106	107	108	105	104
Ethylbenzene	mg/l	0.00362	0.0171	<0.001	<0.001	0.00554	<0.001	<0.001	<0.001	0.00448	0.00441
Isopropylbenzene	mg/l	<0.001	0.00461	<0.001	<0.001	0.00149	<0.001	<0.001	<0.001	<0.001	<0.001
m,p-Xylene	mg/l	0.00844	0.0362	<0.001	<0.001	0.021	0.00647	<0.001	0.00288	0.00891	0.0077
Naphthalene	mg/l	0.00343	0.0113	<0.001	<0.001	0.0088	<0.001	<0.001	0.00274	0.00403	0.00337
o-Xylene	mg/l	0.0109	0.016	<0.001	<0.001	0.014	0.014	<0.001	0.00668	0.0111	0.0101
Propylbenzene	mg/l	<0.001	0.00112	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/l	0.00204	0.00831	<0.001	<0.001	0.00678	0.00574	<0.001	0.0045	0.002	0.00191
Toluene-d8**	%	98.1	98.3	99.5	99	98.8	98.3	99.4	98.5	98.9	98.5

4.0 GROUNDWATER

4.1 Introduction

- 4.1.1 During the review period, groundwater levels were recorded monthly at eight groundwater monitoring boreholes, GW1, GW2, GW2R, GW3, GW4, GW5, GW6 and GW7R. Location GW2R was installed in October 2016 to replace GW2. Samples collected at these locations were analysed for the quarterly suite of substances in November 2022.

4.2 Groundwater Levels

- 4.2.1 Groundwater level data was recorded monthly in metres below ground level (mBGL) in October, November and December 2022. Where borehole cover level in Ordnance Datum was available, this was used to calculate the groundwater level in metres Above Ordnance Datum (mAOD).
- 4.2.2 Groundwater levels, in mBGL and mAOD are displayed in a summary table included in Appendix 3. Groundwater levels in Q4 remained consistently at the elevated levels, after an increase in Q3.

4.3 Groundwater Quality

- 4.3.1 A groundwater quality summary table for this review period is included in Appendix 3 for quarterly and annual parameters. The quarterly parameters were tested for during this quarter in November 2022. The annual suite of semi-volatile organic compounds (SVOCs), volatile organic compounds (VOCs), combined pesticides and herbicides and miscellaneous organics was also completed on this occasion.
- 4.3.2 As in previous quarters, concentrations of ammoniacal nitrogen (as N) were detected above the limit of detection only at GW3 during Q4, at a concentration of 0.923 mg/l (as N). All other groundwater monitoring locations were below the limit of detection (<0.3 mg/l) for ammoniacal nitrogen as N.
- 4.3.3 The average chloride concentration across the site during Quarter 4 of 2022 was 37.56 mg/l, comparable to Q3 where the average chloride concentration was 36.7 mg/l. Chloride concentrations ranged from 8.1 mg/l (GW5) to 53.8 mg/l (GW1) during Q4.
- 4.3.4 Concentrations of COD remained comparable to the previous review at all locations. COD concentrations ranged from 7.69 mg/l in GW3 to 398 mg/l in GW5 during Q4 of 2022.
- 4.3.5 During this review period, cyanide and all phenols remained below the laboratory limit of detection at all locations. Arsenic, cadmium, nickel and mercury were also detected in negligible quantities during Q4.
- 3.1.1 During this monitoring round, potassium and sodium concentrations showed a slight decrease when compared to Q3 in all locations. Sulphate and pH concentrations remained comparable to the previous quarter.

- 3.1.2 There were no semi-volatile organic compounds (SVOCs), combined pesticides and herbicides or miscellaneous organic substances detected above the laboratory limit of detection during Q4 2022. Volatile organic compounds were only tested for in the sample for GW1 and none were detected.

5.0 SURFACE WATER

5.1 Introduction

- 5.1.1 Surface water samples were collected at 3 locations, SW4, SW5 and SW6, for the quarterly suite on the 29th of November 2022. The laboratory testing results can be found in Appendix 4.

5.2 Surface Water Quality

- 5.2.1 Ammoniacal nitrogen, as both N and NH₄, were below the laboratory limit of detection at all locations during Q4. Therefore, the compliance limit of 1.0 mg/l for SW5 was not exceeded.
- 5.2.2 Chloride concentrations during Q4 showed a slight increase during Q4 when compared to those observed during the previous quarter, with concentrations of 35.3 mg/l, 30.7 mg/l and 31.1 mg/l in Q4 detected at SW4, SW5 and SW6 respectively. The chloride concentration in SW5 did not exceed the compliance limit of 105 mg/l.
- 5.2.3 COD concentrations decreased again in Q4 (a declining trend since Q2 and Q3) at SW5 and SW6, following high concentrations reported in the previous quarter. Concentrations decreased from 974 mg/l (Q2) to 81.7 mg/l (Q3) to 36.2 mg/l (Q4) at SW5 and from 2160 mg/l (Q2) to 90.1 mg/l (Q3) to 34.8 mg/l (Q4) at SW6. Concentrations at SW4 also showed a decrease from 35 mg/l in Q3 to 15.3 mg/l in Q4 2022.
- 5.2.4 Biological oxygen demand (BOD) concentrations showed a slight increase in SW5 and SW6 from Q3 to Q4. Concentrations at locations SW5 and SW6 were reported as 6.29 mg/l and 6.03 mg/l respectively in Q4, whereas in Q3 they were at 4.88 mg/l and 5 mg/l respectively. Concentrations at SW4 were reported at the detection limit of <1 mg/l in both Q3 and Q4.
- 5.2.5 Nitrate and total oxidised nitrogen concentrations showed a slight increase in Q4, with concentrations above limits of detection at all surface water monitoring points, however still at very low concentrations.
- 5.2.6 Sulphate concentrations at all locations showed an increase compared to those reported in the previous review, with concentrations ranging from 112 mg/l (SW4) to 194 mg/l (SW6) in Q4, higher than Q3 when they ranged from 47.4 mg/l (SW5) to 101 mg/l (SW4).
- 5.2.7 SW5 and SW6 showed a decrease in iron concentrations in comparison to the previous quarter with concentrations decreasing from 1.54 mg/l in SW5 in Q3 to 0.509 mg/l in Q4 and from 1.46 mg/l in SW6 in Q3 to 0.318 mg/l in Q4. Iron concentrations at SW4 remained comparable to the previous review with a concentration of 0.034 mg/l.
- 5.2.8 pH was near neutral at all locations, ranging from 7.36 in SW5 to 7.51 in SW4 during Q4.

