

# Aldi, Colliery Lane Hetton-Le-Hole

## Ground Gas Risk Assessment

*For Aldi Stores Limited*

*Date: 3 May 2023*

*Doc Ref: P18-474-3E-XX-XX-RP-G-9002*

# DOCUMENT CONTROL SHEET

|              |  |   |
|--------------|--|---|
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| Client       | Aldi Stores Limited  |   |
| Project name | Aldi, Colliery Lane Hetton-Le-Hole   |   |
| Title        | Ground Gas Risk Assessment   |   |
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| Checked and Approved by    | Alex Middleton (Senior Geo-environmental Engineer) |      |

| Document Revision Record |        |      |                  |
|--------------------------|--------|------|------------------|
| Issue Number             | Status | Date | Revision Details |
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|                          |        |      |                  |
|                          |        |      |                  |

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## 1. INTRODUCTION

### 1.1 Commission

Hydrock 3E were commissioned by Aldi Stores Limited to undertake a Phase II geo-environmental assessment for an area of land situated off Colliery Lane, Hetton-Le-Hole which included the completion of a detailed ground gas risk assessment. A site location plan is included as **Drawing G0001**.

### 1.2 Introduction

This report should be read in conjunction with the reports completed for the site by Hydrock 3E, as referenced below:

- Hydrock 3E Phase I Geo-environmental Assessment – Aldi, Colliery Lane, Hetton-Le-Hole (Report reference P18-474-3E-XX-XX-RP-G-9000 – Dated December 2018 - Issue 1).
- Hydrock 3E Phase II Geo-environmental Assessment – Aldi, Colliery Lane, Hetton-Le-Hole (Report reference P18-474-3E-XX-XX-RP-G-9001 – Dated February 2023 - Issue 1).

Fieldwork was undertaken on 12<sup>th</sup> and 13<sup>th</sup> January 2023 and comprised of ten mini-percussive boreholes (WS01 to WS10), with combined ground gas and ground water monitoring wells were installed in WS01-03, seven trial pits (TP01-07) and nine Cone Penetrometer Tests. The locations of which are shown on **Drawing G0002** with records of the exploratory hole locations shown in **Appendix A**.

Based upon the ground gas assessment undertaken as part of the Phase II investigation works, Carbon Dioxide (CO<sub>2</sub>) was recorded up to a maximum concentration of 6.00% v/v during the monitoring period, whilst Methane (CH<sub>4</sub>) was noted as absent, with a minimum Oxygen (O<sub>2</sub>) concentration of 12.30% v/v. In addition, Carbon Dioxide did not exceed the GSV minimum assessment values for a Characteristic Situation 1 (CS1) however Carbon Dioxide exceeds the maximum threshold of 5% for CS1, and therefore the initial assessment indicates the site to lie within a **Characteristic Situation 2 (CS2)**.

### 1.3 Uncertainties and Limitations

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This report presents the factual information available during this appraisal, interpretation of the data obtained and recommendations relevant to the outlined scope of works.

This report provides the findings of the final assessment carried out in May 2023 which is based upon ground gas monitoring completed between January 2023 and May 2023. The report has been prepared by Hydrock 3E on the basis of available information obtained during the investigation period. Although every reasonable effort has been made to gather all relevant information, not all potential environmental constraints or liabilities associated with the site may have been revealed. Responsibility cannot be accepted for any conditions not revealed and which have not been taken into account by this report.

This assessment has been carried out in general accordance with recognised best practice. Unless otherwise stated, no assessment has been made for the presence of radioactive substances or unexploded ordnance.

Where the phrase 'suitable for use' is used in this report, it is in keeping with the terminology used in planning control and does not imply any specific warranty or guarantee offered by Hydrock 3E.

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Any site boundary line depicted on plans does not imply legal ownership of land.

## 2. GROUND GAS RISK ASSESSMENT

In order to assess the ground gas regime below the site, a total of 3 no. gas monitoring wells, comprising slotted 50mm diameter HDPE pipe within a granular filter, were installed across the proposed development, with wells installed within WS01, WS02 and WS03. The locations of the monitoring wells are shown on **Drawing G0002**.

The wells were sealed using bentonite and a lockable cover was fitted at the surface. As part of the Phase II works the wells were monitored on six occasions between 27<sup>th</sup> January 2023 and 02<sup>nd</sup> May 2023 for Methane, Carbon Dioxide and Oxygen using a portable infra-red gas monitor. The rate of gas flow from the boreholes was also recorded using a portable flow meter and the groundwater levels were recorded using a portable dip meter. The ground gas monitoring results are presented in **Appendix B**.

### 2.1 Gas Monitoring Results

This ground gas risk assessment has been undertaken generally in accordance with CIRIA Report C665,BS8485:2015+A1:2019: Code of practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings and BS8576:2013 'Guidance on investigations for ground gas – permanent gases and volatile organic compounds (VOCs)'.

Based on the Phase I and Phase II Geo-environmental Assessment reports, primary potential sources of ground gas for this site were considered to be made ground and alluvial soils, with the site considered to be located within a low to medium risk setting with regards potential ground gas migration and/or production.

The results of the ground gas monitoring carried out as part of this assessment are summarised in the following table:

Table 2.1: Ground Gas Monitoring Results

| Position | O <sub>2</sub> (%v/v) | CO <sub>2</sub> (%v/v) | CH <sub>4</sub> (%v/v) | Steady Flow (l/hr) | Atmospheric Pressure (mb) | Gas Screening Value (l/hr) |                 |
|----------|-----------------------|------------------------|------------------------|--------------------|---------------------------|----------------------------|-----------------|
|          |                       |                        |                        |                    |                           | CH <sub>4</sub>            | CO <sub>2</sub> |
| WS01     | 18.7-21.5             | 0.10-1.8               | 0.0-0.3                | <0.1               | 0986-1025                 | <0.07                      | <0.07           |
| WS02     | 17.0-20.2             | 1.5-3.0                | 0.0-0.2                | <0.1               | 0986-1025                 | <0.07                      | <0.07           |
| WS03     | 12.3-21.2             | 0.1-6.9                | 0.0-0.1                | <0.1               | 0986-1025                 | <0.07                      | <0.07           |

From the results of the gas monitoring, Methane (CH<sub>4</sub>) was recorded up to a maximum concentration of 0.3% v/v, whilst Carbon Dioxide (CO<sub>2</sub>) was recorded up to a maximum concentration of 6.90% v/v. A maximum flow rate of <0.1l/hr was recorded during the monitoring programme, Whilst occasional depleted Oxygen levels were also recorded to a minimum value of 12.30% v/v.

For the purposes of this assessment the risk to the site from ground gases has been evaluated by converting the results in the table above to a gas screening value (GSV), which is calculated by multiplying the typical maximum gas concentrations with the recorded maximum positive steady flow rate. The 'worst-case' GSV's for Methane and Carbon Dioxide have been calculated, using the maximum recorded value of CH<sub>4</sub> concentration of 0.3% and maximum CO<sub>2</sub> concentration of 6.9% v/v with the flow rate taken as 0.1l/hr.

