Dewsbury & District Hospital

Gas Monitoring Summary Report (August 2023)

Prepared for Darwin Group Ltd

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Contents

1 Introduction 3
2 Site Summary 3
2.1 Site Location and Description 3
2.2 Findings of the Ground Investigation 4
3 Gas Monitoring 4
3.1 Proposed Gas Monitoring Program 4
3.2 Results Summary 5
3.3 Interpretation of Results 6
3.4 Summary 7
4 Conclusions 11

Tables

Table 3.2-1: Summary of Recorded Gas Levels 5
Table 3.4-1: Gas Protection Score by CS and Type of Building 7
Table 3.4-2: Gas Protection Scores for the Structural Barrier 8
Table 3.4-3: Gas Protection Scores for Ventilation Protection Measures 9
Table 3.4-4: Gas Protection Scores for Gas Resistant Membrane 10

Figures

Figure 2.1-1: Site Location Plan 3
Figure 2.1-2: Site Boundary 4

Appendices

Appendix 1: Gas Monitoring Results

1 Introduction

Key GeoSolutions Ltd (KGS) has been commissioned by Darwin Group to undertake gas monitoring at Dewsbury and District Hospital in West Yorkshire in order to ascertain the levels of ground gases and their flow rates in relation to the construction of a new hospital building.

2 Site Summary

2.1 Site Location and Description

The Site is located at Dewsbury and District Hospital, which is managed by the Mid Yorkshire Hospitals NHS Foundation Trust. The Site of the new building is located at National Grid Reference 423224mE, 422777mN adjacent to the existing Boothroyd Clinical Centre and is shown on Figure 2.1-1. The postcode for the Site is WF13 4HS. The Site currently contains a car park and is bordered by soft landscaping. The approximate site boundary is shown in Figure 2.1-2.

