



**REPORT SDS3285  
JANUARY 2016**

**COMPLETION REPORT FOR THE DRILLING AND GROUTING  
TREATMENT OF MINEWORKINGS**

**at  
QUEENS ROAD, BRYMBO**

**prepared for  
G JONES**



|                       |                                                                                  |                                              |       |
|-----------------------|----------------------------------------------------------------------------------|----------------------------------------------|-------|
| <b>REPORT NUMBER:</b> | SDS3285                                                                          | <b>REPORT STATUS:</b>                        | FINAL |
| <b>REPORT TYPE:</b>   | COMPLETION REPORT FOR THE DRILLING AND GROUTING TREATMENT OF MINEWORKINGS        |                                              |       |
| <b>REPORT DATE:</b>   | JANUARY 2016                                                                     |                                              |       |
| <b>SITE:</b>          | QUEENS ROAD, BRYMBO                                                              |                                              |       |
| <b>PREPARED FOR:</b>  | G JONES                                                                          |                                              |       |
| <b>PREPARED BY:</b>   | Sirius Remediation Ltd<br>4245 Park Approach<br>Thorpe Park<br>Leeds<br>LS15 8GB | Tel: 0113 264 9960<br><br>Fax: 0113 264 9962 |       |

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**COMPLETION REPORT FOR THE DRILLING AND GROUTING TREATMENT OF  
MINEWORKINGS**

**at**

**QUEENS ROAD**

**BRYMBO**

**Prepared for**

**G JONES**

**CONTENTS**

|            |                                          |          |
|------------|------------------------------------------|----------|
| <b>1.</b>  | <b>INTRODUCTION.....</b>                 | <b>1</b> |
| <b>2.</b>  | <b>SITE DETAILS AND DESCRIPTION.....</b> | <b>2</b> |
| 2.1.       | Site Location.....                       | 2        |
| 2.2.       | Site Description .....                   | 2        |
| 2.3.       | Geology .....                            | 2        |
| 2.4.       | Previous Investigations.....             | 3        |
| <b>3.0</b> | <b>DRILLING AND GROUTING WORKS .....</b> | <b>4</b> |
| 3.1        | The Works .....                          | 4        |
| 3.2        | Programme.....                           | 4        |
| 3.3        | Drilling Procedure .....                 | 4        |
| 3.4        | Ground Conditions Encountered .....      | 5        |
| 3.5        | Grouting Procedure .....                 | 5        |
| <b>4.0</b> | <b>Validation .....</b>                  | <b>6</b> |
| <b>5.0</b> | <b>Conclusions.....</b>                  | <b>6</b> |

## **APPENDICES**

### **APPENDIX A FIGURES AND DRAWINGS**

| <b>Drawing No.</b> | <b>Title</b>                      | <b>Scale</b> |
|--------------------|-----------------------------------|--------------|
| SDS3190/CS/01      | Site Location Plan                | 1:25,000     |
| SDS3190/CS/02      | As Built Drilling & Grouting Plan | 1:100        |

### **APPENDIX B COAL AUTHORITY PERMISSION AND MINING REPORT**

### **APPENDIX C DRILLING LOGS, GROUTING LOGS AND SUMMARY TABLE**

### **APPENDIX D CUBE RESULTS, BLEED AND FLOW TEST RESULTS**

## 1. INTRODUCTION

G Jones (the client) is in the process of preparing land at Queens Road, Brymbo, for a proposed residential development with 2 no. plots, associated gardens and driveways. A proposed layout plan is presented within Appendix A as Drawing No. SDS3285/CS/02.

Subsequent to the identification of shallow coal mine workings during previous investigations, undertaken at the site by NKC Geotech Ltd, Sirius Remediation Ltd (Drilling Services) (SDS) was appointed by the client as specialist contractor for the drilling and grouting works.

Prior to the works commencing permission to undertake the pressure grouting of the shallow mine workings within the treatment area was obtained from the Coal Authority (CA), a copy of the permission is presented with Appendix B of this report.

This Completion Report includes the following information:

- A summary of the works undertaken and presentation of the findings.
- Confirmation that the works have been carried out in accordance with the current guidelines.

The principal parties to the contract are:

- |                                                 |                                                 |
|-------------------------------------------------|-------------------------------------------------|
| • G Jones                                       | Client                                          |
| • Sirius Remediation Ltd<br>(Drilling Services) | Subcontractor for mining stabilisation<br>works |

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## 2. SITE DETAILS AND DESCRIPTION

### 2.1. Site Location

The site is located, off Queens Road, Brymbo, approx. 5.2 km north west of Wrexham at an approximate National Grid Reference of NGR 329768, 353864

A site location plan is included as Drawing No. SDS3285/CS/01 within Appendix A.

