



Ref: G79097

Samuel Caslin / Rob Piggot  
**Taylor Wimpey London**  
BT Brentwood, 1 London Road,  
Brentwood, Essex,  
CM14 4QP

**Ensafe Consultants**  
2 Needwood House  
Lancaster Business Park  
Newborough Rd, Burton on Trent  
DE13 9PD  
**Tel: 01283 57 57 33**

18 May 2022

### **ELMSTEAD RD, WIVENHOE - GROUND GAS ASSESSMENT**

Ensafe Consultants were appointed by Taylor Wimpey London Ltd to prepare a letter report summarising the ground gas records made as part of the ground investigations conducted on the plot of land off Elmstead Road / Richard Avenue in Wivenhoe. These studies were conducted to support the construction of residential dwellings on the southern and central sections of the development area with open amenity areas and a sport pitch to be established on the northern part of the site.

The aim of this letter is to provide an overview of the ground gas concentrations observed across the proposed residential areas of the development and associated ground gas regime for the site. This document also seeks to address the queries raised by the Colchester Borough Council - Environmental Protection officer, forwarded via email on the 29<sup>th</sup> April 2022.

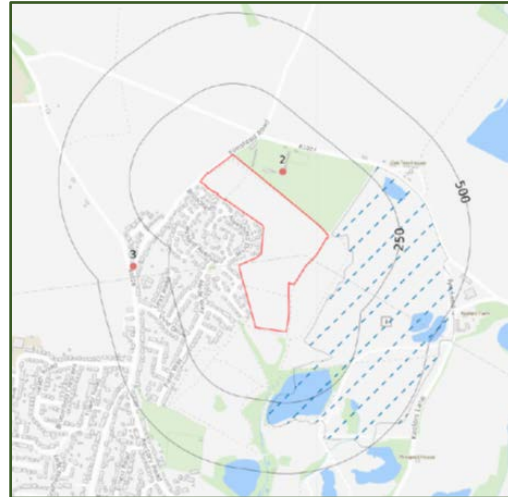
This letter should be read in conjunction with the following documents:

- REC 'Phase I and Phase II Geo-environmental Site Assessment' Land off Richard Avenue, Wivenhoe. Ref 1CO108570/P2/R1. March 2020.
- Ensafe Consultants 'Phase I and Phase II Geo-environmental Site Assessment' Land south of Elmstead Road, Wivenhoe. Ref 1CO108570.002/P2/R0. July 2020.
- Ensafe Consultants 'Phase II Environmental Site Investigation Report' Elmstead Rd, Wivenhoe. Ref. G58346 / Revision 1. February 2022.

Proposed development plans include the construction of dwellings across the southern and central areas of the site, with amenity spaces (including a sport pitch) across the northern section. It is worth noting that no buildings will be erected in the later. A copy of the proposed development plans is included as Figure 1.

## 1.0 Background

Three ground investigations have been conducted on site between July 2019 and October 2021, in which a total of eleven (11No.) monitoring wells were installed across the areas of the site where dwellings will be constructed. The wells were distributed across the plot with the aim to assess the ground gas generation potential of the materials on site across areas. In particular, wells were positioned along the eastern boundary with the specific objective of determining gas migration onto site from the nearby landfill which extends towards the east, as seen in the adjacent plate.



**Plate 1. Extent of development plot and nearby landfill**

No wells were installed in the amenity and sports pitch areas, as no structures are due to be erected and in which ground gas accumulation and inhalation by humans could occur. As these areas are open to the atmosphere, the risk from ground gas inhalation to human health are deemed to be negligible.

Details of the monitoring wells installed on site and their location rationale are summarised in Table 1, below. Plans showing the location of all monitoring wells installed as part of the 3 studies are attached to this letter.

**Table 1. Monitoring well details and location rationale**

Ground investigation	Monitoring Well	Depth of well (m bgl)	Response Zone (m bgl)	Location Rationale
REC (March 2020)	WS103	3.00	1.00-3.00	Located on the southern part of the site, aimed to assess ground gas migration onto site from the nearby landfill (11m NE – 69m S) and determine gas generation on this area.
	WS104	3.00	1.00-3.00	On the south-central part of the site, aimed to determine gas generation on this area.
	WS105	2.00	0.50-1.50	On the central part of the site, slightly east, aimed to determine gas generation on this area.
	WS106	2.00	0.50-1.50	On the southeastern part of the site, closest to the eastern boundary, aimed to assess ground gases migrating onto site from the nearby landfill (11m NE – 69m S) to determine gas generation on this area of the site.