6.0 CONCLUSIONS

6.1 Landfill gas

- 6.1.1 None of the permitted compliance limits for methane or carbon dioxide were exceeded during this review period.
- 6.1.2 As in the previous review, methane was only detected in BH22 with a maximum concentration of 0.1 % recorded, thus remaining below the compliance limit of 1.0 % throughout the review period.
- 6.1.3 No carbon monoxide or hydrogen sulphide was detected.

6.2 Leachate

- 6.2.1 Leachate levels remained compliant for the duration of the Quarter 4 review period. These levels, when converted to meters above ordnance datum, were comparable to those detected during the previous reviews.
- 6.2.2 Concentrations of all leachate quality parameters recorded were comparable to those observed previously.

6.3 Groundwater

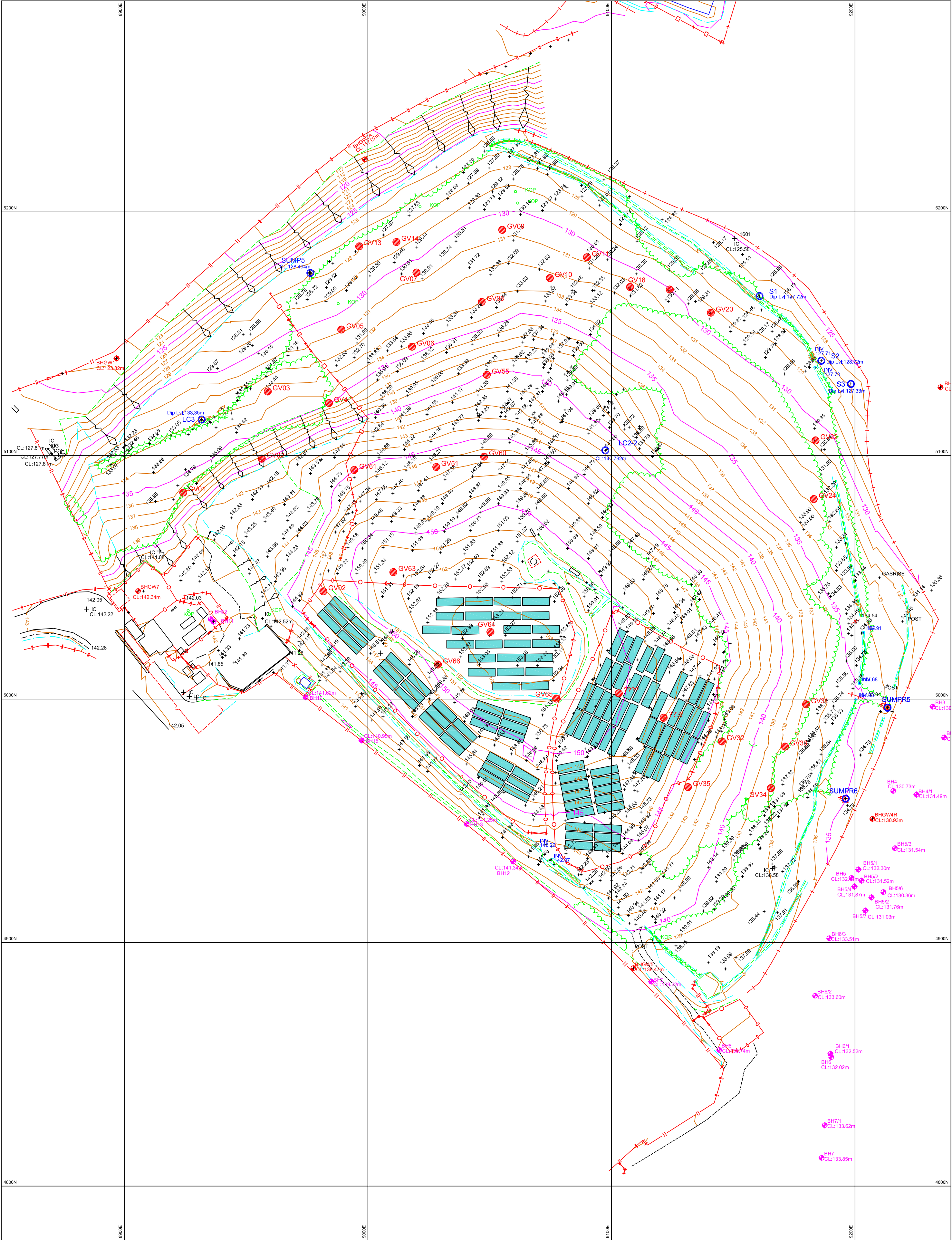
- 6.3.1 Groundwater levels remained consistently higher during Q4, after the increase across the site detected in Q3. This reflects seasonal trends of higher water levels during the winter months.
- 6.3.2 Ammoniacal nitrogen as N was only detected at GW3, with all other locations below the limit of detection, which is comparable to previous review periods in 2022.
- 6.3.3 Chloride and COD concentrations varied across the site during Q4, with concentrations comparable to those observed during Q3.
- 6.3.4 Cyanide and all phenols stayed below the detection limit at all locations during this review period. Mercury, arsenic, nickel, and cadmium were detected in negligible quantities.

6.4 Surface Water

- 6.4.1 Ammoniacal nitrogen concentrations as both N and NH₄ remained below the limit of detection throughout the review period in Q4. Chloride concentrations at all monitoring locations showed a slight increase to those observed previously, but the compliance limit of 105 mg/l for chloride at SW5 was not exceeded.
- 6.4.2 Sulphate concentrations remained comparable to the previous review, as did pH and metals iron, magnesium, potassium, sodium and calcium.

DRAWINGS

0987/1/002 Environmental Monitoring Locations



SITE

Standard
Landfill

PROJECT

Site
Survey

SCALE

1:1000 @ A2

DATE

22/07/2022

DRAWING No.

