

Our Ref: ADB/16124/GasLet

Your Ref:

Contact: Alan Beattie

21st May 2021

Mr Neville Staines
 1 Glyn Road
 Lower Brynaman
 Ammanford
 SA18 1SS

For the attn. of Mr Neville Staines

Dear Sir,

GAS MONITORING: GLYN ROAD, LOWER BRYNAMAN**1.0 Gas Monitoring Results**

We confirm that the full six rounds of in-situ gas monitoring visits have now been completed. The results are enclosed and we report the following:

An The Intrusive Mining Risk Assessment was undertaken on 9th and 15th February 2021 and comprised the drilling of four rotary probe holes. The rotary boreholes, 105mm in diameter, were sunk using a Fraste XL rotary drilling rig by Apex Drilling Services Limited. The probeholes were terminated at a depth of 35.00m below the current ground level.

The proposed locations of the exploratory holes were determined by Terra Firma (Wales) Limited with reference to the proposed site layout. Two gas monitoring installations were installed in BH02 and BH03 the details of the wells can be seen on the borehole logs present in **Annex A** and have been summarise below in **Table 1.0**.

Table 1.0 Well Installations			
Borehole	Installation Depth (m)	Pipework Description	Backfill Description
BH02	4.00	Plain Pipe = GL to 1.00m Slotted Pipe = 1.00 to 4.00m	Concrete and Top Hat Cover Bentonite Seal = 0.50 to 1.00m Gravel Backfill = 1.00 to 4.00m Bentonite Backfill: 4.00 to 35.00m
BH03	4.00	Plain Pipe = GL to 1.00m Slotted Pipe = 1.00 to 4.00m	Concrete and Top Hat Cover Bentonite Seal = 0.50 to 1.00m Gravel Backfill = 1.00 to 4.00m Bentonite Backfill: 4.00 to 33.00m

The borehole locations can be seen on **Drawing 02**. Details of the installations can be found on the detailed borehole logs included in **Annex A**. The sections of slotted pipe were covered with a geosock and surrounded by gravel. The plain sections were surrounded with a bentonite seal. The gas monitoring results can be found in **Annex B**.

The installations were tested for carbon dioxide, methane, oxygen, carbon monoxide and hydrogen sulphide using a Gas Analyser GA5000.

Recorded gas concentrations are summarised in **Table 1.1**.

Table 1.1 Measured Gas Concentrations Summary		
Gas	Minimum Concentration	Maximum Concentration
Methane (% V/V)	Not Detected	0.3
Carbon Dioxide (% V/V)	0.6	2.8
Oxygen (% V/V)	19.4	21.3
Carbon Monoxide (ppm)	Not Detected	26
Hydrogen Sulphide (ppm)	Not Detected	Not Detected

The gas flow rate from the boreholes was also assessed, no flow was recorded from the boreholes. Based the detection limit of the gas monitoring a flow rate of 0.1 l/hr has and the highest recorded carbon dioxide concentration of 2.8%, a gas screening value of 0.0028 l/hr is calculated, as follows:

$$(2.8/100) \times 0.1 = 0.0028 \text{ l/hr}$$

When this monitoring result is compared with Table 8.5 of CIRIA report C665, the site is classified as 'Gas Characteristic Situation 1' (GCS1). Table 8.6 of the same publication confirms that no special precautions are required for a GCS1 site.

Additionally, the presence of carbon monoxide needs to be considered. In the absence of guidance for residential developments the long-term workplace exposure limit (WEL) has been adopted. This is set at 30ppm and is above the initial measured concentration of 26ppm detected on site. After the initial peak, the carbon monoxide level has subsequently dropped to negligible levels.

Carbon Monoxide is primarily formed in mine workings by the oxidation of coal, and this therefore tends to occur at hazardous levels after coal has been worked and builds up when the mine is no longer operational, and ventilation has ceased. The initial peak is interpreted to be a small release from the coal that was encountered and disturbed during the drilling process and not from a significant reservoir or gas.

As no mine workings have been encountered it is considered that there is no reservoir of mine gas, including carbon monoxide within influencing distance of the site.