Figure 2.1-1: Site Location Plan

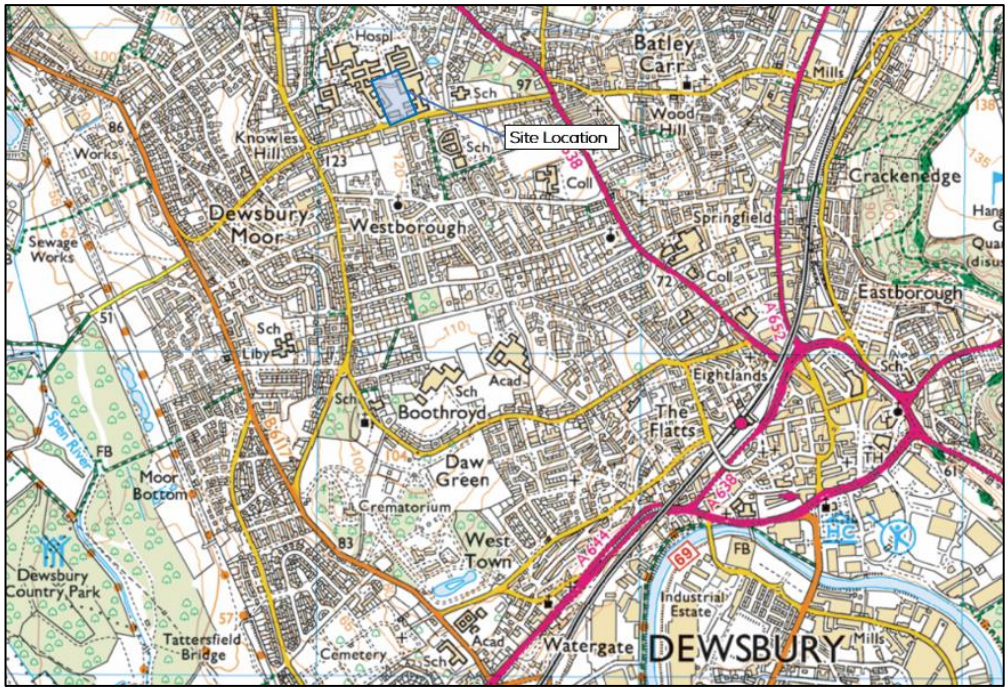
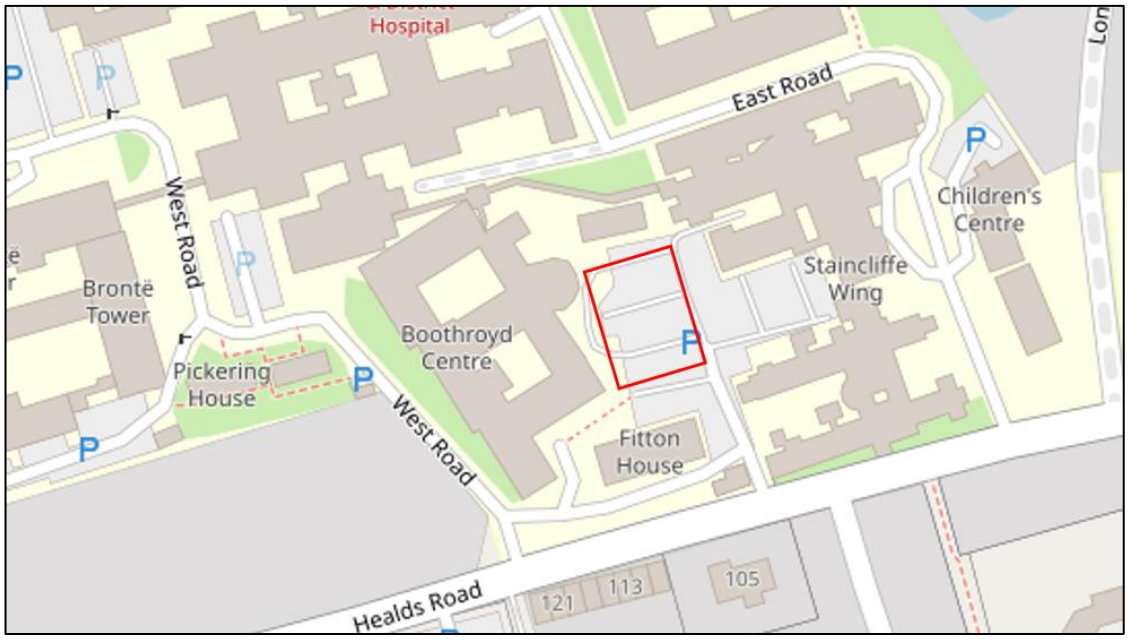


Figure 2.1-2: Site Boundary



2.2 Findings of the Ground Investigation

A ground investigation for the proposed development was undertaken by KGS in April 2023 (report reference 9202-001-R-01-1 “Phase 1 Desk Study & Phase 2 Report on Ground Investigation”), identified that there was a low risk of ground gas associated with deeper areas of Made Ground at the Site, but also that there was a risk of ground gas associated with the coal seams and potential deeper mine workings of the area, especially as the Site is adjacent to a larger fault system which could act as a pathway for mine gas from any deeper seams/workings. This has the potential to affect the end users, maintenance workers, construction workers and the building’s structure.

During the ground investigation six gas monitoring wells were installed within each of the window sample holes. It was recommended that further investigation of the ground gas regime by monitoring of the gas standpipes be undertaken.

The UK Radon Map (https://www.ukradon.org/information/ukmaps) states that some addresses at this location are in bands of elevated radon potential and the maximum radon potential is 5-10%. Radon has the potential to collect in confined spaces and become a long-term health risk for site users and maintenance workers. The UK Radon Government website recommends that for sites in the 5-10% risk band that basic radon protective measures are implemented.

3 Gas Monitoring

3.1 Proposed Gas Monitoring Program

At the time of the report, it was assumed that the building was to contain in-patient wards, where patients would be resident for long periods of time; based on CIRIA C665, 2007, such a building was taken to be

a development with a moderate sensitivity, which, with the assumed moderate generation potential of the source, would require a minimum of nine sets of gas monitoring undertaken over the course of six months.