### 2.2. Site Description

The site area is irregular in shape and occupies an area of approx. 830m<sup>2</sup>. Historically the site was steep unmanaged grassland occupied only by a garage at road. At the time of works the site had been terraced with gabion and blockwork retaining wall. The treatment area occupies an area of approximately 300m<sup>2</sup> below the two proposed plots.

### 2.3. Geology

A summary of available published geological information is provided in Table 2.1.

**Table 2.1 Geological Summary**

|                                        |                                                                                                                                                                                                                                                                   |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sources of Information</b>          | NKC Geotech Ltd – Mining Investigation Report                                                                                                                                                                                                                     |
| <b>Superficial Geology/Made Ground</b> | Brown clay and grey shale                                                                                                                                                                                                                                         |
| <b>Solid Geology</b>                   | Carboniferous Westphalian rocks that form the North Wales Coalfield, dipping to the east at 1 in 7. These rocks are predominately shales and sandstones containing coal seams up to 3.0m in thickness at vertical intervals typically varying from 4.0m to 20.0m. |

|                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mining and Quarrying</b> | <p>The Geological Survey, confirmed by the workings of Holland Colliery 200m north of the site in 1940, show the following coal seams in descending order close to the surface in the vicinity:</p> <p>Powell Coal – 1.2m thick</p> <p>Two Yard Coal – 2.1m thick</p> <p>Crank Coal – 1.0m thick</p> <p>There are plans of mineworkings immediately adjacent to the site in the Main Coal seam at a depth of 90m. There are no plans of any mining shallower than the Main Coal.</p> |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

## 2.4. Previous Investigations

The site has been subject to a previous mining investigation by NKC Geotech Ltd (NKC), as noted below.

- *NKC Geotech Ltd, Mining Investigation Report, Queens Road Brymbo, Report Ref. 1415, dated August 2015.*

### Summary of Relevant Findings

Within their report, NKC concluded the following in relation to the conjectured three coal seams below the site ...

*“The outcrop of the overlying Powell Coal is present immediately east of Plot 2 and was visible during the construction of the gabion wall.*

*The investigation boreholes found collapsed pillar and stall workings in the Two Yard Coal at 10.4m under Plot 2 and solid coal at this horizon from 6.9m to 8.7m under Plot 1.*

*Open voids in the Crank Coal were encountered at 25.5m and 27.5m in the boreholes. These workings lie too deep to affect surface stability.*

*The mineworkings must be stabilised by grouting to prevent further void migration under the proposed dwellings by grouting the Two Yard Coal workings.”*

### **3.0 DRILLING AND GROUTING WORKS**

#### **3.1 The Works**

The previous site investigation works formed the basis of the works undertaken at the site. The reports identified a worked coal seam, likely to be the Two Yard Coal seam, at depths of up to 10.40m below ground level.

Within the areas of the site affected by shallow workings, the intention of the works was to stabilise the building footprints extending up to 3m beyond.

In accordance with the specification, Sirius have utilised a phased approach to the works at the site, with treatment based on the ground conditions encountered. A primary staggered 6.0m x 6.0m primary grid was drilled and additional secondary boreholes were drilled around any primary borehole exhibiting evidence of shallow mineworkings to form a 3.0m x 3.0m grid.

The stabilisation works were undertaken by injecting a PFA / cement grout into the boreholes.

#### **3.2 Programme**

The programme of investigation and treatment works were carried out as a continuous operation from the 16<sup>th</sup> November 2015 to the 19<sup>th</sup> November 2015.

#### **3.3 Drilling Procedure**

Boreholes were drilled using open hole rotary percussive drilling rigs with water flush. Each hole was extended to base of the coal seam or the base of the workings if apparent. A further minimum 1.0m thickness of solid strata was then penetrated in order to prove competent rock.

Throughout the treatment area, boreholes / grout injection points were drilled in accordance with the layout as shown on Drawing No SDS3285/CS/02 within Appendix A.

The ground conditions encountered in each borehole are detailed within SDS's daily drill log sheets, included within Appendix C of this report.

### **3.4 Ground Conditions Encountered**

A total of 33 boreholes were drilled amounting to a total of 419.90 of drilling. The borehole locations and strata encountered are recorded on Drawing No SDS3285/CS/02.

The rotary probe holes typically encountered intact coal or evidence of workings at depths of between 5.50m and 11.20m bgl, the coal was found in two leaves in places. The thickness of the soft and broken strata encountered in places is indicative of migrated workings

- Solid Coal (inc weak coal) was encountered in 29 holes (approx. 88%)
- Broken Ground was encountered in 3 holes (approx. 9%)
- Soft Push was encountered in 1 holes (approx. 3%)

### **3.5 Grouting Procedure**

Boreholes were injected with a grout comprising a 12:1 ratio mixture of Pulverised Fuel Ash (PFA) and Ordinary Portland Cement (OPC) respectively with 40 to 45% water.