12439a

CLIENT



CYNFOR
Sir y Fflint
Flintshire
COUNTY COUNCIL
English Cymraeg

NOTES

Site Grid Shown
Levels Relate to Site Datum

 Groundwater Borehole

 Borehole

 Solar Panel

 LC5

 GV31

Leachate Well

Gas Vent Switched On



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APPENDIX 1

Landfill Gas Monitoring Data

APPENDIX 1

Table 1 – Summary of Landfill Gas Concentrations

ID	Methane					Carbon Dioxide				
	Min	Max	Average	Count	Trigger	Min	Max	Average	Count	Trigger
BH 1	0.0	0.0	0.0	3	1	1.1	1.2	1.17	3	5.4
BH 1.1	0.0	0.0	0.0	3	1	1.3	1.6	1.43	3	5.4
BH 12	0.0	0.0	0.0	3	1	0.8	1.3	1.00	3	7
BH 13	0.0	0.0	0.0	3	1	1.0	1.4	1.20	3	7.6
BH 15	0.0	0.0	0.0	3	1	1.2	1.5	1.37	3	5.8
BH 16	0.0	0.0	0.0	3	1	0.6	1.2	0.87	3	3
BH 2.0	0.0	0.0	0.0	3	1	0.9	1.5	1.17	3	7.8
BH 2.1	0.0	0.0	0.0	3	10	1.2	1.5	1.37	3	10.6
BH 2.2	0.0	0.0	0.0	3	1	1.1	1.3	1.20	3	7.1
BH 22	0.1	0.1	0.1	3	1	1.1	1.8	1.37	3	3.1
BH 3.0	0.0	0.0	0.0	3	15	1.4	1.7	1.53	3	19.4
BH 3.1	0.0	0.0	0.0	3	1	1.1	1.5	1.27	3	5.8
BH 4.0	0.0	0.0	0.0	3	1	1.0	1.5	1.20	3	9.6
BH 4.1	0.0	0.0	0.0	3	1	1.3	1.5	1.40	3	6
BH 4.2	0.0	0.0	0.0	3	1	1.1	2.1	1.47	3	16
BH 5.0	0.0	0.0	0.0	3	1	1.2	1.4	1.30	3	17.1
BH 5.1	0.0	0.0	0.0	3	1	0.6	1.4	0.90	3	7.1
BH 5.2	0.0	0.0	0.0	3	1	1.1	1.6	1.30	3	5.4
BH 5.3	0.0	0.0	0.0	3	1	1.5	1.9	1.67	3	5.4
BH 5.4	0.0	0.0	0.0	3	1	0.8	1.3	1.00	3	8.3
BH 5.5	0.0	0.0	0.0	3	1	1.2	1.6	1.43	3	3
BH 5.7	0.0	0.0	0.0	3	1.6	1.2	1.3	1.27	3	3.1
BH 6.0	0.0	0.0	0.0	3	1	1.2	1.3	1.23	3	5.4
BH 6.1	0.0	0.0	0.0	3	1	1.2	1.5	1.33	3	8.2
BH 6.2	0.0	0.0	0.0	3	1	1.2	1.5	1.37	3	6.2
BH 6.3	0.0	0.0	0.0	3	1	1.4	1.5	1.43	3	5.5
BH 7.0	0.0	0.0	0.0	3	10	1.2	1.8	1.43	3	6.5
BH 7.1	0.0	0.0	0.0	3	10	1.2	1.5	1.37	3	5.2

APPENDIX 2

Leachate Monitoring Data

APPENDIX 2

Table 2.1 - Leachate Levels

Monitoring Point	Date	Dip to liquid	Dip to Base	Leachate depth	Leachate mAOD
LC2.1	12/10/2022	29.85	31.00	1.15	111.20
	29/11/2022	29.86	31.00	1.14	111.19
	13/12/2022	29.84	31.00	1.16	111.21
LC3	12/10/2022	3.27	4.84	1.57	130.69
	29/11/2022	3.28	4.84	1.56	130.68
	13/12/2022	3.30	4.84	1.54	130.66
LC4	12/10/2022	17.79	19.00	1.21	130.86
	29/11/2022	17.72	19.00	1.28	130.93
	13/12/2022	17.75	19.00	1.25	130.90
LC7	12/10/2022	18.60	20.31	1.71	132.69
	29/11/2022	18.60	20.31	1.71	132.69
	13/12/2022	18.57	20.31	1.74	132.72
LS5	12/10/2022	28.82	32.00	1.27	104.49
	29/11/2022	28.85	32.00	1.26	104.46
	13/12/2022	28.88	32.00	1.24	104.43
LS6	12/10/2022	30.01	33.00	1.19	104.85
	29/11/2022	30.00	33.00	1.20	104.86
	13/12/2022	30.02	33.00	1.19	104.84
S1	12/10/2022	3.15	4.43	1.28	124.83
	29/11/2022	3.13	4.43	1.30	124.85
	13/12/2022	3.14	4.43	1.29	124.84
S2	12/10/2022	1.70	3.35	1.65	127.16
	29/11/2022	1.65	3.35	1.70	127.21
	13/12/2022	1.64	3.35	1.71	127.22
S3	12/10/2022	3.75	5.09	1.34	124.75
	29/11/2022	3.72	5.09	1.37	124.78
	13/12/2022	3.71	5.09	1.38	124.79