Ensafe (July 2020)	WS302	2.60	0.75-1.75	On the north-central part of the site, northern most location within proposed residential area, aimed to assess ground gases migrating from the north extent of landfill.
	WS304	2.80	0.70-1.40	On the eastern part of the site, along eastern boundary, aimed to target off site migration from landfill to the east.
	WS305	3.00	0.75-2.55	On the central-north part of the site, northern residential area, aimed to determine gas generation on this area.
Ensafe (February 2022)	WS401	2.00	0.70-1.50	On the southern part of the site, aimed to determine gas generation on this area and migration from landfill to the south.
	WS402	1.50	0.50-1.50	On the western part of the site, aimed to determine gas generation on this area.
	WS403	2.70	0.70-1.30	On the eastern-central part of the site, aimed to determine off site migration from landfill to the east.
	WS404	1.30	0.50-1.20	On the northern-eastern part of the site, aimed to determine gas generation on this area and gas migration from landfill to the east.

## 2.0 Ground gas records

To assess the site's potential for ground gas generation, a total of twelve (12No) monitoring visits were conducted between January 2020 and January 2022, as detailed in Table 2. Visits were preferably conducted in periods of low or falling atmospheric pressure to provide a worst-case scenario of gas generation.

**Table 2. Monitoring visits conducted as part of each ground investigation**

Ground investigation	Dates of Monitoring Visits
REC (March 2020)	3 January 2020 10 January 2020 17 January 2020
Ensafe (July 2020)	23 June 2020 30 June 2020 9 July 2020
Ensafe (February 2022)	17 November 2021 1 December 2021 17 December 2021 29 December 2021 13 January 2021 28 January 2022

The gas generation potential of the underlying soils was considered to be 'very low', with the primary source of gases being the landfill to the east. Based on this, the most recent investigation implemented a monitoring programme comprising six (6No.) monitoring visits over 3 months.

During each visit which gas flow rates as well as concentrations of methane, carbon dioxide, oxygen, hydrogen sulphide and carbon monoxide, were recorded, using a GA2000+ S/N 11567 instrument, whilst concentrations of volatile organic compounds were recorded by means of a Photoionisation detector.

Atmospheric pressures recorded on site during the monitoring visits ranged between 998 and 1042mb.

The results from all monitoring rounds are summarised below in Table 3 and the monitoring certificates with details on the observations made during each visit is provided in Appendix 1.

**Table 3. Summary of Ground Gas Monitoring Results**

Exploratory Hole	Max CH <sub>4</sub> (% Vol)	Max CO <sub>2</sub> (% Vol)	Min O <sub>2</sub> (% Vol)	Max Gas Flow (l/hr)	Groundwater level (m)
WS103	<0.1	2.6	16.4	<0.1	0.75-2.55
WS104	<0.1	2.3	15.0	<0.1	2.60-2.84
WS105	<0.1	0.2	19.8	<0.1	0.73-2.43
WS106	<0.1	1.9	12.4	<0.1	0.33-0.57
WS302	0.3	2.0	19.9	0.4	1.76-1.80
WS304	0.3	1.3	20.0	<0.1	1.58-dry
WS305	0.3	0.9	20.1	0.7	1.97-2.29
WS401	<0.1	1.1	18.9	<0.1	Dry
WS402	<0.1	1.4	19.2	0.1	Dry
WS403	<0.1	3.4	19.2	0.1	Dry
WS404	<0.1	1.9	20.1	0.1	Dry

Methane concentrations were generally found below instrumental limits of detection (<0.1%v/v) across all wells and monitoring rounds, apart from rounds carried out on the 23<sup>rd</sup> and 30<sup>th</sup> June 2020, where concentrations of up to 0.3%v/v were noted in wells - WS302, WS304 and WS305.

Carbon dioxide concentrations ranged between 0.2%vol and 3.4%vol, throughout the monitoring period.

Oxygen concentrations ranged between 12.4%vol and 20.1%vol.

Gas flow rates were generally negligible (~ 0.1l/hr) apart from a single visit (23 June 2020) when flow rates of 0.4l/hr and 0.7l/hr were recorded in WS302 and WS305, respectively.

Concentrations of volatile compounds observed on site ranged between 0.02 and 9.9 ppm.

### 3.0 Ground gas assessment

Based on the guidance in BS 8485:2015+A1:2019<sup>1</sup>, a calculation of the hazardous gas flow rate (Q<sub>hg</sub>) has been undertaken by combining the maximum steady flow rate and maximum steady concentrations for each borehole for each monitoring visit. This methodology provides a 'worst case scenario' in order to characterise the highest potential risk to human health from ground gas at the site. The Q<sub>hg</sub> estimate based on the methane and carbon dioxide levels observed on site is detailed below:

$$Q_{hg} \text{ CH}_4 \text{ (WS305)} = 0.7 \times 0.3 / 100 = 0.0021 \text{ l/hr}$$

$$Q_{hg} \text{ CO}_2 \text{ (WS403)} = 0.1 \times 3.4 / 100 = 0.0034 \text{ l/hr}$$

Based on the findings of the site investigation, a worst case Q<sub>hg</sub> of 0.0021l/hr and 0.0034 l/hr were estimated on for the site based on the methane and carbon dioxide concentrations recorded on site. These values suggest a Characteristic Situation 1 (CS1) - 'Very Low Risk' would be an appropriate with regard to new developments, according to BS8485:2015+A1:2019.