Additionally, during the drilling process the drillers used gas monitors to measure concentrations of gases at the borehole locations. No gas emissions were recorded by the drillers during the drilling works.

We trust that the above is to your satisfaction, however, should you have any queries or require any further information please do not hesitate to contact us.

Yours sincerely

For: Terra Firma (Wales) Limited



Mr Alan Beattie

Enc.

Annex A - Borehole Logs

Annex B - Gas Monitoring Results

Drawing 01 – Site Layout

Annex A
Borehole Logs

Borehole Log

Borehole No.

BH01

Sheet 1 of 2

Project Name: 15 Glyn Road

Project No:
16124

Co-ords:

Hole Type
RO

Location: Lower Brynaman

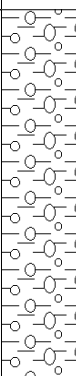
Level:

Scale
1:100

Client: Miss Elinor Jones & Mr Neville Staines

Dates: 09/02/2021 - 10/02/2021

Logged By
Apex

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
				5.00				Boulder CLAY / GRAVEL (Drillers Description)	1
									2
									3
									4
				8.50				Weathered SILTSTONE (Drillers Description)	5
									6
									7
									8
								SILTSTONE and SANDSTONE bands with dark bands (Drillers Description)	9
									10
									11
									12
									13
									14
									15
									16
									17
									18
				19.00				SANDSTONE (Drillers Description)	19
									20

Remarks: 1. Borehole cased to 7.00m. 2. No gas recorded during drilling.

Borehole Log

Borehole No.

BH01

Sheet 2 of 2

Project Name: 15 Glyn Road

Project No: 16124

Co-ords:

Hole Type
RO

Location: Lower Brynaman

Level:

Scale
1:100

Client: Miss Elinor Jones & Mr Neville Staines

Dates: 09/02/2021 - 10/02/2021

Logged By
Apex

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
								SANDSTONE (Drillers Description)	21
									22
									23
				24.00					24
				24.80				Dark MUDSTONE with COAL traces (Drillers Description)	25
								Silty MUDSTONE (Drillers Description)	26
									27
				28.00				Dark MUDSTONE (Drillers Description)	28
				28.60				SILTSTONE and MUDSTONE bands (Drillers Description)	29
									30
									31
				31.50				COAL (Drillers Description)	32
				32.50				SILTSTONE and MUDSTONE bands (Drillers Description)	33
									34
				35.00				End of Borehole at 35.000m	35
									36
									37
									38
									39
									40

Remarks: 1. Borehole cased to 7.00m. 2. No gas recorded during drilling.

Borehole Log

Borehole No.

BH02

Sheet 1 of 2

Project Name: 15 Glyn Road

Project No: 16124

Co-ords:

Hole Type
RO

Location: Lower Brynaman

Level:

Scale
1:100

Client: Miss Elinor Jones & Mr Neville Staines

Dates: 10/02/2021 - 11/02/2021

Logged By
Apex

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
								Boulder CLAY / GRAVEL (Drillers Description)	1
									2
				3.50				Weathered SILTSTONE (Drillers Description)	3
									4
				5.00				COAL (Drillers Description)	5
				5.70				Silty MUDSTONE (Drillers Description)	6
									7
				7.50				Dark MUDSTONE (Drillers Description)	8
				8.00				SILTSTONE and SANDSTONE bands (Drillers Description)	9
									10
									11
									12
									13
									14
									15
									16
									17
				18.00				Dark SILTSTONE (Drillers Description)	18
				18.40				SILTSTONE (Drillers Description)	19
									20
				20.00					

Remarks: 1. Borehole cased to 6.00m. 2. No gas recorded during drilling.

Borehole Log

Borehole No.

BH02

Sheet 2 of 2

Project Name: 15 Glyn Road

Project No:
16124

Co-ords:

Hole Type
RO

Location: Lower Brynaman

Level:

Scale
1:100

Client: Miss Elinor Jones & Mr Neville Staines

Dates: 10/02/2021 - 11/02/2021

Logged By
Apex

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
								SANDSTONE (Drillers Description)	21
									22
									23
									24
				24.70					
								SILTSTONE (Drillers Description)	25
				25.50					
				26.00				SANDSTONE (Drillers Description)	26
								SANDSTONE and SILTSTONE bands (Drillers Description)	27
									28
									29
				29.00				SILTSTONE and SANDSTONE bands (Drillers Description)	30
									31
									32
									33
				33.00				COAL (Drillers Description)	33
				33.70				SILTSTONE (Drillers Description)	34
									35
				35.00				End of Borehole at 35.000m	35
									36
									37
									38
									39
									40

Remarks: 1. Borehole cased to 6.00m. 2. No gas recorded during drilling.