However, it has since been established that the building is to contain four day-patient theatres with patients not resident for long period of time; such a building is now taken to be a development with a low sensitivity, which, with the assumed moderate generation potential of the source, would require a minimum of six sets of gas monitoring undertaken over the course of three months.

3.2 Results Summary

Six sets of gas monitoring were undertaken at all six monitoring points on Site between 26th April 2023 and 23rd August 2023, and at a range of atmospheric pressures, including two sets at less than 1000mbar, the results of which are included in Appendix 1.

Each gas monitoring reading recorded the peak and steady-state percentages of methane, carbon dioxide and oxygen, the parts per million of hydrogen sulphide and carbon monoxide, as well as the balance of gas in air, borehole pressure, flow rate, and atmospheric pressure.

The levels of gases recorded are summarised in Table 3.2-1 below:

Table 3.2-1: Summary of Recorded Gas Levels

Values	Methane GIA% Peak (Steady)	Carbon Dioxide GIA% Peak (Steady)	Oxygen GIA% Peak (Steady)	Hydrogen Sulphide ppm	Carbon Monoxide ppm	Balance of gas GIA%	Borehole Pressure Pa	Flow Rate L/h	Atmospheric Pressure mbar
Max	0 (0)	9.3 (9.0)	20.9 (20.9)	0	0	81.5	7	0.6	1010
Min	0 (0)	0 (0)	12.9 (12.9)	0	0	75.7	-1	-0.1	990

GIA – Gas In Air Volume

The results showed that levels exceeding the nationally agreed trigger values for carbon dioxide were recorded eleven times over the duration of the monitoring period; these occurred at monitoring points WS03, WS05 and WS06, with the highest values (9.3% peak, 9.0% steady state) recorded in WS05.

3.3 Interpretation of Results

An interpretation of the results has been carried out following the guidance in BS 8485:2015+A1:2019 (Code of Practice for the Design of Protective Measures for Methane and Carbon Dioxide Ground Gases for New Buildings).

3.3.1 Initial Review

Based on the recorded concentrations of ground gas alone, the concentrations of carbon dioxide (>5%) would class the Site as CS2 (low hazard potential)[1].

Methane was not detected during the monitoring.

3.3.2 Calculation of Hazardous Flow Rate

The results of the gas monitoring were used to calculate the Hazardous Gas Flow Rate (Q_{hg}); this is based on:

- Measured ground gas concentrations, C_{gh}, expressed as percentage-by-volume of each ground gas being considered (methane and carbon dioxide); and
- Measured borehole flow rate; volume of total gas flow being emitted from the monitoring point, q, in litres per hour (L/h).

$$Q_{hg} = q\left(\frac{C_{hg}}{100}\right)$$

The results show the worst-case measured ground gas concentration to be 9.3% for carbon dioxide (with no methane detected in any boreholes).

BS 8485 notes that if gas borehole flow is not detected, it should be assumed that it is at the detection limit of the equipment used for the purposed of this calculation; the equipment used was a Gas Data Ltd GFM 436 Serial No 12873 (Calibration due on 28.09.23), for which the typical accuracy is 0.5-3 L/h.

The maximum flow rates detected on site range from 0.0 L/h to 0.6 L/h; the minimum flow rate for the site will therefore be assumed to be 3.0 L/h.

$$Q_{hg}CO_2 = 3.0 \times \left(\frac{9.3}{100}\right)$$

$$= 0.279$$

[1] Based on Table 2 in section 6.4 of BS 8485:2015+A1:2019. CS by site characteristic GSV.

In the worst-case situation, the Hazardous Gas Flow Rate (Q_{hg}) shows approximately 0.28 L/h of carbon dioxide is being emitted.

3.3.3 Site Characterisation

To allow the site to be characterised based on the gas monitoring results, a Gas Screening Value (GSV) needs to be established; based on the assumed proximity of the potential source and the monitoring points to the proposed building, the GSV is taken as Q_{hg} for the site, 0.28 L/h.