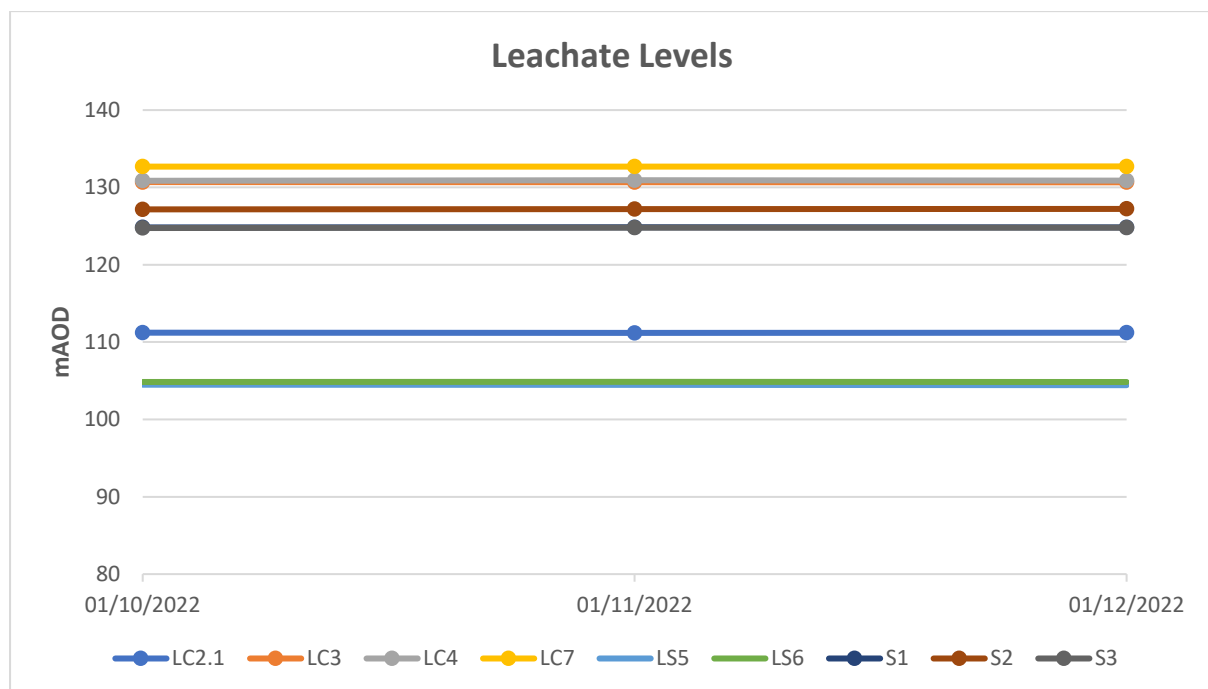


Table 2.2 - Leachate Quality Data Summary

Parameter	Unit	HT	LC2*	LC3	LC4	LC7	S1	S2	S3	SSR5	SSR6
Date sampled: 29/11/2022											
Inorganics											
Alkalinity, Total as CaCO ₃	mg/l	5630	6860	2610	1160	6570	4320	455	2610	5520	5560
Ammoniacal Nitrogen as N	mg/l	1010	1400	102	102	1090	904	15	441	1060	1060
BOD, unfiltered	mg/l	67.9	135	8.57	8.35	202	106	4.03	87.6	51.9	<25
Chloride	mg/l	1520	1950	700	213	1860	1180	68.1	671	1520	1540
Chlorine, Total (Residual)	mg/l	0.92	1.36	0.54	0.16	1.02	0.72	0.08	0.26	1.22	1.06
COD, unfiltered	mg/l	1540	2050	141	143	1810	1420	59.9	794	1490	1470
Conductivity @ 20 deg.C	mS/cm	12	15.1	6.2	2.7	14.3	9.51	1.94	6.2	11.8	11.4
pH	pH	7.76	7.68	7.84	7.35	8	7.82	8.04	7.66	7.88	8.29
Total Oxidised Nitrogen as N	mg/l	3.77	<0.5	4.47	2.02	1.21	0.153	<0.1	0.133	2.78	2.53
Filtered (Dissolved) Metals											
Magnesium (diss.filt)	mg/l	80.2	64.8	63.1	44.2	84.4	53.6	57.4	64.5	52.9	80.4
Potassium (diss.filt)	mg/l	509	652	297	92.4	676	404	17.7	250	548	524
Sodium (diss.filt)	mg/l	1230	1490	590	186	1560	984	55.4	575	1340	1260

Table 2.3 -Annual Leachate Quality Data Summary

Parameter	Unit	HT	LC2	LC3	LC4	LC7	S1	S2	S3	SSR5	SSR6
		Date sampled: 29/11/2022									
Inorganics											
Cyanide, Free	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cyanide, Total	mg/l	0.56	0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.58	0.57
Filtered (Dissolved) Metals											
Cadmium (diss.filt)	mg/l	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	<0.00008	0.000186	<0.00008	<0.00008	<0.00008
Mercury (diss.filt)	mg/l	<0.0001	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.0001
Mineral Oil / Oils & Greases											
Mineral oil >C10 C40 (aq)	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.107	<0.1	<0.1
Semi-Volatile Organic Compounds (SVOCs)											
1,2,4-Trichlorobenzene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
1,2-Dichlorobenzene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
1,3-Dichlorobenzene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
1,4-Dichlorobenzene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2,4,5-Trichlorophenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2,4,6-Trichlorophenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2,4-Dichlorophenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2,4-Dimethylphenol (aq)	mg/l	<0.02	0.0217	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2,4-Dinitrotoluene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2,6-Dinitrotoluene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2-Chloronaphthalene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2-Chlorophenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2-Methylnaphthalene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2-Methylphenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2-Nitroaniline (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
2-Nitrophenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
3-Nitroaniline (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02

Parameter	Unit	HT	LC2	LC3	LC4	LC7	S1	S2	S3	SSR5	SSR6
		Date sampled: 29/11/2022									
4-Bromophenylphenylether (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
4-Chloro-3-methylphenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
4-Chloroaniline (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
4-Chlorophenylphenylether (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
4-Methylphenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
4-Nitroaniline (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
4-Nitrophenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Acenaphthene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Acenaphthylene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Anthracene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Azobenzene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Benzo(a)anthracene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Benzo(a)pyrene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Benzo(b)fluoranthene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Benzo(g,h,i)perylene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Benzo(k)fluoranthene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
bis(2-Chloroethoxy)methane (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
bis(2-Chloroethyl)ether (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
bis(2-Ethylhexyl) phthalate (aq)	mg/l	<0.04	<0.04	<0.016	<0.02	<0.04	<0.04	<0.002	<0.2	<0.04	<0.04
Butylbenzyl phthalate (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Carbazole (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Chrysene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Dibenzo(a,h)anthracene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Dibenzofuran (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Diethyl phthalate (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02