Details provided by the client about the proposed development suggest the building type as per Table 3 of the BS 8485:2015+A1:2019 would be 'Type A', as it would comprise a private premises (dwellings) with small to large room sizes.

Based on the assumption that development will have no central building management control and with the information available to date, the gas protection score for the site would be '0', predicated by a 'CS1' designation, combined with building type A and determined using Table 4 of the BS guidance. Therefore, specific gas protection measures are unlikely to be required for the proposed development as there is no evident sign of significant gas generation on site or migration from the landfill to the east.

### 4.0 Conclusions

A total of twelve (12No) ground gas monitoring rounds have been conducted between January 2020 and January 2021, using monitoring wells installed across the proposed residential areas of the site and along the eastern boundary to detect any potential migration of gases from the landfill to the east.

Methane and carbon dioxide concentrations recorded on site were generally low and indicate that a Characteristic Situation 1 (CS1) – 'Very low risk' is adequate for the development, requiring no special protection measures to be installed in the proposed dwellings.

We trust the above and enclosed information provides an accurate summary of the works conducted in terms of ground gas risk on site and answers the queries raised by Colchester Borough Council - Environmental Protection.

Please do not hesitate to contact us if there are any further queries or if you wish to discuss this matter further.

<sup>1</sup> BSI (2019) Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings. BS 8485:2015+A1:2019. Dated: 24<sup>th</sup> January 2019.

**For and on behalf of Ensafe Consultants**



Dr. Melissa Morales  
Geo-Environmental Operations Director (South)  
E: MMorales@ensafe.co.uk

**Enclosed Documents**

Figures

- Fig 1 Proposed Development Plan
- Fig 2 REC Exploratory Hole Location plan (March 2020)
- Fig 3 Ensafe Exploratory Hole Location plan (July 2020)
- Fig 4 Ensafe Exploratory Hole Location Plan (February 2022)

Appendix 1 – Ground gas records

Terms & Conditions

## FIGURES



**KEY:**  
— Red Line Boundary



**Ensafe Consultants**  
 Needwood House  
 Lancaster Park  
 Newborough Road  
 Needwood  
 Burton on Trent  
 DE13 9PD  
 Tel: 01283 575733  
 www.ensafe.co.uk

**PROJECT:**

Land off Elmstead Road  
 Wivenhoe  
 CO7 9JF

**FIGURE TITLE:**

Proposed Site Plan

**NOTES:**

- 1) This drawing is to be read in conjunction with all relevant documentation.
- 2) All surveyed information including levels and layout is provided by Taylor Wimpey TW027-PL03. Jan 2021

**PROJECT No.:**  
 G58346

**SCALE:**  
 Not to Scale







**FIGURE No.:**  
 001

**REVISION:**  
 A



KEY:



-  Site Boundary
-  Window Sample Location
-  Installed Window Sample Location
-  Soakaway Test Location
-  Overhead Power Line
-  Public Footpath

The client must not amend any drawing, design or other intellectual property produced by REC Ltd, without permission in writing from REC Ltd in advance of any amendments being made. In the event that such written permission is not obtained in advance of the amendments being made, REC Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or other intellectual property.



REC Ltd  
Capital Business Centre,  
22 Carlton Road,  
South Croydon, CR2 0BS  
  
t + 44 2034 788076  
recld.co.uk

Job No. & Title:  
Land off Richard  
Avenue, Wivenhoe

Client:  
Taylor Wimpey  
East London







Drawn by:	HWW
Approved by:	RH
Date:	

Notes:  
NOT TO SCALE

Drawing Title:  
Figure 2  
Exploratory Hole  
Location Plan  
(March 2020)

KEY:



-  Site Boundary
-  Window Sample Location
-  Installed Window Sample Location
-  Soakaway Test Location
-  Overhead Power Line
-  Public Footpath

The client must not amend any drawing, design or other intellectual property produced by Ensaf Consultants Ltd, without permission in writing from Ensaf Consultants Ltd in advance of any being made.

In the event that such written permission is not obtained in advance of the amendments being made, Ensaf Consultants Ltd shall not be liable for any damage and/or losses occurring as a result of the amended drawing, design or other intellectual property.