This value of GSV was compared to the values in Table 2 in Section 6.4 of BS 8485:2015+A1:2019. (CS by site characteristic GSV), which gives the Characteristic Situation (CS) of the Site as CS2 (low hazard potential). This is the same as the results of the initial review of the gas concentration in Section 3.3.1 above.

3.4 Summary

Based on the results of the gas monitoring, the Site should be characterised as CS2, and requires appropriate gas protection measures.

Section 7 of BS 8485:2015+A1:2019 should be referred to when designing appropriate gas protection measures, which gives advice on building types, gas protection scores, and selection of appropriate protection measures.

The building type is likely to be either Type B or Type C, as shown in Table 3.4-1[2] below, the Minimum Gas Protection Scores (Points) would be 3.5 or 2.5, respectively.

Table 3.4-1: Gas Protection Score by CS and Type of Building

CS	Minimum gas protection score (points)			
	High risk		Medium risk	Low risk
	Type A building	Type B building	Type C building	Type D building
1	0	0	0	0
2	3.5	3.5	2.5	1.5
3	4.5	4	3	2.5
4	6.5 A)	5.5 A)	4.5	3.5
5	— B)	[A1] 6 〈A1〉 A)	5.5	4.5
6	— B)	— B)	[A1] — B) 〈A1〉	[A1] 6 〈A1〉

A) Residential buildings should not be built on CS4 or higher sites unless the type of construction or site circumstances allow additional levels of protection to be incorporated, e.g. high-performance ventilation or pathway intervention measures, and an associated sustainable system of management of maintenance of the gas control system, e.g. in institutional and/or fully serviced contractual situations.

B) The gas hazard is too high for this empirical method to be used to define the gas protection measures.

[2] Table 4 from Section 7.1 of BS 8485:2015+A1:2019.

To achieve the required Minimum Gas Protection Scores (Points), a combination of gas protection measures will need to be selected from Section 7.2 of BS 8485:2015+A1:2019.

Table 5 from BS 8485 gives options for Structural Barriers, floor slabs and basements. This information is shown here as Table 3.4-2 below.

Table 3.4-2: Gas Protection Scores for the Structural Barrier[3]

Floor and substructure design (see Annex A)	Score [A)]
Precast suspended segmental subfloor (i.e. beam and block)	0
Cast in situ ground-bearing floor slab (with only nominal mesh reinforcement)	0.5
Cast in situ monolithic reinforced ground bearing raft or reinforced cast in situ suspended floor slab with minimal penetrations	1 or 1.5 [B)]
Basement floor and walls conforming to BS 8102:2009, Grade 2 waterproofing [C)] [A1] [D)] 〈A1〉	2
Basement floor and walls conforming to BS 8102:2009, Grade 3 waterproofing [C)] [A1] [D)] 〈A1〉	2.5

A) The scores are conditional on breaches of floor slabs, etc., being effectively sealed.

B) To achieve a score of 1.5 the raft or suspended slab should be well reinforced to control cracking and have minimal penetrations cast in (see **A.2.2.2**).

C) The score is conditional on the waterproofing [A1] being provided by a suitable structural barrier with the design and detailing of the walls and floor meeting the requirements for Type B protection. The score cannot be assigned for Type A (waterproof membrane) or Type C (drained cavity wall). 〈A1〉

D) [A1] If a membrane is installed beneath and around the basement to provide Type A waterproofing (BS 8102:2009), it can be assigned a gas protection score in accordance with Table 7, if it meets all the criteria for a gas resistant membrane in that table. 〈A1〉

Table 6 from BS 8485 gives options for Ventilation Measures, pressure relief pathways, passive dispersal layers, active dispersal layers, active positive pressurisation, and ventilated basement substructures. This information is shown here as Table 3.4-3 below.

[3] Table 5 from Section 7.2 of BS 8485:2015+A1:2019.