Parameter	Unit	HT	LC2	LC3	LC4	LC7	S1	S2	S3	SSR5	SSR6
		Date sampled: 29/11/2022									
Dimethyl phthalate (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Fluoranthene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Fluorene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Hexachlorobenzene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Hexachlorobutadiene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Hexachlorocyclopentadiene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Hexachloroethane (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Indeno(1,2,3-cd)pyrene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Isophorone (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Naphthalene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
n-Dibutyl phthalate (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
n-Dioctyl phthalate (aq)	mg/l	<0.1	<0.1	<0.04	<0.05	<0.1	<0.1	<0.005	<0.5	<0.1	<0.1
Nitrobenzene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
n-Nitroso-n-dipropylamine (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Pentachlorophenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Phenanthrene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Phenol (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Pyrene (aq)	mg/l	<0.02	<0.02	<0.008	<0.01	<0.02	<0.02	<0.001	<0.1	<0.02	<0.02
Volatile Organic Compounds (VOCs)											
1,1,1,2-Tetrachloroethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,1-Trichloroethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,2,2-Tetrachloroethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1,2-Trichloroethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1-Dichloroethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1-Dichloroethene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,1-Dichloropropene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	HT	LC2	LC3	LC4	LC7	S1	S2	S3	SSR5	SSR6
		Date sampled: 29/11/2022									
1,2,3-Trichlorobenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2,3-Trichloropropane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2,4-Trichlorobenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2,4-Trimethylbenzene	mg/l	0.00526	0.021	<0.001	<0.001	0.0088	0.00162	<0.001	0.00156	0.00581	0.00546
1,2-Dibromo-3-chloropropane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dibromoethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichlorobenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichloroethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,2-Dichloropropane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,3,5-Trichlorobenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,3,5-Trimethylbenzene	mg/l	0.0025	0.00422	<0.001	<0.001	0.00424	0.00479	<0.001	0.00182	0.0026	0.00224
1,3-Dichlorobenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,3-Dichloropropane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
1,4-Dichlorobenzene	mg/l	0.00181	0.00271	<0.001	0.00123	0.0026	0.00147	<0.001	<0.001	0.00184	0.00175
2,2-Dichloropropane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
2-Chlorotoluene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
4-Chlorotoluene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
4-iso-Propyltoluene	mg/l	0.00149	0.0101	<0.001	<0.001	0.00799	0.02	<0.001	0.00732	0.00183	0.00194
Benzene	mg/l	0.00322	0.00451	<0.001	0.00152	0.00429	0.00173	<0.001	0.00126	0.00308	0.00292
Bromobenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bromochloromethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bromodichloromethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Bromoform	mg/l	<0.001	<0.001	<0.001	<0.001	0.00126	<0.001	<0.001	<0.001	<0.001	<0.001
Bromomethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Carbon disulphide	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Carbontetrachloride	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	HT	LC2	LC3	LC4	LC7	S1	S2	S3	SSR5	SSR6
		Date sampled: 29/11/2022									
Chlorobenzene	mg/l	0.00284	0.00789	0.00103	0.0026	0.00678	<0.001	<0.001	<0.001	0.00287	0.0032
Chloroethane	mg/l	<0.001	<0.001	0.00182	0.00481	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chloroform	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Chloromethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
cis-1,2-Dichloroethene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
cis-1,3-Dichloropropene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dibromochloromethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dibromomethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dichlorodifluoromethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Dichloromethane	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Ethylbenzene	mg/l	0.00362	0.0171	<0.001	<0.001	0.00554	<0.001	<0.001	<0.001	0.00448	0.00441
Hexachlorobutadiene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Isopropylbenzene	mg/l	<0.001	0.00461	<0.001	<0.001	0.00149	<0.001	<0.001	<0.001	<0.001	<0.001
m,p-Xylene	mg/l	0.00844	0.0362	<0.001	<0.001	0.021	0.00647	<0.001	0.00288	0.00891	0.0077
Methyl tertiary butyl ether (MTBE)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Naphthalene	mg/l	0.00343	0.0113	<0.001	<0.001	0.0088	<0.001	<0.001	0.00274	0.00403	0.00337
n-Butylbenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
o-Xylene	mg/l	0.0109	0.016	<0.001	<0.001	0.014	0.014	<0.001	0.00668	0.0111	0.0101
Propylbenzene	mg/l	<0.001	0.00112	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
sec-Butylbenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Styrene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
tert-Amyl methyl ether (TAME)	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
tert-Butylbenzene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tetrachloroethene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Toluene	mg/l	0.00204	0.00831	<0.001	<0.001	0.00678	0.00574	<0.001	0.0045	0.002	0.00191
trans-1,2-Dichloroethene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	HT	LC2	LC3	LC4	LC7	S1	S2	S3	SSR5	SSR6
		Date sampled: 29/11/2022									
trans-1,3-Dichloropropene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Trichloroethene	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Trichlorofluoromethane	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vinyl chloride	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Combined Pesticides / Herbicides											
Aldrin	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
alpha-HCH	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Atrazine	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Azinphos ethyl	mg/l	<0.0006	<0.0012	<0.00012	<0.00012	<0.0012	<0.00024	<0.00012	<0.0012	<0.0006	<0.0006
Azinphos methyl	mg/l	<0.0006	<0.0012	<0.00012	<0.00012	<0.0012	<0.00024	<0.00012	<0.0012	<0.0006	<0.0006
beta-HCH	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Carbophenothion	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Chlorfenvinphos	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Chlorothalonil	mg/l	<0.0005	<0.0001	<0.00005	<0.00005	<0.0005	<0.00005	<0.00005	<0.0005	<0.0005	<0.00005
Chlorpyrifos	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Chlorpyrifos-methyl	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
cis-Chlordane	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Diazinon	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Dichlorvos	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Dieldrin	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Dimethoate	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Disulfoton	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Endosulphan I	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Endosulphan II	mg/l	<0.0002	<0.0002	<0.00002	<0.00002	<0.0002	<0.0001	<0.00002	<0.0002	<0.0002	<0.0002
Endosulphan Sulphate	mg/l	<0.0002	<0.0002	<0.00002	<0.00002	<0.0002	<0.0001	<0.00002	<0.0002	<0.0002	<0.0002
Endrin	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001

Parameter	Unit	HT	LC2	LC3	LC4	LC7	S1	S2	S3	SSR5	SSR6
		Date sampled: 29/11/2022									
Ethion	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Etrimphos	mg/l	<0.0001	<0.0001	<0.00002	<0.00002	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.00005
Fenitrothion	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Fenthion	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
gamma-HCH (Lindane)	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Heptachlor	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Heptachlor epoxide	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Hexachlorobenzene	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Isodrin	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Malathion	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Methyl Parathion	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Mevinphos	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
o,p'-DDD (TDE)	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
o,p'-DDE	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
o,p'-DDT	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
p,p'-DDD (TDE)	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
p,p'-DDE	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
p,p'-DDT	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
p,p'-Methoxychlor	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Parathion	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Pendimethalin	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Permethrin I	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Permethrin II	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Phosalone	mg/l	<0.0001	<0.0002	<0.00002	<0.00002	<0.0002	<0.00004	<0.00002	<0.0002	<0.0001	<0.0001
Pirimiphos-methyl	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Propetamphos	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005

Parameter	Unit	HT	LC2	LC3	LC4	LC7	S1	S2	S3	SSR5	SSR6
		Date sampled: 29/11/2022									
Quintozene (PCNB)	mg/l	<0.0001	<0.0001	<0.00002	<0.00002	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.00005
Simazine	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Tecnazene	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Telodrin	mg/l	<0.0001	<0.0001	<0.00002	<0.00002	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.00005
trans-Chlordane	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Triadimefon	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Triallate	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Triazophos	mg/l	<0.00005	<0.0001	<0.00001	<0.00001	<0.0001	<0.00002	<0.00001	<0.0001	<0.00005	<0.00005
Trifluralin	mg/l	<0.0001	<0.0001	<0.00001	<0.00001	<0.0001	<0.00005	<0.00001	<0.0001	<0.0001	<0.0001
Miscellaneous Organics											
Dibutyl tin	mg/l	<0.00015	<0.00015	<0.00003	<0.00003	<0.00015	<0.00015	<0.00003	<0.00015	<0.00015	<0.00015
Tetrabutyl tin	mg/l	<0.00006	<0.00006	<0.000012	<0.000012	<0.00006	<0.00006	<0.000012	<0.00006	<0.00006	<0.00006
Tributyl tin	mg/l	<0.00003	<0.00003	<0.000006	<0.000006	<0.00003	<0.00003	<0.000006	<0.00003	<0.00003	<0.00003
Triphenyl tin	mg/l	<0.00003	<0.00003	<0.000006	<0.000006	<0.00003	<0.00003	<0.000006	<0.00003	<0.00003	<0.00003