Grout was injected into all boreholes utilising a tremie pipe placed to the base of each hole. Grout was injected under static head until grout appeared at the surface.

A total of 14.43 tonnes of grout was injected into these boreholes with the grout acceptance varying between 0.13 tonnes to 3.90 tonnes with an arithmetical average of 0.44 tonnes per hole.

## 4.0 Validation

In order to assess the standard of the stabilisation works undertaken, a total of two test boreholes were drilled in selected locations within the treatment area. The locations are shown on Drawing No. SDS3285/CS/02 within Appendix A.

The locations of the test boreholes were selected with the emphasis on areas of workings, as well as to provide general coverage of the treated area.

The efficiency of the treatment works was assessed using grout injection tests in each of the test holes under a constant pressure of up to a maximum of 200kN/m<sup>2</sup>. This pressure was maintained for a period of 5 minutes, after which the recorded drop in pressure was found to be less than 10%. On this basis the treatment was considered satisfactory, with substantial filling of workings.

Bleed tests and flow tests on the grout were carried out regularly during the grouting works, with bleed tests being undertaken over a 6 hour test period with bleed capacities recorded as being below the maximum 5%, as detailed within the specification. Flow tests recorded grout flowability readings between 380 and 450mm, using a 'Colcrete' meter, in accordance with guidance contained within the specification. The results of these tests are presented within Appendix D of this report.

In order to determine the compressive strength of infill grout, test cubes were formed on site at a frequency of 6 (No.) grout cubes per week, and subject to testing by Environmental Scientifics Group Ltd, based in Warrington, a UKAS accredited laboratory.

Grout cubes were scheduled to be crushed at 7 and 28 day intervals in accordance with BS 1881. The results of testing are presented within Appendix D of this report. The 28 days result obtained are 5.7 and 5.9 MN/m<sup>2</sup> which are well above the 0.7MN/m<sup>2</sup> required.

## 5.0 Conclusions

The site observations, drilling and grouting records, and test boreholes indicate that the drilling and grouting works have been carried out to a satisfactory standard in accordance with industry methodologies; in particular CIRIA SP 32.



# APPENDIX A

## FIGURES AND DRAWINGS



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#### NOTES

 Site Location

#### REVISION

|   |                 |
|---|-----------------|
| D | For Information |
| A | >>              |
| B | >>              |
| C | >>              |
| D | >>              |

SIRIUS REMEDIATION LTD  
4245 Park Approach  
Thorpe Park  
Leeds  
LS15 8GB  
[www.siriusgroup.com](http://www.siriusgroup.com)  
TEL: 0113 2649960  
FAX: 0113 2649962