The GSV has be calculated as follows:

- Methane GSV = 0.003 (0.3%) X 0.1 = 0.0003l/hr
- Carbon Dioxide GSV = 0.069 (6.9%) X 0.1 = 0.0069l/hr

When considering the above, the resultant GSV for Methane has been calculated as 0.0003l/hr whilst Carbon Dioxide has been calculated as 0.0063l/hr. From these results it can be seen that the GSV value does not exceed the GSV minimum assessment value of 0.07l/hr (Characteristic Situation 1 – CS1).

However, when considering Carbon Dioxide exceeds the 5% threshold value for CS1, the site will be classified as Characteristic Situation 2 – CS2, indicating ground gas protective measures are required for the proposed development.

In addition to the above, photoionisation detector (PID) testing was undertaken on the visits undertaken between the 8<sup>th</sup> March 2023 and the 2<sup>nd</sup> May 2023 with recording VOCs at concentrations of between 0.0ppm and 0.3ppm. From the results, the risk of vapour ingress into buildings is considered to be very low and therefore at this stage it is considered there is no requirement for a hydrocarbon vapour barrier within proposed developments on the site.

## 2.2 Radon

From the 1<sup>st</sup> December 2022, the UK Health Agency (UKHSA) and British Geological Survey published updated information pertaining to levels of risk posed by Radon. When considering the initial radon assessment within the Phase I Geo-environmental assessment report pre-dates the updated radon information sources, an updated envirocheck datasheet report was obtained as part of the Phase II Geo-environmental Assessment, which confirms an absence of risk and therefore no radon protection measures are required for this site.

## 2.3 Conclusions

Based on gas monitoring results a Gas Screening Value (GSV) of <0.07l/hr has been calculated for both Methane and Carbon Dioxide resulting in the site falling within a CIRIA C665 and BS8485:2015+A1:2019 Characteristic Situation 1 (CS1). However, due to the presence of elevated Carbon Dioxide above the 5% threshold for CS1, the site will be classified as a **Characteristic Situation 2 (CS2)**, indicating ground gas protective measures are required for the site.

Furthermore to the above, photoionisation detector (PID) testing undertaken confirms there is no requirement for a hydrocarbon vapour barrier.

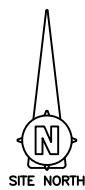
The site is **not** located within an area where radon protective measures are required.

# Drawings





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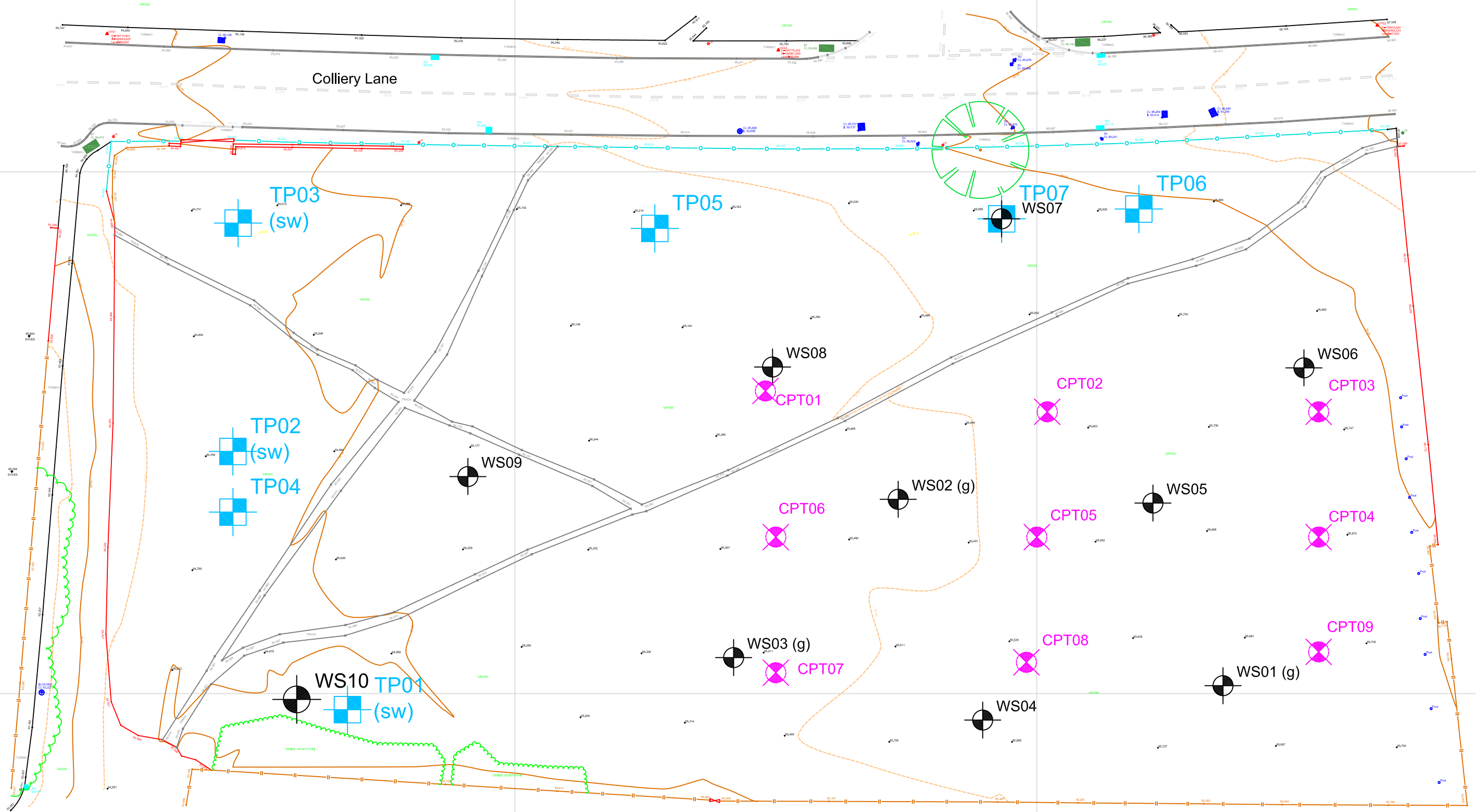
| Date | Revision | Checked | Rev. |
|------|----------|---------|------|
|      |          |         |      |






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|                |             |  |          |
|----------------|-------------|--|----------|
| Project        |             | Colliery Lane, Hetton-le-Hole<br>for Aldi Stores Limited |          |
| Title          |             | Site Location Plan                                       |          |
| Scale          | Drawn       | Checked  | Date     |
| 1:25,000 at A4 | AM          | NW   | Jan 2023 |
| Job No         | Drawing No. |  | Rev      |
| P18-474        | G0001       |  | 0        |



Key:

|  |     |  |
|--|-----|--|
|  | WS  | Mini Percussive Borehole Location, (g) Denotes Location of Combined Ground Gas and Groundwater Monitoring Well |
|  | TP  | Trial Pit Locations, (sw) denotes Location of Soakaway Test  |
|  | CPT | Location of Cone Penetrometer Test   |

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|   |                   |            |               |
|---|-------------------|------------|---------------|
| Project Colliery Lane, Hetton-le-Hole for Aldi Stores Limited |                   |            |               |
| Title Exploratory Hole Location Plan                          |                   |            |               |
| Scale NTS   | Drawn AM          | Checked NW | Date Jan 2023 |
| Job No. P18-474   | Drawing No. G0002 | Rev 2      |               |

# Appendix A

## *Exploratory Hole Records*

# Borehole Log

Borehole No.