Ensaf Consultants Ltd  
Capital Business Centre,  
22 Carlton Road,  
South Croydon, CR2 0BS

t + 44 2034 788076  
info@ensaf.co.uk

Job No. & Title:

1CO108570  
Land off Richard  
Avenue, Wivenhoe

Client:

Taylor Wimpey  
East London

Drawn by: HWW

Approved by: HF

Date: July 2020



Notes:

NOT TO SCALE

Drawing Title:

Figure 3  
Exploratory Hole  
Location Plan  
(July 2020)

**Key**

- Site Boundary
-  Trial Pit Location
-  WS w/ Installation



**PROJECT:**

Elmstead Road  
Wivenhoe  
CO7 9JF

**FIGURE TITLE:**

Exploratory Hole Location  
Plan  
(February 2022)

**PROJECT No.:**  
G58346

**FIGURE No.:**  
004

**SCALE:**  
Not to Scale

**REVISION:**  
A

**NOTES:**

- 1) This drawing is to be read in conjunction with all relevant documentation.
- 2) All surveyed information including levels and layout is provided by Google Satellite Images, Sep 2021



## APPENDIX 1



**Table 8.11 Summary of Ground Gas Monitoring Results**

Well	Date	Flow (l/hr)		Steady O <sub>2</sub> %v/v	Concentration CH <sub>4</sub>		CH <sub>4</sub> Qhg l/hr	Concentration CO <sub>2</sub>		CO <sub>2</sub> Qhg l/hr	Atmospheric Pressure (mb)/ Dynamic	Response Zone (m bgl)	Depth to Base (m bgl)	Depth to Water (m bgl)
		Peak	Steady		Peak %v/v	Steady %v/v		Peak %v/v	Steady %v/v					
WS103	03/01/2020	<0.1	<0.1	16.4	<0.1	<0.1	<0.0001	2.1	2.1	0.0021	1017 (Steady)	1.00 - 3.00	3.00	2.40
	10/01/2020	<0.1	<0.1	16.6	<0.1	<0.1	<0.0001	2.3	2.3	0.0023	1017 (Falling)		3.00	2.55
	17/01/2020	<0.1	<0.1	16.4	<0.1	<0.1	<0.0001	2.6	2.6	0.0026	1008 (Steady)		3.00	0.75*
WS104	03/01/2020	<0.1	<0.1	15.2	<0.1	<0.1	<0.0001	2.1	2.1	0.0021	1014 (Steady)	1.00 - 3.00	3.00	2.60
	10/01/2020	<0.1	<0.1	15.0	<0.1	<0.1	<0.0001	2.3	2.3	0.0023	1016 (Falling)		3.00	2.84
	17/01/2020	<0.1	<0.1	16.2	<0.1	<0.1	<0.0001	2.1	2.1	0.0021	1010 (Steady)		3.00	2.77
WS105	03/01/2020	<0.1	<0.1	19.9	<0.1	<0.1	<0.0001	0.3	0.2	0.0003	1014 (Steady)	0.50 - 1.50	1.53	0.73
	10/01/2020	<0.1	<0.1	19.8	<0.1	<0.1	<0.0001	0.4	0.2	0.0040	1016 (Falling)		1.50	0.83
	17/01/2020	<0.1	<0.1	20.5	<0.1	<0.1	<0.0001	0.2	0.0	0.0002	1008 (Steady)		1.50	2.43
WS106	03/01/2020	<0.1	<0.1	17.2	<0.1	<0.1	<0.0001	1.3	1.3	0.0013	1015 (Steady)	0.50 - 1.50	1.50	0.50*
	10/01/2020	<0.1	<0.1	12.4	<0.1	<0.1	<0.0001	1.9	1.9	0.0019	1016 (Falling)		1.38	0.57
	17/01/2020	<0.1	<0.1	19.7	<0.1	<0.1	<0.0001	0.7	0.7	0.0007	1008 (Steady)		1.50	0.33*