Borehole Log

Borehole No.

BH03

Sheet 1 of 2

Project Name: 15 Glyn Road

Project No:
16124

Co-ords:

Hole Type
RO

Location: Lower Brynaman

Level:

Scale
1:100

Client: Miss Elinor Jones & Mr Neville Staines

Dates: 11/02/2021 - 12/02/2021

Logged By
Apex

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
								Boulder CLAY / GRAVEL (Drillers Description)	1
				3.00				Weathered SILTSTONE (Drillers Description)	2
				5.00				SILTSTONE and MUDSTONE bands (Drillers Description)	3
									4
				9.00				Dark SILTSTONE with COAL traces (Drillers Description)	5
				9.80				SILTSTONE (Drillers Description)	6
				11.00				Dark SILTSTONE with COAL traces (Drillers Description)	7
				11.60				SANDSTONE, SILTSTONE and MUDSTONE bands (Drillers Description)	8
									9
									10
									11
									12
									13
									14
									15
									16
									17
									18
									19
				20.00					20

Remarks: 1. Borehole cased to 6.00m. 2. No gas recorded during drilling.

Borehole Log

Borehole No.

BH03

Sheet 2 of 2

Project Name: 15 Glyn Road

Project No: 16124

Co-ords:

Hole Type
RO

Location: Lower Brynaman

Level:

Scale
1:100

Client: Miss Elinor Jones & Mr Neville Staines

Dates: 11/02/2021 - 12/02/2021

Logged By
Apex

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
							xxxxxx	SILTSTONE and SANDSTONE bands (Drillers Description)	21
							xxxxxx		22
							xxxxxx		23
							xxxxxx		24
				25.00			xxxxxx		25
								SANDSTONE (Drillers Description)	25
				26.00					26
							xxxxxx	SILTSTONE, SANDSTONE and MUDSTONE bands (Drillers Description)	26
							xxxxxx		27
							xxxxxx		28
							xxxxxx		29
							xxxxxx		30
							xxxxxx		31
							xxxxxx		32
				33.00			xxxxxx		33
								End of Borehole at 33.000m	34
									35
									36
									37
									38
									39
									40

Remarks: 1. Borehole cased to 6.00m. 2. No gas recorded during drilling.

Borehole Log

Borehole No.

BH04

Sheet 1 of 2

Project Name: 15 Glyn Road

Project No:
16124

Co-ords:

Hole Type
RO

Location: Lower Brynaman

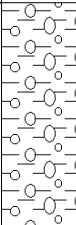
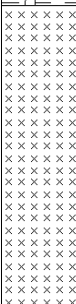
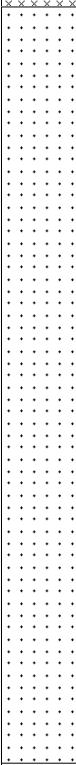
Level:

Scale
1:100

Client: Miss Elinor Jones & Mr Neville Staines

Dates: 12/02/2021 - 15/02/2021

Logged By
Apex

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
				3.00				Boulder CLAY / GRAVEL (Drillers Description)	1
									2
								Weathered SILTSTONE (Drillers Description)	3
									4
									5
									6
				7.00				COAL (Drillers Description)	7
				7.60				SILTSTONE (Drillers Description)	8
									9
				10.00				SANDSTONE and MUDSTONE bands with dark bands (Drillers Description)	10
									11
									12
									13
									14
									15
									16
									17
									18
									19
				20.00					20

Remarks: 1. Borehole cased to 6.00m. 2. No gas recorded during drilling.

Borehole Log

Borehole No.