APPENDIX 3

Groundwater Monitoring Data

APPENDIX 3

Table 3.1 - Groundwater Levels

Monitoring	Date	Dip-Lev (mBGL)	Ground Water Level (mAOD)
GW 1	25/10/22	35.01	89.07
	29/11/22	30.25	93.83
	13/12/22	29.97	94.11
GW 2	25/10/22	9.1	108.11
	29/11/22	9.1	108.11
	13/12/22	9.1	108.11
GW 2R	25/10/22	30.19	87.02
	29/11/22	29.54	87.67
	13/12/22	28.68	88.53
GW 3	25/10/22	33.98	79.44
	29/11/22	31.38	82.04
	13/12/22	31.29	82.13
GW 4R	25/10/22	35.02	95.98
	29/11/22	31.47	99.53
	13/12/22	31.25	99.75
GW 5	25/10/22	2.79	132.07
	29/11/22	2.64	132.22
	13/12/22	2.61	132.25
GW 6	25/10/22	25.47	98.1
	29/11/22	25.53	98.04
	13/12/22	25.01	98.56
GW 7R	25/10/22	45.89	96.11
	29/11/22	45.03	96.97
	13/12/22	44.87	97.13

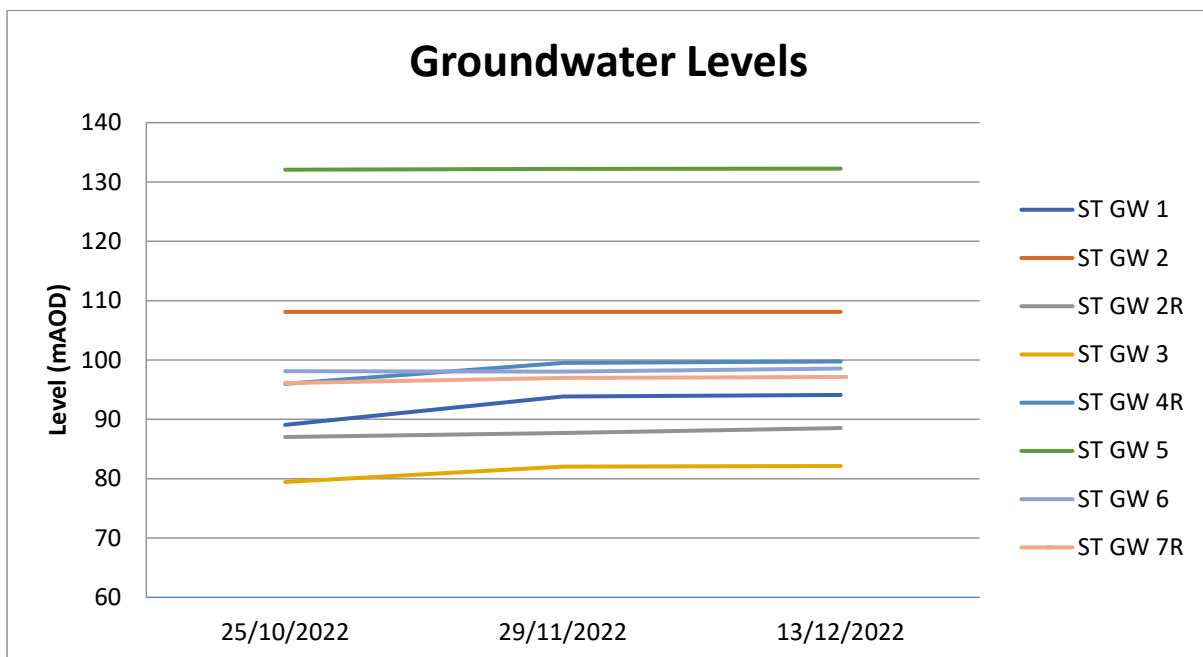


Table 3.2 - Groundwater Quality Data Summary

Parameter	Units	GW1	GW2R	GW3	GW4R	GW5	GW6	GW7
Date Sampled: 29/11/2022								
Carbon								
Organic Carbon, Total	mg/l	24.2	19.1	<3	16.4	8.14	11.3	12.9
Inorganics								
Alkalinity, Total as CaCO ₃	mg/l	59.5	60.3	192	103	90.4	182	176
Ammoniacal Nitrogen as N	mg/l	<0.2	<0.2	0.923	<0.2	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as NH ₄	mg/l	<0.3	<0.3	1.19	<0.3	<0.3	<0.3	<0.3
BOD, unfiltered	mg/l	<1	<2	<1	<2	<3	<5	<5
Chloride	mg/l	53.8	53.3	51.3	38.8	8.1	28.8	28.8
Chlorine, Total (Residual)	mg/l	0.05	0.01	0.06	0.01	0.02	0.02	0.02
COD, unfiltered	mg/l	116	56.8	7.69	51.2	398	91.7	81.1
Cyanide, Total	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate as NO ₃	mg/l	3.72	4.03	0.475	1.91	<0.3	1.43	1.3
Nitrite as NO ₂	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
pH	pH	6.66	6.86	7.76	7.57	6.98	6.82	6.84
Sulphate	mg/l	190	190	208	135	19.8	247	247
Total Oxidised Nitrogen as NO ₃	mg/l	3.72	4.03	0.475	1.91	<0.3	1.43	1.3
Filtered (Dissolved) Metals								
Arsenic (tot.unfilt)	mg/l	<0.012	<0.022	<0.002	<0.012	0.0312	0.0162	<0.012
Cadmium (tot.unfilt)	mg/l	<0.003	<0.0055	<0.0005	<0.003	<0.003	0.0135	0.00699
Calcium (Tot. Unfilt.)	mg/l	56.8	59.4	83.6	64.3	42.9	108	110
Copper (tot.unfilt)	mg/l	<0.006	<0.011	0.00208	<0.006	0.152	0.057	0.0167
Iron (Dis.Filt)	mg/l	<0.019	0.0193	<0.019	<0.019	<0.019	0.0762	<0.019
Lead (tot.unfilt)	mg/l	<0.006	<0.011	0.00101	<0.006	0.29	0.0443	0.0255
Magnesium (Dis.Filt)	mg/l	22.4	22.4	34.2	14.9	3.71	27.7	28.2
Mercury (tot.unfilt)	mg/l	0.00258	0.00629	<0.00002	0.00295	0.000344	0.000077	0.000048
Nickel (tot.unfilt)	mg/l	<0.006	<0.011	0.00152	0.00643	0.0706	0.518	0.288
Potassium (Dis.Filt)	mg/l	9.57	9.56	9.16	7.67	1.7	8.51	8.52
Sodium (Dis.Filt)	mg/l	27.6	27.8	46.7	22.9	3.75	18.9	18.9
Zinc (tot.unfilt)	mg/l	0.0525	0.107	0.0342	0.0388	0.512	0.561	0.315
Phenols								
Cresols	mg/l	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006	<0.006
Phenol	mg/l	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Phenols, Total Detected monohydric	mg/l	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Xylenols	mg/l	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008	<0.008