\* Response zone flooded



**Table 8.11 Summary of Ground Gas Monitoring Results**

Well	Date	Flow (l/hr)		Low O <sub>2</sub> %v/v	Concentration CH <sub>4</sub> %v/v		CH <sub>4</sub> Qhg l/hr	Concentration CO <sub>2</sub> %v/v		CO <sub>2</sub> Qhg l/hr	PID (ppm)	Atmospheric Pressure (mb)/ Dynamic	Response Zone (mbgl)	Depth to Base (mbgl)	Depth to Water (mbgl)	Response Zone Flooded?
		Peak	Steady		Peak	Steady		Peak	Steady							
WS302	23/06/20	3.9	0.4	20.0	<0.3	<0.3	0.0117	2.0	2.0	0.078	4.4	1022 (Falling)	0.75 – 1.75	1.86	1.80	No
	30/06/20	<0.1	<0.1	19.9	<0.3	<0.3	0.0003	1.7	1.7	0.0017	0.5	1001 (Steady)		1.82	1.79	No
	09/07/20	<0.1	<0.1	20.0	<0.1	<0.1	<0.0001	1.9	1.8	0.0019	0.02	1006 (Steady)		1.82	1.76	No
WS304	23/06/20	<0.1	<0.1	20.2	<0.1	<0.1	<0.0001	1.3	1.3	0.0013	9.5	1022 (Falling)	0.70 – 1.40	1.66	Dry	No
	30/06/20	<0.1	<0.1	20.0	<0.3	<0.3	0.0003	1.2	1.2	0.0012	0.6	1001 (Steady)		1.59	1.58	No
	09/07/20	<0.1	<0.1	20.1	<0.1	<0.1	<0.0001	1.3	1.3	0.0013	0.018	1006 (Steady)		1.60	1.59	No
WS305	23/06/20	0.9	0.7	20.6	<0.3	<0.3	0.0027	0.9	0.9	0.0081	9.9	1022 (Falling)	0.75 – 2.55	2.61	1.97	No
	30/06/20	<0.1	<0.1	20.2	<0.3	<0.3	0.0003	0.9	0.8	0.0009	0.7	1001 (Steady)		2.62	2.24	No
	09/07/20	<0.1	<0.1	20.1	<0.1	<0.1	<0.0001	0.9	0.9	0.0009	0.029	1006 (Steady)		2.64	2.29	No

---

**ESS****Environmental Site Sampling Ltd**

---

17<sup>th</sup> November 2021

Mr N Abbas  
Ensafe Consultants  
2 Needwood House  
Newborough Road  
Needwood  
Burton -On-Trent  
DE13 9PD

**Environmental Site Sampling Ltd**  
**94 Dillotford Avenue**  
**Styvechale**  
**Coventry**  
**CV3 5DU**

**Tel/Fax: (024) 7669 0514**

**Mobile : 07971 664 118**

e.mail: [cosgrove\\_patrick@hotmail.com](mailto:cosgrove_patrick@hotmail.com)

**Page 1 of 2**

### **In-situ Analysis Report: ENS/6088**

Dear Mr Abbas,

Please find enclosed a copy of the in-situ ground gas monitoring results undertaken at Land off Elmstead Road, Wivenhoe, CO7 9JF, on 17<sup>th</sup> November 2021.

I trust you find these satisfactory. Should you have any queries please contact us.

Yours Sincerely,

Patrick Cosgrove

P V Cosgrove BSc MSc  
Environmental Site Sampling Ltd



**Environmental Site Sampling Ltd Registered in England & Wales No. 4431348**  
**Registered Office: 94 Dillotford Avenue Coventry CV3 5DU**

## In-situ Analysis: ENS/6088

Client: Pam Brown Associates Ltd

Project: 2074-20, Land off Elmstead Road, Wivenhoe, CO7 9JF

17/11/21

Borehole	Gas Flow (l/hr)	Borehole Pressure (mb)	Methane (%vol)		Methane (%LEL)		Carbon Dioxide (%vol)		Oxygen (%vol)		Other Gases (ppm)		Water Level (Meters)
			Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	H <sub>2</sub> S	CO	
WS 401	<0.1	0.05	<0.1	<0.1	<2	<2	1.0	1.0	18.9	18.9	<1	<1	Dry 1.50m
WS 402	<0.1	0.07	<0.1	<0.1	<2	<2	1.3	1.3	18.8	18.8	<1	<1	Dry 1.61m
WS 403	<0.1	0.03	<0.1	<0.1	<2	<2	0.7	0.7	19.2	19.2	<1	<1	Dry 2.14m
WS 404	0.1	0.17	<0.1	<0.1	<2	<2	1.9	1.9	18.2	18.2	<1	<1	Dry 1.41m

**Notes:**  
Monitoring order is from left to right.  
Steady concentrations are measured up to 3 minutes.

Additional Information	
Date Monitoring Undertaken:	17 <sup>th</sup> November 2021
Monitoring Undertaken By:	P Cosgrove
Equipment Used:	GA2000+ S/N 11567
Atmospheric Pressure Colchester a.m. (mb):	1023mb
Atmospheric Pressure On-site (mb):	1025mb
Atmospheric Pressure Colchester p.m. (mb):	1028mb
Weather During Visit:	Sunny, Dry, Wind W, 2m/s, 10°C
Comments:	



**ESS**

**Environmental Site Sampling Ltd**

1<sup>st</sup> December 2021

Mr N Abbas  
Ensafe Consultants  
2 Needwood House  
Newborough Road  
Needwood  
Burton -On-Trent  
DE13 9PD

**Environmental Site Sampling Ltd**  
**94 Dillotford Avenue**  
**Styvechale**  
**Coventry**  
**CV3 5DU**

**Tel/Fax: (024) 7669 0514**

**Mobile : 07971 664 118**

e.mail: cosgrove\_patrick@hotmail.com

**Page 1 of 2**

### **In-situ Analysis Report: ENS/6105**

Dear Mr Abbas,

Please find enclosed a copy of the in-situ ground gas monitoring results undertaken at Land off Elmstead Road, Wivenhoe, CO7 9JF, on 1<sup>st</sup> December 2021.