BH04

Sheet 2 of 2

Project Name:	15 Glyn Road	Project No:	16124	Co-ords:		Hole Type	RO
Location:	Lower Brynaman	Level:		Scale	1:100	Logged By	Apex
Client:	Miss Elinor Jones & Mr Neville Staines	Dates:	12/02/2021 - 15/02/2021				

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m)	Well	Legend	Stratum Description	
	Depth (m)	Type	Results						
								SANDSTONE and SILTSTONE bands (Drillers Description)	21
									22
									23
									24
									25
									26
									27
				28.20					28
								SILTSTONE and SANDSTONE bands (Drillers Description)	29
									30
									31
				31.50				COAL (Drillers Description)	32
				32.20				SILTSTONE (Drillers Description)	33
				33.50				End of Borehole at 33.500m	34
									35
									36
									37
									38
									39
									40

Remarks: 1. Borehole cased to 6.00m. 2. No gas recorded during drilling.

Annex B
Gas Monitoring Results

In-Situ Gas Monitoring Results

Job Number 16124

Job Name Glyn Road, Lower Brynmanan



Round 1

Date: 09.03.2021

Barometric Pressure: 1004mb

Weather: Dry

Gas Monitoring Well Number	Methane (CH ₄) %	Oxygen (O ₂) %	Carbon Dioxide (CO ₂) %	Carbon Monoxide (CO) ppm	Hydrogen Sulphide (H ₂ S) %	Flow (l/hr)
BH02	N/D	21.3	0.6	N/D	N/D	No Flow
BH03	N/D	21.3	0.9	26	N/D	No Flow

Round 2

Date: 19.03.2021

Barometric Pressure: 1013mb

Weather: Dry

Gas Monitoring Well Number	Methane (CH ₄) %	Oxygen (O ₂) %	Carbon Dioxide (CO ₂) %	Carbon Monoxide (CO) ppm	Hydrogen Sulphide (H ₂ S) %	Flow (l/hr)
BH02	0.2	20.5	1.1	N/D	N/D	No Flow
BH03	0.1	20.1	1.7	1.0	N/D	No Flow

Round 3

Date: 01.04.2021

Barometric Pressure: 1005mb

Weather: Dry

Gas Monitoring Well Number	Methane (CH ₄) %	Oxygen (O ₂) %	Carbon Dioxide (CO ₂) %	Carbon Monoxide (CO) ppm	Hydrogen Sulphide (H ₂ S) %	Flow (l/hr)
BH02	0.1	20.8	1.1	N/D	N/D	No Flow
BH03	0.2	20.8	1.1	N/D	N/D	No Flow

Notes:

In-Situ Gas Monitoring Results

Job Number 16124

Job Name Glyn Road, Lower Brynmanan



Round 4

Date: 12.04.2021

Barometric Pressure: 1012mb

Weather: Dry

Gas Monitoring Well Number	Methane (CH ₄) %	Oxygen (O ₂) %	Carbon Dioxide (CO ₂) %	Carbon Monoxide (CO) ppm	Hydrogen Sulphide (H ₂ S) %	Flow (l/hr)
BH02	0.2	21.2	2.8	N/D	N/D	No Flow
BH03	0.3	21.1	0.3	N/D	N/D	No Flow

Round 5

Date: 29.04.2021

Barometric Pressure: 997mb

Weather: Dry

Gas Monitoring Well Number	Methane (CH ₄) %	Oxygen (O ₂) %	Carbon Dioxide (CO ₂) %	Carbon Monoxide (CO) ppm	Hydrogen Sulphide (H ₂ S) %	Flow (l/hr)
BH02	0.2	21.1	1.8	1	N/D	No Flow
BH03	0.1	19.4	2.8	1	N/D	No Flow