Table 3.3 – Annual Groundwater Quality Data Summary (highlighted means above limit of detection)

Parameter	Units	GW1	GW2R	GW3	GW4R	GW5	GW6	GW7
Inorganics								
Cyanide, Free	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cyanide, Total	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Filtered (Dissolved) Metals								
Chromium (diss.filt)	mg/l	-	-	-	-	-	-	-
Manganese (diss.filt)	mg/l	-	-	-	-	-	-	-
Mineral Oil / Oils & Greases								
Mineral oil >C10 C40 (aq)	mg/l	<0.1	<0.1	<0.1	<0.1	1.51	<0.1	<0.1
Semi-Volatile Organic Compounds (SVOCs)								
1,2,4-Trichlorobenzene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
1,2-Dichlorobenzene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
1,3-Dichlorobenzene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
1,4-Dichlorobenzene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2,4,5-Trichlorophenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2,4,6-Trichlorophenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2,4-Dichlorophenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2,4-Dimethylphenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2,4-Dinitrotoluene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2,6-Dinitrotoluene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2-Chloronaphthalene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2-Chlorophenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2-Methylnaphthalene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2-Methylphenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2-Nitroaniline (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
2-Nitrophenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
3-Nitroaniline (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
4-Bromophenylphenylether (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008

Parameter	Units	GW1	GW2R	GW3	GW4R	GW5	GW6	GW7
4-Chloro-3-methylphenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
4-Chloroaniline (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
4-Chlorophenylphenylether (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
4-Methylphenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
4-Nitroaniline (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
4-Nitrophenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Acenaphthene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Acenaphthylene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Anthracene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Azobenzene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Benzo(a)anthracene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Benzo(a)pyrene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Benzo(b)fluoranthene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Benzo(g,h,i)perylene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Benzo(k)fluoranthene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
bis(2-Chloroethoxy)methane (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
bis(2-Chloroethyl)ether (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
bis(2-Ethylhexyl) phthalate (aq)	mg/l	<0.008	<0.02	<0.002	<0.008	<0.008	<0.04	<0.016
Butylbenzyl phthalate (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Carbazole (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Chrysene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Dibenzo(a,h)anthracene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Dibenzofuran (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Diethyl phthalate (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Dimethyl phthalate (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Fluoranthene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Fluorene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Hexachlorobenzene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Hexachlorobutadiene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008

Parameter	Units	GW1	GW2R	GW3	GW4R	GW5	GW6	GW7
Hexachlorocyclopentadiene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Hexachloroethane (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Indeno(1,2,3-cd)pyrene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Isophorone (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Naphthalene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
n-Dibutyl phthalate (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
n-Dioctyl phthalate (aq)	mg/l	<0.02	<0.05	<0.005	<0.02	<0.02	<0.1	<0.04
Nitrobenzene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
n-Nitroso-n-dipropylamine (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Pentachlorophenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Phenanthrene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Phenol (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Pyrene (aq)	mg/l	<0.004	<0.01	<0.001	<0.004	<0.004	<0.02	<0.008
Volatile Organic Compounds (VOCs)								
1,1,1,2-Tetrachloroethane	mg/l	<0.001	-	-	-	-	-	-
1,1,1-Trichloroethane	mg/l	<0.001	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	mg/l	<0.001	-	-	-	-	-	-
1,1,2-Trichloroethane	mg/l	<0.001	-	-	-	-	-	-
1,1-Dichloroethane	mg/l	<0.001	-	-	-	-	-	-
1,1-Dichloroethene	mg/l	<0.001	-	-	-	-	-	-
1,1-Dichloropropene	mg/l	<0.001	-	-	-	-	-	-
1,2,3-Trichlorobenzene	mg/l	<0.001	-	-	-	-	-	-
1,2,3-Trichloropropane	mg/l	<0.001	-	-	-	-	-	-
1,2,4-Trichlorobenzene	mg/l	<0.001	-	-	-	-	-	-
1,2,4-Trimethylbenzene	mg/l	<0.001	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	mg/l	<0.001	-	-	-	-	-	-
1,2-Dibromoethane	mg/l	<0.001	-	-	-	-	-	-
1,2-Dichlorobenzene	mg/l	<0.001	-	-	-	-	-	-

Parameter	Units	GW1	GW2R	GW3	GW4R	GW5	GW6	GW7
1,2-Dichloroethane	mg/l	<0.001	-	-	-	-	-	-
1,2-Dichloropropane	mg/l	<0.001	-	-	-	-	-	-
1,3,5-Trichlorobenzene	mg/l	<0.001	-	-	-	-	-	-
1,3,5-Trimethylbenzene	mg/l	<0.001	-	-	-	-	-	-
1,3-Dichlorobenzene	mg/l	<0.001	-	-	-	-	-	-
1,3-Dichloropropane	mg/l	<0.001	-	-	-	-	-	-
1,4-Dichlorobenzene	mg/l	<0.001	-	-	-	-	-	-
2,2-Dichloropropane	mg/l	<0.001	-	-	-	-	-	-
2-Chlorotoluene	mg/l	<0.001	-	-	-	-	-	-
4-Chlorotoluene	mg/l	<0.001	-	-	-	-	-	-
4-iso-Propyltoluene	mg/l	<0.001	-	-	-	-	-	-
Benzene	mg/l	<0.001	-	-	-	-	-	-
Bromobenzene	mg/l	<0.001	-	-	-	-	-	-
Bromochloromethane	mg/l	<0.001	-	-	-	-	-	-
Bromodichloromethane	mg/l	<0.001	-	-	-	-	-	-
Bromoform	mg/l	<0.001	-	-	-	-	-	-
Bromomethane	mg/l	<0.001	-	-	-	-	-	-
Carbon disulphide	mg/l	<0.001	-	-	-	-	-	-
Carbontetrachloride	mg/l	<0.001	-	-	-	-	-	-
Chlorobenzene	mg/l	<0.001	-	-	-	-	-	-
Chloroethane	mg/l	<0.001	-	-	-	-	-	-
Chloroform	mg/l	<0.001	-	-	-	-	-	-
Chloromethane	mg/l	<0.001	-	-	-	-	-	-
cis-1,2-Dichloroethene	mg/l	<0.001	-	-	-	-	-	-
cis-1,3-Dichloropropene	mg/l	<0.001	-	-	-	-	-	-
Dibromochloromethane	mg/l	<0.001	-	-	-	-	-	-
Dibromomethane	mg/l	<0.001	-	-	-	-	-	-
Dichlorodifluoromethane	mg/l	<0.001	-	-	-	-	-	-
Dichloromethane	mg/l	<0.003	-	-	-	-	-	-