I trust you find these satisfactory. Should you have any queries please contact us.

Yours Sincerely,

Patrick Cosgrove

P V Cosgrove BSc MSc  
Environmental Site Sampling Ltd



**Environmental Site Sampling Ltd Registered in England & Wales No. 4431348**  
**Registered Office: 94 Dillotford Avenue Coventry CV3 5DU**

## In-situ Analysis: ENS/6105

Client: Pam Brown Associates Ltd

Project: 2074-20, Land off Elmstead Road, Wivenhoe, CO7 9JF

01/12/21

Borehole	Gas Flow (l/hr)	Borehole Pressure (mb)	Methane (%vol)		Methane (%LEL)		Carbon Dioxide (%vol)		Oxygen (%vol)		Other Gases (ppm)		Water Level (Meters)
			Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	H <sub>2</sub> S	CO	
WS 401	<0.1	0.03	<0.1	<0.1	<2	<2	1.1	1.1	18.7	18.7	<1	<1	Dry 1.50m
WS 402	<0.1	0.04	<0.1	<0.1	<2	<2	1.4	1.4	19.0	19.0	<1	<1	Dry 1.61m
WS 403	0.1	0.16	<0.1	<0.1	<2	<2	3.1	3.1	16.9	16.9	<1	<1	Dry 2.14m
WS 404	<0.1	0.09	<0.1	<0.1	<2	<2	0.4	0.4	20.1	20.1	<1	<1	Dry 1.41m

**Notes:**  
Monitoring order is from left to right.  
Steady concentrations are measured up to 3 minutes.

Additional Information	
Date Monitoring Undertaken:	1 <sup>st</sup> December 2021
Monitoring Undertaken By:	P Cosgrove
Equipment Used:	GA2000+ S/N 11567
Atmospheric Pressure Colchester a.m. (mb):	0997mb
Atmospheric Pressure On-site (mb):	0998mb
Atmospheric Pressure Colchester p.m. (mb):	0994mb
Weather During Visit:	Sunny, Dry, Wind NW, 4m/s, 7°C
Comments:	

---

**ESS****Environmental Site Sampling Ltd**

---

17<sup>th</sup> December 2021

Mr N Abbas  
Ensafe Consultants  
2 Needwood House  
Newborough Road  
Needwood  
Burton -On-Trent  
DE13 9PD

**Environmental Site Sampling Ltd**  
**94 Dillotford Avenue**  
**Styvechale**  
**Coventry**  
**CV3 5DU**

**Tel/Fax: (024) 7669 0514**

**Mobile : 07971 664 118**

e.mail: cosgrove\_patrick@hotmail.com

**Page 1 of 2**

### **In-situ Analysis Report: ENS/6127**

Dear Mr Abbas,

Please find enclosed a copy of the in-situ ground gas monitoring results undertaken at Land off Elmstead Road, Wivenhoe, CO7 9JF, on 17<sup>th</sup> December 2021.

I trust you find these satisfactory. Should you have any queries please contact us.

Yours Sincerely,

Patrick Cosgrove

P V Cosgrove BSc MSc  
Environmental Site Sampling Ltd



**Environmental Site Sampling Ltd Registered in England & Wales No. 4431348**  
**Registered Office: 94 Dillotford Avenue Coventry CV3 5DU**

## In-situ Analysis: ENS/6126

Client: Pam Brown Associates Ltd

Project: 2074-20, Land off Elmstead Road, Wivenhoe, CO7 9JF

17/12/21

Borehole	Gas Flow (l/hr)	Borehole Pressure (mb)	Methane (%vol)		Methane (%LEL)		Carbon Dioxide (%vol)		Oxygen (%vol)		Other Gases (ppm)		Water Level (Meters)
			Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	H <sub>2</sub> S	CO	
WS 401	<0.1	0.02	<0.1	<0.1	<2	<2	0.9	0.9	19.1	19.1	<1	<1	Dry 1.50m
WS 402	0.1	0.14	<0.1	<0.1	<2	<2	1.3	1.3	18.6	18.6	<1	<1	Dry 1.61m
WS 403	<0.1	0.06	<0.1	<0.1	<2	<2	2.6	2.6	17.2	17.2	<1	<1	Dry 2.14m
WS 404	<0.1	0.05	<0.1	<0.1	<2	<2	0.5	0.5	19.8	19.8	<1	<1	Dry 1.41m