Table 3.4-3: Gas Protection Scores for Ventilation Protection Measures[4]

Protection element/system	Score	Comments
(a) Pressure relief pathway (usually formed of low fines gravel or with a thin geocomposite blanket or strips terminating in a gravel trench external to the building)	0.5	Whenever possible a pressure relief pathway (as a minimum) should be installed in all gas protection measures systems. If the layer has a low permeability and/ or is not terminated in a venting trench (or similar), then the score is zero.
(b) Passive sub floor dispersal layer: Very good performance: Good performance: Media used to provide the dispersal layer are: • Clear void • Polystyrene void former blanket • Geocomposite void former blanket • No-fines gravel layer with gas drains • No-fines gravel layer	2.5 1.5	Performance criteria for methane and carbon dioxide are shown in Figure B.6 and Figure B.7, respectively. The ventilation effectiveness of different media depends on a number of different factors including the transmissivity of the medium, the width of the building, the side ventilation spacing and type and the thickness of the layer. The selected score should be assigned taking into account the recommendations in Annex B. Passive ventilation should be designed to meet at least "good performance", see Annex B.
(c) Active dispersal layer, usually comprising fans with active abstraction (suction) from a subfloor dilution layer, with roof level vents. The dilution layer may comprise a clear void or be formed of geocomposite or polystyrene void formers	1.5 to 2.5	This system relies on continued serviceability of the pumps, therefore alarm and response systems should be in place. There should be robust management systems in place to ensure the continued maintenance of the system, including pumps and vents. Active ventilation should always be designed to meet at least "good performance", as described in Annex B.
(d) Active positive pressurization by the creation of a blanket of external fresh air beneath the building floor slab by pumps supplying air to points across the central footprint of the building into a permeable layer, usually formed of a thin geocomposite blanket	1.5 to 2.5	This system relies on continued operation of the pumps, therefore alarm and response systems should be in place. The score assigned should be based on the efficient "coverage" of the building footprint and the redundancy of the system. Active ventilation should always be designed to meet at least "good performance".
(e) Ventilated car park (floor slab of occupied part of the building under consideration is underlain by a basement or undercroft car park)	4	Assumes that the car park is vented to deal with car exhaust fumes, designed to *Buildings Regulations 2000, Approved Document F* [9].

[4] Table 6 from Section 7.2 of BS 8485:2015+A1:2019.

Table 7 from BS 8485 gives options for Gas Resistant Membranes. This information is shown here as Table 3.4-4 below.

Table 3.4-4: Gas Protection Scores for Gas Resistant Membrane[5]

Protection element/system	Score	Comments
Gas resistant membrane meeting all of the following criteria: • sufficiently impervious 〈A1〉 , both in the sheet material A) and in the sealing of sheets and sealing around sheet penetrations, to prevent any significant passage of methane and/or carbon dioxide through the membrane; 〈A1〉 • sufficiently durable to remain serviceable for the anticipated life of the building and duration of gas emissions; • 〈A1〉 *Text deleted* 〈A1〉 • sufficiently strong 〈A1〉 B) 〈A1〉 to withstand the installation process and following trades until covered (e.g. penetration from steel fibres in fibre reinforced concrete, penetration of reinforcement ties, tearing due to working above it, dropping tools, etc); 〈A1〉 and to withstand in-service stresses (e.g. settlement if placed below a floor slab); 〈A1〉 • capable, after installation, of providing a complete barrier to the entry of the relevant gas; and • verified in accordance with CIRIA C735 [N1].	2	The performance of membranes is heavily dependent on the quality and design of the installation, resistance to damage after installation and integrity of joints. 〈A1〉 *Text deleted* 〈A1〉 If a membrane is installed that does not meet all the criteria in column 1 then the score is zero.

A) 〈A1〉 A membrane with a methane gas transmission rate <40.0 ml/day/m²/atm (average) for sheets and joints (tested in accordance with BS ISO 15105-1:2007 manometric method) is regarded as sufficiently impervious.