**WS01**

Sheet 1 of 1

Project Name: Aldi Hetton Le Hole

Project No.  
P18-474

Co-ords: -

Hole Type  
WLS

Location: Hetton Le Hole

Level:

Scale  
1:50

Client: Aldi Stores Limited

Dates: 12/01/2023 - 12/01/2023

Logged By  
AM

| Well | Water Strikes | Samples and In Situ Testing |      |                   | Depth (m) | Level (m) | Legend  | Stratum Description                |
|------|---------------|-----------------------------|------|-------------------|-----------|-----------|---|------------------------------------|
|      |               | Depth (m)                   | Type | Results           |           |           |   |                                    |
|      |               | 0.20                        | ES   |                   | 0.25      |           | MADE GROUND: Grass over dark brown sandy clay with sandstone gravel and rootlets. |                                    |
|      |               | 0.50                        | D    |                   |           |           | Firm brown and grey friable sandy CLAY with occasional gravel and sand lens.      |                                    |
|      |               | 1.00                        | D    |                   |           |           |   |                                    |
|      |               | 1.00                        |      | N=9 (1,1/1,2,2,4) |           |           |   |                                    |
|      |               | 1.60                        | D    |                   |           |           |   | Soft brown very sandy clayey SILT. |
|      |               | 2.00                        | D    |                   |           |           |   |                                    |
|      |               | 2.00                        |      | N=7 (1,1/1,2,2,2) |           |           |   |                                    |
| 3.00 | D             |                             |      |                   |           |           |   |                                    |
| 3.00 |               | N=3 (1,1/0,1,1,1)           |      |                   |           |           |   |                                    |
| 4.00 | D             |                             |      |                   | 3.80      |           | Soft grey silty sandy CLAY.   |                                    |
| 4.00 |               | N=4 (1,0/0,1,1,2)           |      |                   | 4.00      |           | Solid drilling, no recovery.  |                                    |
|      |               |                             |      |                   |           |           |   |                                    |
|      |               | 5.00                        |      |                   |           |           |   |                                    |
|      |               |                             |      |                   | 5.45      |           |   |                                    |
|      |               |                             |      |                   |           |           | End of borehole at 5.45 m   |                                    |

Remarks

- Borehole terminated at a depth of 5.45m upon completion.
- Solid drilling with no recovery between 5.00m to 5.45.
- Groundwater encountered at a depth of 2.00m.



# Borehole Log

Borehole No.

**WS02**

Sheet 1 of 1

Project Name: Aldi Hetton Le Hole

Project No.  
P18-474

Co-ords: -

Hole Type  
WLS

Location: Hetton Le Hole

Level:

Scale  
1:50

Client: Aldi Stores Limited

Dates: 12/01/2023 - 12/01/2023

Logged By  
AM

| Well | Water Strikes | Samples and In Situ Testing |                             |                             | Depth (m) | Level (m)   | Legend  | Stratum Description |
|------|---------------|-----------------------------|-----------------------------|-----------------------------|-----------|---|---|---------------------|
|      |               | Depth (m)                   | Type                        | Results                     |           |   |   |                     |
|      |               | 0.20                        | ES                          |                             | 0.30      |   | MADE GROUND: Grass over dark brown sandy clay with sandstone gravel and rootlets. |                     |
|      |               | 0.50                        | ES                          |                             |           |   | Firm brown and grey friable sandy CLAY with occasional gravel and sand lens.      |                     |
|      |               | 1.00                        | D                           | N=7 (1,2/1,1,2,3)           | 1.50      |   | Soft grey clayey SILT/ silty CLAY with occasional gravel and sand lens.           |                     |
|      |               | 1.00                        |                             | HVP=31                      |           |   |   |                     |
|      |               | 1.60                        | D                           |                             | 2.00      |   | Soft grey clayey SILT/ silty CLAY with occasional gravel and sand lens.           |                     |
|      |               | 2.00                        | D                           | N=5 (1,2/1,1,1,2)<br>HVP=17 |           |   |   |                     |
|      |               | 2.00                        |                             |                             | 3.00      |   | Soft grey clayey SILT/ silty CLAY with occasional gravel and sand lens.           |                     |
|      |               | 3.00                        | D                           | N=3 (0,0/0,0,1,2)<br>HVP=14 |           |   |   |                     |
|      |               | 4.00                        |                             |                             | 4.00      |   | Soft grey clayey SILT/ silty CLAY with occasional gravel and sand lens.           |                     |
|      |               | 4.00                        |                             | N=6 (3,3/2,1,1,2)           |           |   |   |                     |
|      | 5.00          |                             |                             | 5.00                        |           | Soft grey clayey SILT/ silty CLAY with occasional gravel and sand lens. |   |                     |
|      | 5.00          | D                           | N=0 (0,0/0,0,0,0)<br>HVP=21 |                             |           |   |   |                     |
|      |               |                             |                             | 5.45                        |           |   | End of borehole at 5.45 m   |                     |

Remarks  
 1. Borehole terminated at a depth of 5.45m upon completion.  
 2. Groundwater encountered at a depth of 2.40m.

Project Name: Aldi Hetton Le Hole

 Project No.  
P18-474

Co-ords: -

 Hole Type  
WLS

Location: Hetton Le Hole

Level:

 Scale  
1:50

Client: Aldi Stores Limited

Dates: 12/01/2023 - 12/01/2023

 Logged By  
AM

| Well | Water Strikes | Samples and In Situ Testing |                              |                    | Depth (m) | Level (m) | Legend  | Stratum Description   |
|------|---------------|-----------------------------|------------------------------|--------------------|-----------|-----------|---|---|
|      |               | Depth (m)                   | Type                         | Results            |           |           |   |   |
|      |               | 0.20                        | ES                           |                    | 0.30      |           | MADE GROUND: Grass over dark brown sandy clay with sandstone gravel and rootlets.   |   |
|      |               | 0.50                        | ES                           |                    |           |           | MADE GROUND: Brown sand and gravel of sandstone and mudstone with occasional brick. |   |
|      |               | 1.00                        | ES                           | N=10 (1,2/1,3,2,4) | 1.00      |           |   | MADE GROUND: Black clayey sand with occasional rootlets (relic topsoil).                    |
|      |               | 1.10                        |                              |                    | 1.20      |           |   |   |
|      |               | 1.50                        | D                            |                    |           |           |   | Loose to medium dense brown slightly silty slightly clayey SAND with occasional clay bands. |
|      |               | 2.00                        | D                            | N=8 (1,1/1,1,2,4)  | 2.00      |           |   |   |
|      |               | 2.00                        |                              |                    |           |           |   |   |
|      |               | 3.00                        | D                            | N=15 (1,1/2,3,5,5) | 3.00      |           |   |   |
|      |               | 3.00                        |                              |                    |           |           |   |   |
|      |               | 4.00                        | D                            | N=13 (1,2/2,3,4,4) | 4.00      |           |   |   |
|      | 4.00          |                             |                              |                    |           |           |   |   |
|      | 5.00          | D                           | N=12 (1,1/2,3,3,4)<br>HVP=11 | 4.45               |           |           | Soft grey clayey SILT.  |   |
|      | 5.00          |                             |                              | 5.45               |           |           |   |   |
|      |               |                             |                              |                    |           |           | End of borehole at 5.45 m   |   |

**Remarks**

- Borehole terminated at a depth of 5.45m upon completion.
- Groundwater encountered at a depth of 1.70m.