Round 6

Date: 13.05.21

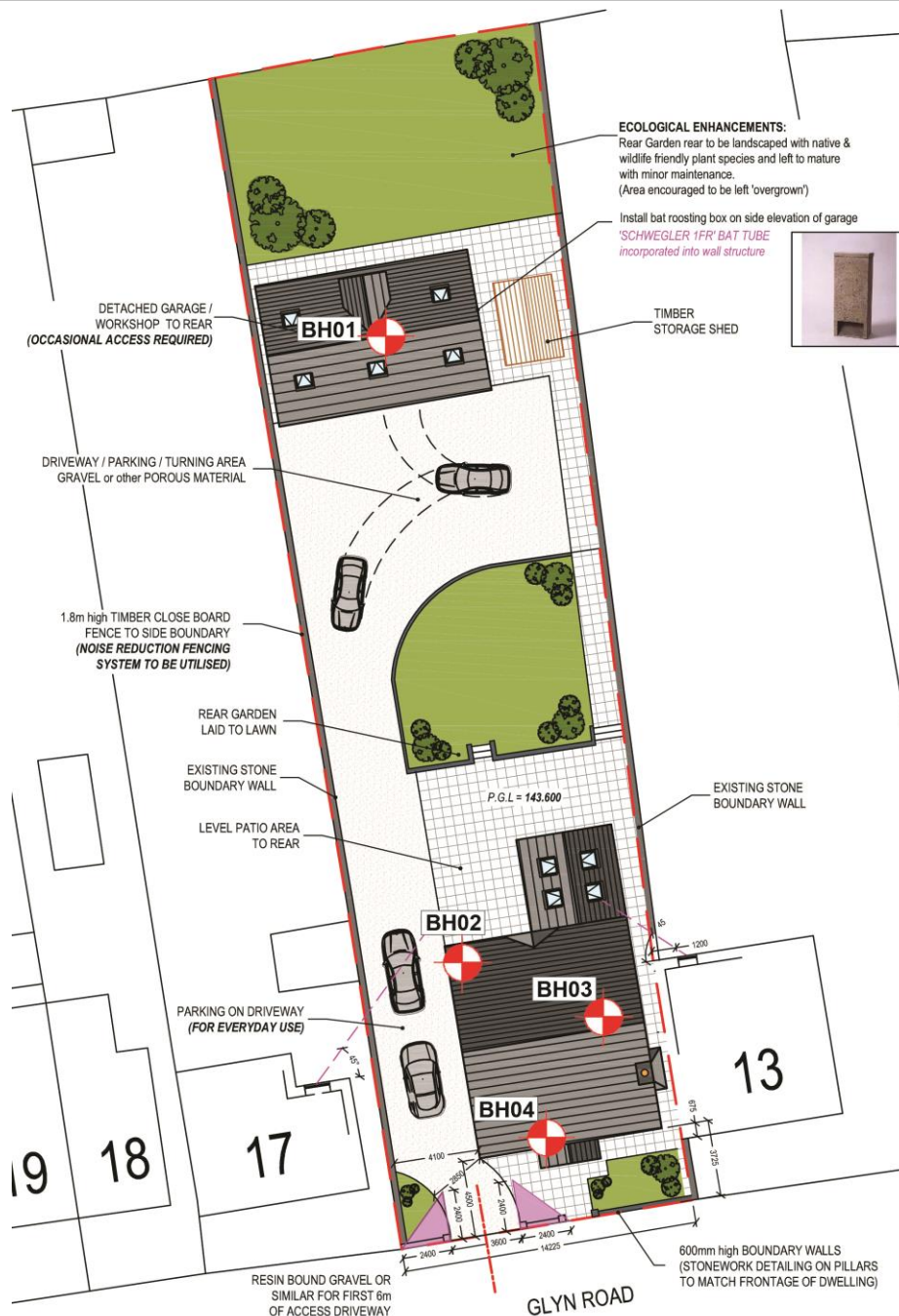
Barometric Pressure: 991mb

Weather: Dry

Gas Monitoring Well Number	Methane (CH ₄) %	Oxygen (O ₂) %	Carbon Dioxide (CO ₂) %	Carbon Monoxide (CO) ppm	Hydrogen Sulphide (H ₂ S) %	Flow (l/hr)
BH02	0.3	20.1	2.6	N/D	N/D	No Flow
BH03	0.3	20.9	0.3	N/D	N/D	No Flow

Notes:

DRAWINGS



Job Number:

16124

Job Title:

Glyn Road, Lower Brynaman

Drawing Title:

Site Layout

Drawing Number:

01

Scale:

Not To Scale

Legend:



Approximate location of rotary borehole