B) For example, reinforced LDPE (virgin polymer) membranes having a minimum mass per unit area of 370 g/m² and not significantly less than 0.4 mm thickness between the reinforcement scrim (tested in accordance with Procedure D (2 mm diameter tip) of BS EN ISO 9863-1:2016) installed above floor slabs are considered sufficiently strong to meet the performance criteria (see also **C.3**). Thicker and more robust membranes or an additional membrane protection layer should be installed directly beneath cast-in-situ floor slabs. 〈A1〉

In addition to these tables, BS8485 provides further information on the options and selection process and should be referred to when selecting gas protection measures.

[5] Table 7 from Section 7.2 of BS 8485:2015+A1:2019.

4 Conclusions

Based on the gas monitoring results, the location of the proposed building at Dewsbury & District Hospital is characterised as CS2.

The proposed building should be designed with appropriate gas protection measures.

It was also noted that some addresses at this location are in bands of elevated radon potential and the maximum radon potential is 5-10%. The UK Radon Government website recommends that for sites in the 5-10% risk band that basic radon protective measures are implemented.

Appendix 1: Gas Monitoring Results

Visit 1

Site name:		Dewsbury Hospital,Dewsbury		Weather Conditions:	Dry;Light wind		Instrument Used	Gas Data Ltd GFM 436 Serial No 12873 Calibration due on 28.09.23								
Date:		26 April 2023		Ground Conditions:	Dry		Detection Limit	3								
Time:		0611-0651 hours		Atmospheric Pressure:	1008mbars Steady pressure		Notes:	Initial Visit								
				Temperature:	3°C											
	Time	Methane	Methane	Carbon Dioxide %	Carbon Dioxide %	Oxygen %	Oxygen %	Hydrogen	Carbon	Balance of gas		Flow Rate (l/hr)	Atm Pressure	Depth to water(m)	Depth of borehole(m)	
		Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Sulphide ppm	Monoxide ppm	GIA%	Borehole Pressure (Pa)		(mbars)			
WS01	6.11	0.0	0.0	0.2	0.2	20.5	20.5	0.0	0.0	79.3	-1	-0.1	1008	1.49	1.96	
WS02	6.25	0.0	0.0	0.0	0.0	20.9	20.9	0.0	0.0	79.1	0	0.0	1008	1.23	1.33	
WS03	6.18	0.0	0.0	1.2	1.1	18.5	18.6	0.0	0.0	80.3	2	0.1	1008	1.58	2.02	
WS04	6.33	0.0	0.0	0.6	0.6	20.4	20.4	0.0	0.0	79.0	0	0.0	1008	1.45	2.97	
*WS05	6.40	0.0	0.0	3.6	3.4	18.4	18.5	0.0	0.0	78.0	-1	-0.1	1008	1.65	2.03	
WS06	6.51	0.0	0.0	1.0	1.0	17.6	17.6	0.0	0.0	81.4	0	0.0	1008	1.91	2.04	

Visit 2

Site name:		Dewsbury Hospital,Dewsbury		Weather Conditions:	Dry;Light wind		Instrument Used	Gas Data Ltd GFM 436 Serial No 12873 Calibration due on 28.09.23								
Date:		12 July 2023		Ground Conditions:	Dry		Detection Limit	3								
Time:		0442-0531 hours		Atmospheric Pressure:	997mbars Steady pressure		Notes:	-								
				Temperature:	14°C											
	Time	Methane	Methane	Carbon Dioxide %	Carbon Dioxide %	Oxygen %	Oxygen %	Hydrogen	Carbon	Balance of gas		Flow Rate (l/hr)	Atm Pressure	Depth to water(m)	Depth of borehole(m)	
		Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Sulphide ppm	Monoxide ppm	GIA%	Borehole Pressure (Pa)		(mbars)			
WS01	4.42	0.0	0.0	0.5	0.5	19.4	19.4	0.0	0.0	80.1	0	0.0	997	1.8	1.96	
WS02	4.51	0.0	0.0	0.0	0.0	20.9	20.9	0.0	0.0	79.1	0	0.0	997	1.26	1.33	
*WS03	5.01	0.0	0.0	7.9	7.8	12.9	12.9	0.0	0.0	79.2	1	0.1	997	1.7	2.02	
WS04	5.12	0.0	0.0	0.6	0.6	18.4	18.4	0.0	0.0	81.0	0	0.0	997	1.58	2.97	
*WS05	5.20	0.0	0.0	9.1	8.8	15.2	15.3	0.0	0.0	75.7	6	0.6	997	1.81	2.03	
*WS06	5.31	0.0	0.0	3.5	3.5	15.0	15.0	0.0	0.0	81.5	3	0.1	997	1.94	2.04	