# Borehole Log

Borehole No.

**WS04**

Sheet 1 of 1

Project Name: Aldi Hetton Le Hole

Project No.  
P18-474

Co-ords: -

Hole Type  
WLS

Location: Hetton Le Hole

Level:

Scale  
1:50

Client: Aldi Stores Limited

Dates: 12/01/2023 - 12/01/2023

Logged By  
AM

| Well | Water Strikes | Samples and In Situ Testing |      |                    | Depth (m)    | Level (m) | Legend   | Stratum Description |  |
|------|---------------|-----------------------------|------|--------------------|--------------|-----------|--|---------------------|--|
|      |               | Depth (m)                   | Type | Results            |              |           |  |                     |  |
|      |               | 0.20                        | D    |                    | 0.35         |           | MADE GROUND: Grass over dark brown sandy clay with sandstone gravel and rootlets.  |                     |  |
|      |               | 0.50                        | ES   |                    | 0.60         |           | MADE GROUND: Black clayey sand with occasional rootlets (relic topsoil).   |                     |  |
|      |               | 1.00                        | D    | N=4 (1,0/1,1,1,1)  |              |           | Soft brown very sandy very gravelly CLAY. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone and limestone. | 1                   |  |
|      |               | 2.00                        | D    | N=10 (1,2/2,1,3,4) | 2.00         |           | Loose grey slightly gravelly SAND. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone and limestone.        | 2                   |  |
|      |               | 2.70                        | D    |                    | 2.50         |           | Loose brown SAND.  |                     |  |
|      |               | 3.00                        | D    | N=0 (1,0/0,0,0,0)  | 3.00         |           | Loose grey slightly gravelly SAND. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone and limestone.        | 3                   |  |
|      |               | 3.10                        | D    |                    | 3.20         |           | Very loose brown silty sandy fine to coarse, subrounded to subangular GRAVEL of mudstone, sandstone and limestone.                 |                     |  |
|      |               | 3.50                        | D    |                    |              |           | Soft grey clayey SILT.   | 4                   |  |
|      |               | 4.00                        | D    | N=1 (1,1/1,0,0,0)  | 3.90<br>4.00 |           | Solid drilling, no recovery.   |                     |  |
|      |               | 5.00                        |      | N=2 (1,1/1,0,0,1)  |              |           |  | 5                   |  |
|      |               |                             |      | 5.45               |              |           | End of borehole at 5.45 m  | 6                   |  |
|      |               |                             |      |                    |              |           |  | 7                   |  |
|      |               |                             |      |                    |              |           |  | 8                   |  |
|      |               |                             |      |                    |              |           |  | 9                   |  |
|      |               |                             |      |                    |              |           |  | 10                  |  |

Remarks  
 1. Borehole terminated at a depth of 5.45m upon completion.  
 2. Groundwater encountered at a depth of 1.00m.



# Borehole Log

Borehole No.

**WS05**

Sheet 1 of 1

Project Name: Aldi Hetton Le Hole

Project No.  
P18-474

Co-ords: -

Hole Type  
WLS

Location: Hetton Le Hole

Level:

Scale  
1:50

Client: Aldi Stores Limited

Dates: 12/01/2023 - 12/01/2023

Logged By  
AM

| Well                      | Water Strikes | Samples and In Situ Testing |      |                    | Depth (m) | Level (m)  | Legend   | Stratum Description |   |
|---------------------------|---------------|-----------------------------|------|--------------------|-----------|--|--|---------------------|---|
|                           |               | Depth (m)                   | Type | Results            |           |  |  |                     |   |
|                           |               | 0.20                        | D    |                    | 0.40      |  | MADE GROUND: Grass over dark brown sandy clay with sandstone gravel and rootlets.                                    |                     |   |
|                           |               | 0.50                        | ES   |                    | 0.65      |  | MADE GROUND: Black clayey sand with occasional rootlets (relic topsoil).   |                     |   |
|                           |               | 1.00                        | D    | N=11 (1,2/3,3,2,3) |           |  | Medium dense brown sandy clayey fine to coarse subrounded to subangular GRAVEL of mudstone, sandstone and limestone. |                     |   |
|                           |               | 1.00                        | D    |                    |           |  |  |                     |   |
|                           |               | 1.50                        | D    |                    |           |  |  |                     |   |
|                           |               | 2.00                        | D    | N=4 (0,0/1,1,1,1)  |           | 2.00   |  |                     | Loose brown sandy fine to coarse, subrounded to subangular GRAVEL of sandstone, mudstone and limestone. |
|                           |               | 2.20                        | D    |                    |           | 2.40   |  |                     |   |
|                           |               | 3.00                        | D    | N=4 (1,2/1,1,1,1)  |           | 3.10   |  |                     | Soft grey and brown sandy SILT.   |
|                           |               | 3.00                        | D    |                    |           |  |  |                     |   |
|                           |               | 3.20                        | D    |                    |           | 3.30   |  |                     |   |
| 4.00                      | D             | N=10 (2,1/3,3,2,2)          |      | 4.60               |           | Soft grey and brown sandy SILT.  |  |                     |   |
| 4.00                      | D             |                             |      |                    |           |  |  |                     |   |
| 5.00                      | D             | N=8 (2,2/3,2,1,2)<br>HVP=89 |      | 5.45               |           | Stiff grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone and limestone. |  |                     |   |
| 5.00                      | D             |                             |      |                    |           |  |  |                     |   |
| End of borehole at 5.45 m |               |                             |      |                    |           |  |  |                     |   |

**Remarks**

- Borehole terminated at a depth of 5.45m upon completion.
- Groundwater encountered at a depth of 2.00m.





# Borehole Log

Borehole No.