**Notes:**  
Monitoring order is from left to right.  
Steady concentrations are measured up to 3 minutes.

Additional Information	
Date Monitoring Undertaken:	17 <sup>th</sup> December 2021
Monitoring Undertaken By:	P Cosgrove
Equipment Used:	GA2000+ S/N 11567
Atmospheric Pressure Colchester a.m. (mb):	1042mb
Atmospheric Pressure On-site (mb):	1042mb
Atmospheric Pressure Colchester p.m. (mb):	1040mb
Weather During Visit:	Overcast, Dry, Wind E, 3m/s, 6°C
Comments:	

---

**ESS****Environmental Site Sampling Ltd**

---

29<sup>th</sup> December 2021

Mr N Abbas  
Ensafe Consultants  
2 Needwood House  
Newborough Road  
Needwood  
Burton -On-Trent  
DE13 9PD

**Environmental Site Sampling Ltd**  
**94 Dillotford Avenue**  
**Styvechale**  
**Coventry**  
**CV3 5DU**

**Tel/Fax: (024) 7669 0514**

**Mobile : 07971 664 118**

e.mail: [cosgrove\\_patrick@hotmail.com](mailto:cosgrove_patrick@hotmail.com)

**Page 1 of 2**

### **In-situ Analysis Report: ENS/6136**

Dear Mr Abbas,

Please find enclosed a copy of the in-situ ground gas monitoring results undertaken at Land off Elmstead Road, Wivenhoe, CO7 9JF, on 29<sup>th</sup> December 2021.

I trust you find these satisfactory. Should you have any queries please contact us.

Yours Sincerely,

Patrick Cosgrove

P V Cosgrove BSc MSc  
Environmental Site Sampling Ltd



**Environmental Site Sampling Ltd Registered in England & Wales No. 4431348**  
**Registered Office: 94 Dillotford Avenue Coventry CV3 5DU**

## In-situ Analysis: ENS/6136

Client: Pam Brown Associates Ltd

Project: 2074-20, Land off Elmstead Road, Wivenhoe, CO7 9JF

29/12/21

Borehole	Gas Flow (l/hr)	Borehole Pressure (mb)	Methane (%vol)		Methane (%LEL)		Carbon Dioxide (%vol)		Oxygen (%vol)		Other Gases (ppm)		Water Level (Meters)
			Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	H <sub>2</sub> S	CO	
WS 401	<0.1	0.06	<0.1	<0.1	<2	<2	1.1	1.1	18.7	18.7	<1	<1	Dry 1.50m
WS 402	<0.1	0.03	<0.1	<0.1	<2	<2	1.3	1.3	18.9	18.9	<1	<1	Dry 1.61m
WS 403	<0.1	0.06	<0.1	<0.1	<2	<2	3.4	3.4	16.9	16.9	<1	<1	Dry 2.14m
WS 404	0.1	0.12	<0.1	<0.1	<2	<2	0.9	0.9	19.4	19.4	<1	<1	Dry 1.41m

**Notes:**  
Monitoring order is from left to right.  
Steady concentrations are measured up to 3 minutes.

Additional Information	
Date Monitoring Undertaken:	29 <sup>th</sup> December 2021
Monitoring Undertaken By:	P Cosgrove
Equipment Used:	GA2000+ S/N 11567
Atmospheric Pressure Colchester a.m. (mb):	0997mb
Atmospheric Pressure On-site (mb):	0998mb
Atmospheric Pressure Colchester p.m. (mb):	1001mb
Weather During Visit:	Overcast, Raining, Wind SW, 4m/s, 8°C
Comments:	

---

**ESS****Environmental Site Sampling Ltd**

---

13<sup>th</sup> January 2022

Mr N Abbas  
Ensafe Consultants  
2 Needwood House  
Newborough Road  
Needwood  
Burton -On-Trent  
DE13 9PD

**Environmental Site Sampling Ltd**  
**94 Dillotford Avenue**  
**Styvechale**  
**Coventry**  
**CV3 5DU**

**Tel/Fax: (024) 7669 0514**

**Mobile : 07971 664 118**

e.mail: cosgrove\_patrick@hotmail.com

**Page 1 of 2**

### **In-situ Analysis Report: ENS/6141**

Dear Mr Abbas,

Please find enclosed a copy of the in-situ ground gas monitoring results undertaken at Land off Elmstead Road, Wivenhoe, CO7 9JF, on 13<sup>th</sup> January 2022.

I trust you find these satisfactory. Should you have any queries please contact us.