Visit 3

Site name:		Dewsbury Hospital,Dewsbury		Weather Conditions:	Rain;Light wind		Instrument Used	Gas Data Ltd GFM 436 Serial No 12873 Calibration due on 28.09.23								
Date:		19 July 2023		Ground Conditions:	Wet		Detection Limit	3								
Time:		0440-0530 hours		Atmospheric Pressure:	1005mbars Steady pressure		Notes:	-								
				Temperature:	12°C											
	Time	Methane	Methane	Carbon Dioxide %	Carbon Dioxide %	Oxygen %	Oxygen %	Hydrogen	Carbon	Balance of gas		Flow Rate (l/hr)	Atm Pressure	Depth to water(m)	Depth of borehole(m)	
		Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Sulphide ppm	Monoxide ppm	GIA%	Borehole Pressure (Pa)		(mbars)			
WS01	4.4	0.0	0.0	0.0	0.0	20.9	20.9	0.0	0.0	79.1	0	0.0	1005	1.54	1.96	
WS02	4.51	0.0	0.0	0.0	0.0	20.9	20.9	0.0	0.0	79.1	0	0.0	1005	1.25	1.29	
*WS03	5	0.0	0.0	5.3	5.2	15.5	15.5	0.0	0.0	79.2	3	0.3	1005	1.76	2.02	
WS04	5.09	0.0	0.0	0.5	0.5	20.2	20.2	0.0	0.0	79.3	0	0.0	1005	1.45	2.97	
*WS05	5.20	0.0	0.0	9.3	9.0	14.9	15.0	0.0	0.0	75.8	7	0.6	1005	1.66	2.03	
*WS06	5.3	0.0	0.0	2.3	2.3	17.2	17.2	0.0	0.0	80.5	0	0.0	1005	1.95	2.04	

Visit 4

Site name:		Dewsbury Hospital,Dewsbury		Weather Conditions:	Dry;Light wind		Instrument Used		Gas Data Ltd GFM 436 Serial No 12873 Calibration due on 28.09.23							
Date:		27 July 2023		Ground Conditions:	Wet		Detection Limit		3							
Time:		0541-0625 hours		Atmospheric Pressure:	990mbars Steady pressure		Notes:	-								
				Temperature:	15°C											
	Time	Methane	Methane	Carbon Dioxide %	Carbon Dioxide %	Oxygen %	Oxygen %	Hydrogen	Carbon	Balance of gas		Flow Rate (l/hr)	Atm Pressure	Depth to water(m)	Depth of borehole(m)	
		Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Sulphide ppm	Monoxide ppm	GIA%	Borehole Pressure (Pa)		(mbars)			
WS01	5.41	0.0	0.0	0.3	0.3	20.6	20.6	0.0	0.0	79.1	0	0.0	990	1.23	1.96	
WS02	5.5	0.0	0.0	0.0	0.0	20.9	20.9	0.0	0.0	79.1	0	0.0	990	1.26	1.26	
*WS03	6.02	0.0	0.0	4.4	4.3	16.1	16.1	0.0	0.0	79.5	3	0.3	990	1.41	2.02	
WS04	6.09	0.0	0.0	0.4	0.4	19.4	19.4	0.0	0.0	80.2	0	0.0	990	1.23	2.97	
*WS05	6.17	0.0	0.0	4.3	3.6	17.3	18.2	0.0	0.0	78.4	4	0.5	990	0.98	2.03	
*WS06	6.25	0.0	0.0	3.4	3.4	15.7	15.7	0.0	0.0	80.9	0	0.0	990	1.98	2.04	