**WS06**

Sheet 1 of 1

Project Name: Aldi Hetton Le Hole

Project No.  
P18-474

Co-ords: -

Hole Type  
WLS

Location: Hetton Le Hole

Level:

Scale  
1:50

Client: Aldi Stores Limited

Dates: 13/01/2023 - 13/01/2023

Logged By  
AM

| Well | Water Strikes | Samples and In Situ Testing |      |                             | Depth (m)    | Level (m) | Legend  | Stratum Description |
|------|---------------|-----------------------------|------|-----------------------------|--------------|-----------|---|---------------------|
|      |               | Depth (m)                   | Type | Results                     |              |           |   |                     |
|      |               | 0.20                        | ES   |                             | 0.50         |           | MADE GROUND: Dark brown clayey sand with rootlets and wood.   |                     |
|      |               | 1.00<br>1.00                | D    | N=19 (3,3/3,8,4,4)          |              |           | Medium dense brown slightly clayey slightly gravelly SAND. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone and limestone. |                     |
|      |               | 1.50                        | D    |                             |              |           |   |                     |
|      |               | 2.00<br>2.10                | D    | N=4 (1,1/1,1,1,1)           | 2.00<br>2.20 |           | Brown sandy fine to coarse, subrounded to subangular GRAVEL of sandstone, mudstone and limestone.<br>Soft brown very sandy CLAY.                    |                     |
|      |               | 3.00<br>3.00                | D    | N=2 (3,0/0,0,1,1)<br>HVP=41 |              |           |   |                     |
|      |               | 4.00<br>4.00                | D    | HVP=27<br>N=6 (2,2/2,1,2,1) | 4.00<br>4.60 |           | Loose brown SAND.<br>Soft grey sandy silty CLAY.  |                     |
|      |               | 5.00<br>5.00                | D    | N=7 (3,3/3,2,1,1)           | 5.45         |           | End of borehole at 5.45 m   |                     |

Remarks  
1. Borehole terminated at a depth of 5.45m upon completion.  
2. Groundwater encountered at a depth of 1.40m.

# Borehole Log

Borehole No.

**WS07**

Sheet 1 of 1

|                                   |                                |            |               |
|-----------------------------------|--------------------------------|------------|---------------|
| Project Name: Aldi Hetton Le Hole | Project No. P18-474            | Co-ords: - | Hole Type WLS |
| Location: Hetton Le Hole          | Level:                         |            | Scale 1:50    |
| Client: Aldi Stores Limited       | Dates: 13/01/2023 - 13/01/2023 |            | Logged By AM  |

| Well                      | Water Strikes | Samples and In Situ Testing |      |                    | Depth (m) | Level (m)                    | Legend   | Stratum Description |  |
|---------------------------|---------------|-----------------------------|------|--------------------|-----------|------------------------------|--|---------------------|--|
|                           |               | Depth (m)                   | Type | Results            |           |                              |  |                     |  |
|                           |               | 0.30                        | ES   |                    | 0.40      |                              | MADE GROUND: Dark brown clayey sand with rootlets and wood.  |                     |  |
|                           |               | 0.50                        | D    |                    |           |                              | Brown slightly clayey slightly gravelly SAND. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone and limestone. |                     |  |
|                           |               | 1.00                        |      | N=15 (3,4/4,4,3,4) | 1.10      |                              | Firm brown friable sandy gravelly CLAY. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone and limestone.       |                     |  |
|                           |               | 1.50                        | D    |                    |           |                              |  |                     |  |
|                           |               | 2.00                        | D    | N=5 (2,2/2,1,1,1)  | 2.20      |                              | Firm becoming soft brown and grey silty sandy CLAY.  |                     |  |
|                           |               | 2.00                        |      |                    |           |                              |  |                     |  |
|                           |               | 2.50                        | D    | HVP=30             |           |                              |  |                     |  |
|                           |               |                             |      | HVP=9              |           |                              |  |                     |  |
|                           |               | 3.00                        |      | N=0 (1,0/0,0,0,0)  | 3.00      |                              | Running SAND. (Confirmed via TP07)   |                     |  |
|                           |               |                             |      |                    |           |                              |  |                     |  |
|                           |               |                             |      | 4.00               |           | Stiff grey silty sandy CLAY. |  |                     |  |
|                           |               |                             |      | 4.50               |           |                              |  |                     |  |
|                           |               |                             |      | 5.00               |           |                              |  |                     |  |
|                           |               |                             |      | 5.45               |           |                              |  |                     |  |
| End of borehole at 5.45 m |               |                             |      |                    |           |                              |  |                     |  |

Remarks

- Borehole terminated at a depth of 5.45m upon completion.
- Possible void noted between depths of 3.00m and 4.00m.
- Groundwater encountered at a depth of 2.00m.



# Borehole Log

Borehole No.

**WS08**

Sheet 1 of 1

|                                   |                                |            |               |
|-----------------------------------|--------------------------------|------------|---------------|
| Project Name: Aldi Hetton Le Hole | Project No. P18-474            | Co-ords: - | Hole Type WLS |
| Location: Hetton Le Hole          | Level:                         |            | Scale 1:50    |
| Client: Aldi Stores Limited       | Dates: 13/01/2023 - 13/01/2023 |            | Logged By AM  |

| Well | Water Strikes | Samples and In Situ Testing |      |                              | Depth (m) | Level (m) | Legend | Stratum Description  |                           |
|------|---------------|-----------------------------|------|------------------------------|-----------|-----------|--------|--|---------------------------|
|      |               | Depth (m)                   | Type | Results                      |           |           |        |  |                           |
|      |               | 0.20                        | ES   |                              |           |           |        | MADE GROUND: Dark brown and black clayey sand with brick, glass, metal and coal.   |                           |
|      |               | 1.00<br>1.00                | D    | N=15 (4,4/4,3,4,4)           | 0.90      |           |        | Firm brown friable sandy gravelly CLAY. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone and limestone. | 1                         |
|      |               | 1.90<br>2.00                | D    | N=8 (1,3/2,2,2,2)            | 2.00      |           |        | Soft and firm brown very sandy CLAY.   | 2                         |
|      |               | 2.50                        | D    | HVP=13                       | 2.80      |           |        |  |                           |
|      |               | 3.00<br>3.00                | D    | N=12 (3,2/3,3,2,4)<br>HVP=40 |           |           |        | Soft and firm grey silty sandy CLAY.   | 3                         |
|      |               | 3.50                        | D    | HVP=6                        |           |           |        |  |                           |
|      |               | 4.00                        | D    | N=8 (0,0/0,2,3,3)<br>HVP=50  |           |           |        |  | 4                         |
|      |               | 4.50                        | D    | HVP=2                        |           |           |        |  |                           |
|      |               | 5.00<br>5.00                | D    | N=17 (2,3/4,4,5,4)<br>HVP=47 | 5.45      |           |        |  | 5                         |
|      |               |                             |      |                              |           |           |        |  | End of borehole at 5.45 m |

Remarks

- Borehole terminated at a depth of 5.45m upon completion.
- No groundwater encountered.



# Borehole Log

Borehole No.