Yours Sincerely,

Patrick Cosgrove

P V Cosgrove BSc MSc  
Environmental Site Sampling Ltd



**Environmental Site Sampling Ltd Registered in England & Wales No. 4431348**  
**Registered Office: 94 Dillotford Avenue Coventry CV3 5DU**

## In-situ Analysis: ENS/6141

Client: Ensafe Consultants

Project: 2074-20, Land off Elmstead Road, Wivenhoe, CO7 9JF

13/01/22

Borehole	Gas Flow (l/hr)	Borehole Pressure (mb)	Methane (%vol)		Methane (%LEL)		Carbon Dioxide (%vol)		Oxygen (%vol)		Other Gases (ppm)		Water Level (Meters)
			Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	H <sub>2</sub> S	CO	
WS 401	<0.1	0.03	<0.1	<0.1	<2	<2	0.8	0.8	18.9	18.9	<1	<1	Dry 1.50m
WS 402	0.1	0.12	<0.1	<0.1	<2	<2	1.0	1.0	19.2	19.2	<1	<1	Dry 1.61m
WS 403	<0.1	0.04	<0.1	<0.1	<2	<2	2.6	2.6	17.6	17.6	<1	<1	Dry 2.14m
WS 404	<0.1	0.02	<0.1	<0.1	<2	<2	0.9	0.9	19.1	19.1	<1	<1	Dry 1.41m

**Notes:**  
Monitoring order is from left to right.  
Steady concentrations are measured up to 3 minutes.

Additional Information	
Date Monitoring Undertaken:	13 <sup>th</sup> January 2022
Monitoring Undertaken By:	P Cosgrove
Equipment Used:	GA2000+ S/N 11567
Atmospheric Pressure Colchester a.m. (mb):	1041mb
Atmospheric Pressure On-site (mb):	1041mb
Atmospheric Pressure Colchester p.m. (mb):	1039mb
Weather During Visit:	Sunny, Dry, Wind SW, 1m/s, 4°C
Comments:	



---

**ESS****Environmental Site Sampling Ltd**

---

28<sup>th</sup> January 2022

Mr N Abbas  
Ensafe Consultants  
2 Needwood House  
Newborough Road  
Needwood  
Burton -On-Trent  
DE13 9PD

**Environmental Site Sampling Ltd**  
**94 Dillotford Avenue**  
**Styvechale**  
**Coventry**  
**CV3 5DU**

**Tel/Fax: (024) 7669 0514**

**Mobile : 07971 664 118**

e.mail: [cosgrove\\_patrick@hotmail.com](mailto:cosgrove_patrick@hotmail.com)

**Page 1 of 2**

### **In-situ Analysis Report: ENS/6154**

Dear Mr Abbas,

Please find enclosed a copy of the in-situ ground gas monitoring results undertaken at Land off Elmstead Road, Wivenhoe, CO7 9JF, on 28<sup>th</sup> January 2022.

I trust you find these satisfactory. Should you have any queries please contact us.

Yours Sincerely,

Patrick Cosgrove

P V Cosgrove BSc MSc  
Environmental Site Sampling Ltd



**Environmental Site Sampling Ltd Registered in England & Wales No. 4431348**  
**Registered Office: 94 Dillotford Avenue Coventry CV3 5DU**

## In-situ Analysis: ENS/6154

Client: Ensafe Consultants

Project: 2074-20, Land off Elmstead Road, Wivenhoe, CO7 9JF

28/01/22

Borehole	Gas Flow (l/hr)	Borehole Pressure (mb)	Methane (%vol)		Methane (%LEL)		Carbon Dioxide (%vol)		Oxygen (%vol)		Other Gases (ppm)		Water Level (Meters)
			Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	H <sub>2</sub> S	CO	
WS 401	<0.1	0.07	<0.1	<0.1	<2	<2	1.3	1.3	18.3	18.3	<1	<1	Dry 1.50m
WS 402	0.1	0.14	<0.1	<0.1	<2	<2	1.4	1.4	19.2	19.2	<1	<1	Dry 1.61m
WS 403	<0.1	0.04	<0.1	<0.1	<2	<2	3.2	3.2	17.5	17.5	<1	<1	Dry 2.14m
WS 404	<0.1	0.07	<0.1	<0.1	<2	<2	0.9	0.9	19.7	19.7	<1	<1	Dry 1.41m

**Notes:**  
Monitoring order is from left to right.  
Steady concentrations are measured up to 3 minutes.

Additional Information	
Date Monitoring Undertaken:	28 <sup>th</sup> January 2022
Monitoring Undertaken By:	P Cosgrove
Equipment Used:	GA2000+ S/N 11567
Atmospheric Pressure Colchester a.m. (mb):	1036mb
Atmospheric Pressure On-site (mb):	1035mb
Atmospheric Pressure Colchester p.m. (mb):	1032mb
Weather During Visit:	Sunny, Dry, Wind SW, 2m/s, 5°C
Comments:	