Visit 5

Site name:		Dewsbury Hospital,Dewsbury		Weather Conditions:	Dry;Light wind		Instrument Used		Gas Data Ltd GFM 436 Serial No 12873 Calibration due on 28.09.23							
Date:		18 August 2023		Ground Conditions:	Dry		Detection Limit		3							
Time:		1142-1217 hours		Atmospheric Pressure:	1009mbars Pressure falling		Notes:	Ground around monitoring points had been disturbed, with hard cover (concrete/asphalt?) removed.								
				Temperature:	16°C											
	Time	Methane	Methane	Carbon Dioxide %	Carbon Dioxide %	Oxygen %	Oxygen %	Hydrogen	Carbon	Balance of gas		Flow Rate (l/hr)	Atm Pressure	Depth to water(m)	Depth of borehole(m)	
		Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Sulphide ppm	Monoxide ppm	GIA%	Borehole Pressure (Pa)		(mbars)			
WS01	11.42	0.0	0.0	0.0	0.0	20.9	20.9	0.0	0.0	79.1	0	0.0	1009	1.32	1.86	
WS02	11.49	0.0	0.0	0.6	0.3	20.4	20.6	0.0	0.0	79.0	0	0.0	1009	gas bung stuck in pipe		
WS03	11.56	0.0	0.0	0.9	0.9	20.7	20.7	0.0	0.0	78.4	0	0.0	1009	1.65	1.91	
WS04	12.02	0.0	0.0	0.4	0.4	20.8	20.8	0.0	0.0	78.8	0	0.0	1009	1.39	2.95	
*WS05	12.10	0.0	0.0	1.8	1.6	19.7	20.0	0.0	0.0	78.5	4	0.5	1009	1.95	2.02	
WS06	12.17	0.0	0.0	0.3	0.3	20.7	20.7	0.0	0.0	79.0	0	0.0	1009	1.9	1.9	

Visit 6

Site name:		Dewsbury Hospital,Dewsbury		Weather Conditions:	Dry;Light wind		Instrument Used		Gas Data Ltd GFM 436 Serial No 12873 Calibration due on 28.09.23							
Date:		23 August 2023		Ground Conditions:	Dry		Detection Limit		3							
Time:		1227-1258 hours		Atmospheric Pressure:	1010mbars Pressure steady		Notes:	-								
				Temperature:	22°C											
	Time	Methane	Methane	Carbon Dioxide %	Carbon Dioxide %	Oxygen %	Oxygen %	Hydrogen	Carbon	Balance of gas		Flow Rate (l/hr)	Atm Pressure	Depth to water(m)	Depth of borehole(m)	
		Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Peak GIA%	Steady GIA %	Sulphide ppm	Monoxide ppm	GIA%	Borehole Pressure (Pa)		(mbars)			
WS01	12.27	0.0	0.0	0.1	0.0	20.8	20.9	0.0	0.0	79.1	0	0.0	1010	1.78	1.86	
WS02	12.32	0.0	0.0	0.3	0.3	20.7	20.7	0.0	0.0	79.0	0	0.0	1010	gas bung stuck in pipe		
WS03	12.36	0.0	0.0	0.9	0.8	20.6	20.6	0.0	0.0	78.5	1	0.1	1010	1.55	1.85	
WS04	12.43	0.0	0.0	0.3	0.1	20.8	20.9	0.0	0.0	78.9	0	0.0	1010	1.51	2.95	
WS05	12.50	0.0	0.0	1.2	1.2	20.3	20.3	0.0	0.0	78.5	2	0.1	1010	1.96	2.02	
WS06	12.58	0.0	0.0	0.4	0.4	20.8	20.8	0.0	0.0	78.8	0	0.0	1010	1.86	1.9	