**WS09**

Sheet 1 of 1

|                                   |                                |            |               |
|-----------------------------------|--------------------------------|------------|---------------|
| Project Name: Aldi Hetton Le Hole | Project No. P18-474            | Co-ords: - | Hole Type WLS |
| Location: Hetton Le Hole          | Level:                         |            | Scale 1:50    |
| Client: Aldi Stores Limited       | Dates: 13/01/2023 - 13/01/2023 |            | Logged By AM  |

| Well | Water Strikes | Samples and In Situ Testing |                   |                    | Depth (m) | Level (m) | Legend                       | Stratum Description  |    |
|------|---------------|-----------------------------|-------------------|--------------------|-----------|-----------|------------------------------|--|----|
|      |               | Depth (m)                   | Type              | Results            |           |           |                              |  |    |
|      |               | 0.50                        | ES                |                    |           |           |                              | MADE GROUND: Dark brown and black clayey sand with brick, glass, metal and coal.   |    |
|      |               | 1.00                        |                   | N=8 (2,2/3,2,2,1)  | 1.00      |           |                              |  | 1  |
|      |               | 1.20                        | ES                |                    |           | 1.35      |                              | MADE GROUND: Black clayey sand with occasional rootlets (relic topsoil).   |    |
|      |               | 1.50                        | D                 |                    |           |           |                              | Brown gravelly SAND. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone and limestone.                                    |    |
|      |               | 2.00                        |                   | N=10 (3,3/3,3,2,2) | 2.00      |           |                              |  | 2  |
|      |               | 2.50                        | D                 |                    |           |           |                              | Soft and firm grey and brown sandy gravelly CLAY. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone, limestone and coal. |    |
|      |               | 3.00                        | D                 |                    |           | 3.10      |                              |  | 3  |
|      |               | 3.00                        |                   | N=9 (1,1/2,3,2,2)  |           |           |                              | Soft brown sandy SILT with occasional sand partings  |    |
|      |               | 3.50                        | D                 |                    |           |           |                              |  |    |
|      |               | 4.00                        |                   | N=17 (4,4/4,4,5,4) | 4.00      |           |                              | Medium dense brown SAND.   | 4  |
|      | 4.50          | D                           |                   |                    |           |           |                              |  |    |
|      | 5.00          | D                           |                   |                    | 4.90      |           | Stiff grey silty sandy CLAY. | 5  |    |
|      | 5.00          |                             | N=6 (1,1/1,0,1,4) |                    |           |           |                              |  |    |
|      |               |                             |                   | 5.45               |           |           |                              | End of borehole at 5.45 m  | 6  |
|      |               |                             |                   |                    |           |           |                              |  | 7  |
|      |               |                             |                   |                    |           |           |                              |  | 8  |
|      |               |                             |                   |                    |           |           |                              |  | 9  |
|      |               |                             |                   |                    |           |           |                              |  | 10 |

Remarks  
 1. Borehole terminated at a depth of 5.45m upon completion.  
 2. No groundwater encountered.



# Borehole Log

Borehole No.

**WS10**

Sheet 1 of 1

|                                   |                                |            |               |
|-----------------------------------|--------------------------------|------------|---------------|
| Project Name: Aldi Hetton Le Hole | Project No. P18-474            | Co-ords: - | Hole Type WLS |
| Location: Hetton Le Hole          | Level:                         |            | Scale 1:50    |
| Client: Aldi Stores Limited       | Dates: 13/01/2023 - 13/01/2023 |            | Logged By AM  |

| Well | Water Strikes | Samples and In Situ Testing |      |                              | Depth (m) | Level (m) | Legend                    | Stratum Description  |   |
|------|---------------|-----------------------------|------|------------------------------|-----------|-----------|---------------------------|--|---|
|      |               | Depth (m)                   | Type | Results                      |           |           |                           |  |   |
|      |               | 0.20                        | ES   |                              | 0.35      |           |                           | MADE GROUND: Dark brown and black clayey sand with brick, glass, metal and coal. |   |
|      |               | 1.00                        | ES   | N=13 (3,3/2,4,4,3)           | 1.10      |           |                           | MADE GROUND: Brown and black sand with sandstone, mudstone, brick and coal.      |   |
|      |               | 1.00                        |      |                              |           |           |                           |  | Medium dense brown SAND.  |
|      |               | 1.50                        | D    |                              |           |           |                           |  |   |
|      |               | 1.90                        | D    | N=9 (6,1/2,2,2,3)            | 2.00      |           |                           |  | Black silty organic SAND.   |
|      |               | 2.00                        |      |                              |           |           |                           |  | Loose to medium dense brown and grey clayey gravelly SAND. Gravel is fine to coarse, subrounded to subangular of sandstone, mudstone and limestone. |
|      |               | 2.50                        | D    |                              |           |           |                           |  |   |
|      |               | 3.00                        |      | N=15 (3,3/3,4,4,4)           |           |           |                           |  |   |
|      |               | 3.50                        |      |                              |           |           |                           |  |   |
|      |               | 4.00                        | D    | N=49 (7,8/8,14,12,15) HVP=30 | 4.45      |           |                           |  | Firm grey sandy silty CLAY.   |
|      |               |                             |      |                              |           |           | End of borehole at 4.45 m |  |   |

Remarks

- Borehole terminated at a depth of 4.45m upon refusal of sampling equipment.
- No groundwater encountered.



# Appendix B

## *Ground Gas Monitoring Record Sheets*

**Ground Gas and Water Monitoring Certificate**



Site: Aldi, Hetton Le Hole  
 Project No. P18-474  
 Date: 27.01.2023

| Borehole   | Gas Flow (l/hr) |        | Time | Atmospheric Pressure (mB) | Methane (%v/v) |        | Methane (% LEL*) |        | Carbon Dioxide (%v/v) |        | Oxygen (%v/v) |        | Other Gases (ppm) |                  |     | Depth to Water (mBGL) |
|--|-----------------|--------|------|---------------------------|----------------|--------|------------------|--------|-----------------------|--------|---------------|--------|-------------------|------------------|-----|-----------------------|
|  | Initial         | Steady |      |                           | Initial        | Steady | Initial          | Steady | Initial               | Steady | Initial       | Steady | PID               | H <sub>2</sub> S | CO  |                       |
| WS01   | <0.1            | <0.1   | -    | 1025                      | 0.0            | 0.0    | 000              | 000    | 1.00                  | 1.00   | 20.70         | 20.70  | -                 | 0.0              | 0.0 | 1.60                  |
| WS02   | <0.1            | <0.1   | -    | 1025                      | 0.0            | 0.0    | 000              | 000    | 2.60                  | 2.60   | 19.20         | 19.20  | -                 | 0.0              | 0.0 | 2.00                  |
| WS03   | <0.1            | <0.1   | -    | 1025                      | 0.0            | 0.0    | 000              | 000    | 5.10                  | 5.10   | 15.80         | 15.80  | -                 | 0.0              | 0.0 | 2.40                  |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
| <b>Notes:</b><br>Monitoring should be for <b>not less</b> than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes<br>* LEL = Lower Explosive Limit = 5%v/v. mBGL = metres Below Ground Level. |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |

| Relevant Information At Time Of Monitoring |                            |     |                             |
|--|----------------------------|-----|-----------------------------|
| Monitored by:                              | AM                         |     |                             |
| Atmospheric Pressure (mB):                 | 1025                       |     |                             |
| Weather:                                   | Dry and Sunny              |     |                             |
| Atmospheric Pressure Trend:                | Falling                    |     |                             |
| Equipment Used:                            | Infra-red Gas Analyser     | Yes | Last calibrated: 23.06.2022 |
|  | Mass Balance Transducer    | ~   | Last calibrated: ~          |
|  | Tiger PID                  | ~   | Last calibrated: ~          |
| Visible Signs of Vegetation Stress:        | None of significance noted |     |                             |
| Other Comments / Observations:             | ~                          |     |                             |
| Boreholes Sampled For Laboratory Analysis: | ~                          |     |                             |