Parameter	Units	GW1	GW2R	GW3	GW4R	GW5	GW6	GW7
Ethylbenzene	mg/l	<0.001	-	-	-	-	-	-
Hexachlorobutadiene	mg/l	<0.001	-	-	-	-	-	-
Isopropylbenzene	mg/l	<0.001	-	-	-	-	-	-
m,p-Xylene	mg/l	<0.001	-	-	-	-	-	-
Methyl tertiary butyl ether (MTBE)	mg/l	<0.001	-	-	-	-	-	-
Naphthalene	mg/l	<0.001	-	-	-	-	-	-
n-Butylbenzene	mg/l	<0.001	-	-	-	-	-	-
o-Xylene	mg/l	<0.001	-	-	-	-	-	-
Propylbenzene	mg/l	<0.001	-	-	-	-	-	-
sec-Butylbenzene	mg/l	<0.001	-	-	-	-	-	-
Styrene	mg/l	<0.001	-	-	-	-	-	-
tert-Amyl methyl ether (TAME)	mg/l	<0.001	-	-	-	-	-	-
tert-Butylbenzene	mg/l	<0.001	-	-	-	-	-	-
Tetrachloroethene	mg/l	<0.001	-	-	-	-	-	-
Toluene	mg/l	<0.001	-	-	-	-	-	-
trans-1,2-Dichloroethene	mg/l	<0.001	-	-	-	-	-	-
trans-1,3-Dichloropropene	%	<0.001	-	-	-	-	-	-
Trichloroethene	mg/l	<0.001	-	-	-	-	-	-
Trichlorofluoromethane	mg/l	<0.001	-	-	-	-	-	-
Vinyl chloride	mg/l	<0.001	-	-	-	-	-	-
Combined Pesticides / Herbicides								
Aldrin	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
alpha-HCH	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Atrazine	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Azinphos ethyl	mg/l	<0.0012	<0.0012	<0.00012	<0.0012	<0.0012	<0.0012	<0.0012
Azinphos methyl	mg/l	<0.0012	<0.0012	<0.00012	<0.0012	<0.00012	<0.0012	<0.0012
beta-HCH	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Carbophenothion	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Chlorfenvinphos	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001

Parameter	Units	GW1	GW2R	GW3	GW4R	GW5	GW6	GW7
Chlorothalonil	mg/l	<0.0005	<0.0005	<0.00005	<0.0005	<0.0005	<0.001	<0.0005
Chlorpyrifos	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Chlorpyrifos-methyl	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
cis-Chlordane	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Diazinon	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Dichlorvos	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Dieldrin	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Dimethoate	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Disulfoton	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Endosulphan I	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Endosulphan II	mg/l	<0.0002	<0.0002	<0.00002	<0.0002	<0.0002	<0.0004	<0.0002
Endosulphan Sulphate	mg/l	<0.0002	<0.0002	<0.00002	<0.0002	<0.0002	<0.0004	<0.0002
Endrin	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Ethion	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Etrimphos	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Fenitrothion	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Fenthion	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
gamma-HCH (Lindane)	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Heptachlor	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Heptachlor epoxide	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Hexachlorobenzene	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Isodrin	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Malathion	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Methyl Parathion	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Mevinphos	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
o,p'-DDD (TDE)	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
o,p'-DDE	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
o,p'-DDT	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
p,p'-DDD (TDE)	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001

Parameter	Units	GW1	GW2R	GW3	GW4R	GW5	GW6	GW7
p,p'-DDE	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
p,p'-DDT	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
p,p'-Methoxychlor	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Parathion	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Pendimethalin	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Permethrin I	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Permethrin II	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Phosalone	mg/l	<0.0002	<0.0002	<0.00002	<0.0002	<0.0002	<0.0002	<0.0002
Pirimiphos-methyl	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Propetamphos	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Quintozone (PCNB)	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Simazine	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Tecnazene	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Telodrin	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
trans-Chlordane	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Triadimefon	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Triallate	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Triazophos	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001	<0.0001
Trifluralin	mg/l	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0002	<0.0001
Miscellaneous Organics								
Dibutyl tin	mg/l	<0.00003	<0.00003	<0.00003	<0.00003	<0.00015	<0.00003	<0.00003
Tetrabutyl tin	mg/l	<0.000012	<0.000012	<0.000012	<0.000012	<0.00006	<0.000012	<0.000012
Tributyl tin	mg/l	<0.000006	<0.000006	<0.000006	<0.000006	<0.00003	<0.000006	<0.000006
Triphenyl tin	mg/l	<0.000006	<0.000006	<0.000006	<0.000006	<0.00003	<0.000006	<0.000006

APPENDIX 4

Surface Water Monitoring Data

APPENDIX 4

Table 4 –Surface Water Quality

Parameter	Units	SW4	SW5	SW6
Inorganics	Date sampled: 29/11/2022			
Alkalinity, Total as CaCO ₃	mg/l	120	155	155
Ammoniacal Nitrogen as N	mg/l	<0.2	<0.2	<0.2
Ammoniacal Nitrogen as NH ₄	mg/l	<0.3	<0.3	<0.3
BOD, unfiltered	mg/l	<1	6.29	6.03
Chloride	mg/l	35.3	30.7	31.1
Chlorine, Total (Residual)	mg/l	0.06	0.04	-
COD, unfiltered	mg/l	15.3	36.2	34.8
Conductivity @ 20 deg.C	mS/cm	0.491	0.641	0.643
Nitrate as NO ₃	mg/l	1.11	4.49	4.91
pH	pH Units	7.51	7.36	7.46
Sulphate	mg/l	112	187	194
Total Oxidised Nitrogen as N	mg/l	0.274	1.04	1.14
Filtered (Dissolved) Metals				
Iron (Dis.Filt)	mg/l	0.034	0.509	0.318
Magnesium (Dis.Filt)	mg/l	12.1	32.1	31.6
Potassium (Dis.Filt)	mg/l	6.96	7.68	7.48
Sodium (Dis.Filt)	mg/l	20.7	16.8	16.7
Unfiltered (Total) Metals				
Calcium (Tot. Unfilt.)	mg/l	68.1	85.4	85.5

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