# Ground Gas and Water Monitoring Certificate



**Site:** Aldi, Hetton Le Hole  
**Project No.** P18-474  
**Date:** 01.02.2023

| Borehole   | Gas Flow (l/hr) |        | Time | Atmospheric Pressure (mB) | Methane (%v/v) |        | Methane (% LEL*) |        | Carbon Dioxide (%v/v) |        | Oxygen (%v/v) |        | Other Gases (ppm) |                  |     | Depth to Water (mBGL) |
|--|-----------------|--------|------|---------------------------|----------------|--------|------------------|--------|-----------------------|--------|---------------|--------|-------------------|------------------|-----|-----------------------|
|  | Initial         | Steady |      |                           | Initial        | Steady | Initial          | Steady | Initial               | Steady | Initial       | Steady | PID               | H <sub>2</sub> S | CO  |                       |
| WS01   | <0.1            | <0.1   | -    | 1007                      | 0.0            | 0.0    | 000              | 000    | 0.1                   | 1.0    | 20.4          | 20.4   | -                 | 0.0              | 0.0 | 1.67                  |
| WS02   | <0.1            | <0.1   | -    | 1007                      | 0.0            | 0.0    | 000              | 000    | 0.0                   | 1.50   | 20.1          | 20.1   | -                 | 0.0              | 0.0 | 2.12                  |
| WS03   | <0.1            | <0.1   | -    | 1007                      | 0.0            | 0.0    | 000              | 000    | 0.1                   | 6.0    | 12.3          | 12.3   | -                 | 0.0              | 0.0 | 2.40                  |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |
| <b>Notes:</b><br>Monitoring should be for <b>not less</b> than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes<br>* LEL = Lower Explosive Limit = 5%v/v. mBGL = metres Below Ground Level. |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |                  |     |                       |

| Relevant Information At Time Of Monitoring |                            |     |                             |
|--|----------------------------|-----|-----------------------------|
| Monitored by:                              | KRC                        |     |                             |
| Atmospheric Pressure (mB):                 | 1007                       |     |                             |
| Weather:                                   | Dry and Sunny              |     |                             |
| Atmospheric Pressure Trend:                |                            |     |                             |
| Equipment Used:                            | Infra-red Gas Analyser     | Yes | Last calibrated: 23.06.2022 |
|  | Mass Balance Transducer    | ~   | Last calibrated: ~          |
|  | Tiger PID                  | ~   | Last calibrated: ~          |
| Visible Signs of Vegetation Stress:        | None of significance noted |     |                             |
| Other Comments / Observations:             | ~                          |     |                             |
| Boreholes Sampled For Laboratory Analysis: | ~                          |     |                             |



# Ground Gas and Water Monitoring Certificate



Site: Aldi, Hetton Le Hole  
 Project No. P18-474  
 Date: 08.03.2023

| Borehole  | Gas Flow (l/hr) |        | Time | Atmospheric Pressure (mB) | Methane (%v/v) |        | Methane (% LEL*) |        | Carbon Dioxide (%v/v) |        | Oxygen (%v/v) |        | Other Gases (ppm) |     |     | Depth to Water (mBGL) |
|---|-----------------|--------|------|---------------------------|----------------|--------|------------------|--------|-----------------------|--------|---------------|--------|-------------------|-----|-----|-----------------------|
|   | Initial         | Steady |      |                           | Initial        | Steady | Initial          | Steady | Initial               | Steady | Initial       | Steady | PID               | H2S | CO  |                       |
| WS03  | <0.1            | <0.1   | -    | 0988                      | 0.0            | 0.1    | 000              | 000    | 6.9                   | 6.9    | 12.8          | 12.8   | 0.2               | 0.0 | 0.0 | 2.7                   |
| WS02  | <0.1            | <0.1   | -    | 0988                      | 0.0            | 0.2    | 000              | 000    | 3.0                   | 3.0    | 17.7          | 17.7   | 0.2               | 0.0 | 0.0 | 2.45                  |
| WS01  | <0.1            | <0.1   | -    | 0988                      | 0.0            | 0.3    | 000              | 000    | 0.0                   | 0.1    | 21.5          | 21.5   | 0.3               | 0.0 | 0.0 | 1.97                  |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|   |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
| <p><b>Notes:</b><br/>                     Monitoring should be for <b>not less</b> than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes<br/>                     * LEL = Lower Explosive Limit = 5%v/v. mBGL = metres Below Ground Level.</p> |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |

| Relevant Information At Time Of Monitoring |                            |     |                             |
|--|----------------------------|-----|-----------------------------|
| Monitored by:                              | KRC                        |     |                             |
| Atmospheric Pressure (mB):                 | 0988                       |     |                             |
| Weather:                                   | snow                       |     |                             |
| Atmospheric Pressure Trend:                | Falling                    |     |                             |
| Equipment Used:                            | Infra-red Gas Analyser     | Yes | Last calibrated: 23.06.2022 |
|  | Mass Balance Transducer    | ~   | Last calibrated: ~          |
|  | Tiger PID                  | ~   | Last calibrated: ~          |
| Visible Signs of Vegetation Stress:        | None of significance noted |     |                             |
| Other Comments / Observations:             | ~                          |     |                             |
| Boreholes Sampled For Laboratory Analysis: | ~                          |     |                             |

# Ground Gas and Water Monitoring Certificate



**Site:** Aldi, Hetton Le Hole  
**Project No.** P18-474  
**Date:** 31.03.2023

| Borehole   | Gas Flow (l/hr) |        | Time | Atmospheric Pressure (mB) | Methane (%v/v) |        | Methane (% LEL*) |        | Carbon Dioxide (%v/v) |        | Oxygen (%v/v) |        | Other Gases (ppm) |     |     | Depth to Water (mBGL) |
|--|-----------------|--------|------|---------------------------|----------------|--------|------------------|--------|-----------------------|--------|---------------|--------|-------------------|-----|-----|-----------------------|
|  | Initial         | Steady |      |                           | Initial        | Steady | Initial          | Steady | Initial               | Steady | Initial       | Steady | PID               | H2S | CO  |                       |
| WS03   | <0.1            | <0.1   | -    | 0986                      | 0.0            | 0.1    | 000              | 000    | 6.3                   | 6.3    | 12.3          | 12.3   | 0.1               | 0.0 | 0.0 | 2.74                  |
| WS02   | <0.1            | <0.1   | -    | 0986                      | 0.0            | 0.1    | 000              | 000    | 2.8                   | 2.8    | 20.2          | 20.2   | 0.1               | 0.0 | 0.0 | 2.40                  |
| WS01   | <0.1            | <0.1   | -    | 0986                      | 0.0            | 0.1    | 000              | 000    | 0.3                   | 0.3    | 20.1          | 20.1   | 0.2               | 0.0 | 0.0 | 1.93                  |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|  |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
| <b>Notes:</b><br>Monitoring should be for <b>not less</b> than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes<br>* LEL = Lower Explosive Limit = 5%v/v. mBGL = metres Below Ground Level. |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |

| Relevant Information At Time Of Monitoring        |                            |     |                                    |
|---|----------------------------|-----|------------------------------------|
| <b>Monitored by:</b>                              | KRC                        |     |                                    |
| <b>Atmospheric Pressure (mB):</b>                 | 0986                       |     |                                    |
| <b>Weather:</b>                                   | sunny                      |     |                                    |
| <b>Atmospheric Pressure Trend:</b>                | Rising                     |     |                                    |
| <b>Equipment Used:</b>                            | Infra-red Gas Analyser     | Yes | <b>Last calibrated:</b> 23.06.2022 |
|   | Mass Balance Transducer    | ~   | <b>Last calibrated:</b> ~          |
|   | Tiger PID                  | ~   | <b>Last calibrated:</b> ~          |
| <b>Visible Signs of Vegetation Stress:</b>        | None of significance noted |     |                                    |
| <b>Other Comments / Observations:</b>             | ~                          |     |                                    |
| <b>Boreholes Sampled For Laboratory Analysis:</b> | ~                          |     |                                    |

**Ground Gas and Water Monitoring Certificate**



Site: Aldi, Hetton Le Hole  
 Project No. P18-474  
 Date: 27.04.2023

| Borehole | Gas Flow (l/hr) |        | Time | Atmospheric Pressure (mB) | Methane (%v/v) |        | Methane (% LEL*) |        | Carbon Dioxide (%v/v) |        | Oxygen (%v/v) |        | Other Gases (ppm) |     |     | Depth to Water (mBGL) |
|----------|-----------------|--------|------|---------------------------|----------------|--------|------------------|--------|-----------------------|--------|---------------|--------|-------------------|-----|-----|-----------------------|
|          | Initial         | Steady |      |                           | Initial        | Steady | Initial          | Steady | Initial               | Steady | Initial       | Steady | PID               | H2S | CO  |                       |
| WS03     | <0.1            | <0.1   | -    | 1006                      | 0.1            | 0.1    | 000              | 000    | 0.1                   | 0.1    | 21.2          | 21.2   | 0.2               | 0.0 | 0.0 | 2.63                  |
| WS02     | <0.1            | <0.1   | -    | 1006                      | 0.1            | 0.1    | 000              | 000    | 2.7                   | 2.7    | 17.0          | 17.0   | 0.1               | 0.0 | 0.0 | 2.12                  |
| WS01     | <0.1            | <0.1   | -    | 1006                      | 0.1            | 0.1    | 000              | 000    | 1.8                   | 1.8    | 18.7          | 18.7   | 0.0               | 0.0 | 0.0 | 1.80                  |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |

**Notes:**  
 Monitoring should be for **not less** than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes  
 \* LEL = Lower Explosive Limit = 5%v/v. mBGL = metres Below Ground Level.

| Relevant Information At Time Of Monitoring        |                            |     |                                    |
|---|----------------------------|-----|------------------------------------|
| <b>Monitored by:</b>                              | KRC                        |     |                                    |
| <b>Atmospheric Pressure (mB):</b>                 | 1006                       |     |                                    |
| <b>Weather:</b>                                   | overcast                   |     |                                    |
| <b>Atmospheric Pressure Trend:</b>                | Falling                    |     |                                    |
| <b>Equipment Used:</b>                            | Infra-red Gas Analyser     | Yes | <b>Last calibrated:</b> 23.06.2022 |
|   | Mass Balance Transducer    | ~   | <b>Last calibrated:</b> ~          |
|   | Tiger PID                  | ~   | <b>Last calibrated:</b> ~          |
| <b>Visible Signs of Vegetation Stress:</b>        | None of significance noted |     |                                    |
| <b>Other Comments / Observations:</b>             | ~                          |     |                                    |
| <b>Boreholes Sampled For Laboratory Analysis:</b> | ~                          |     |                                    |

# Ground Gas and Water Monitoring Certificate



**Site:** Aldi, Hetton Le Hole  
**Project No.** P18-474  
**Date:** 02.05.2023

| Borehole | Gas Flow (l/hr) |        | Time | Atmospheric Pressure (mB) | Methane (%v/v) |        | Methane (% LEL*) |        | Carbon Dioxide (%v/v) |        | Oxygen (%v/v) |        | Other Gases (ppm) |     |     | Depth to Water (mBGL) |
|----------|-----------------|--------|------|---------------------------|----------------|--------|------------------|--------|-----------------------|--------|---------------|--------|-------------------|-----|-----|-----------------------|
|          | Initial         | Steady |      |                           | Initial        | Steady | Initial          | Steady | Initial               | Steady | Initial       | Steady | PID               | H2S | CO  |                       |
| WS03     | <0.1            | <0.1   | -    | 1020                      | 0.1            | 0.1    | 000              | 000    | 0.1                   | 0.1    | 21.1          | 21.1   | 0.1               | 0.0 | 0.0 | 2.56                  |
| WS02     | <0.1            | <0.1   | -    | 1020                      | 0.1            | 0.1    | 000              | 000    | 2.7                   | 2.7    | 17.5          | 17.5   | 0.0               | 0.0 | 0.0 | 2.02                  |
| WS01     | <0.1            | <0.1   | -    | 1020                      | 0.1            | 0.1    | 000              | 000    | 1.8                   | 1.8    | 18.8          | 18.8   | 0.1               | 0.0 | 0.0 | 1.75                  |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |
|          |                 |        |      |                           |                |        |                  |        |                       |        |               |        |                   |     |     |                       |

**Notes:**  
 Monitoring should be for **not less** than 3 minutes. However, if high concentrations of gases initially recorded, monitoring should be for up to 10 minutes  
 \* LEL = Lower Explosive Limit = 5%v/v. mBGL = metres Below Ground Level.

| Relevant Information At Time Of Monitoring        |                            |     |                                    |
|---|----------------------------|-----|------------------------------------|
| <b>Monitored by:</b>                              | KRC                        |     |                                    |
| <b>Atmospheric Pressure (mB):</b>                 | 1020                       |     |                                    |
| <b>Weather:</b>                                   | Over cast                  |     |                                    |
| <b>Atmospheric Pressure Trend:</b>                | Rising                     |     |                                    |
| <b>Equipment Used:</b>                            | Infra-red Gas Analyser     | Yes | <b>Last calibrated:</b> 23.06.2022 |
|   | Mass Balance Transducer    | ~   | <b>Last calibrated:</b> ~          |
|   | Tiger PID                  | ~   | <b>Last calibrated:</b> ~          |
| <b>Visible Signs of Vegetation Stress:</b>        | None of significance noted |     |                                    |
| <b>Other Comments / Observations:</b>             | ~                          |     |                                    |
| <b>Boreholes Sampled For Laboratory Analysis:</b> | ~                          |     |                                    |