#### CLIENT

G JONES

#### SITE

QUEENS ROAD  
BRYMBO

#### DRAWING TITLE

SITE LOCATION  
PLAN

#### DRAWING NO.

SDS3285-CS-01

#### DRAWN BY

JCC

#### DATE

Dec15

#### REVISION NO.

0

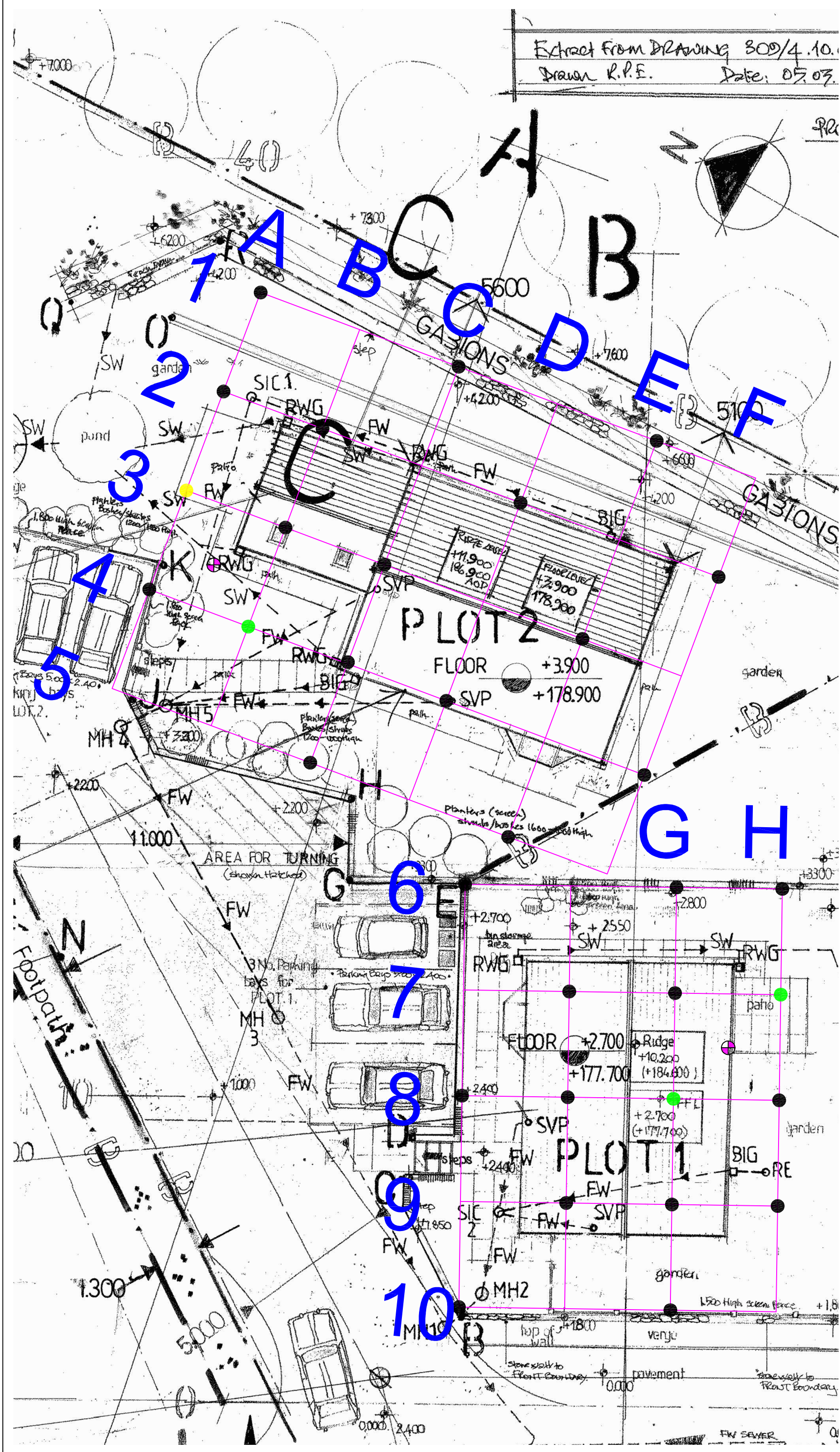
#### APPROVED BY

AGT

#### SCALE

1:25,000

A4



**NOTES**

- Coal
- Broken Ground
- Soft
- ⊕ Test Borehole

Development layout taken from R.P Edwards Drawing No. 309/4.03.015

| REVISION |    |
|----------|----|
| 0        | >> |
| A        | >> |
| B        | >> |
| C        | >> |
| D        | >> |

**SIRIUS**  
REMEDIATION LTD  
4245 Park Approach,  
Thorpe Park,  
Leeds  
LS15 8GB  
[www.the-siriusgroup.com](http://www.the-siriusgroup.com)  
TEL: 0113 264 9960  
FAX: 0113 264 9962

**CLIENT**  
  
**GJONES**

**SITE**  
**QUEENS ROAD**  
**BRYMBO**

**DRAWING TITLE**  
**AS BUILT DRILL**  
**AND GROUT PLAN**

|                                     |                           |
|-------------------------------------|---------------------------|
| <b>DRAWING NO.</b><br>SDS3285/CA/02 | <b>REVISION NO.</b><br>>> |
| <b>DRAWN BY</b><br>JCC              | <b>APPROVED BY</b><br>AGT |
| <b>DATE</b><br>DEC 2015             | <b>SCALE</b><br>1:100     |
| <b>PAPER SIZE</b><br>A3             |                           |





## APPENDIX B

# COAL AUTHORITY PERMISSION



The Coal  
Authority

Permit Reference Number 11564

## Permit to Enter or Disturb Coal Authority Mining Interests

**Name and Address of Permit Holder:**

Gillian Jones  
10 Malvern Park  
Pendine Park  
Gwersyllt  
WREXHAM  
LL11 4XG

**Site Location:**

Land off  
Queens Road  
Brymbo  
Wrexham  
LL11 5DY

**This certificate hereby grants the above named Permit Holder a Permit to carry out :-**

***Treatment of Mine Workings*** within the Authority's mining interests at the identified site location for the period of 12 months from the effective date shown below. The granting of this Permit does not constitute advice given by the Authority in relation to the proposed operations. It is the Applicant's responsibility to obtain appropriate health, safety, environmental, technical and legal advice.

Signed:

Effective Date: 11<sup>th</sup> November 2015.....

For and on behalf of the Head of Regulation, The Coal Authority

***Nominated Representative: Toni R. Lane, Permitting Manager;***

***The Coal Authority, Permitting Office, 200 Lichfield Lane, Mansfield, Notts, NG18 4RG***

***Tel: 01623 637339; E-Mail: [permissions@coal.gov.uk](mailto:permissions@coal.gov.uk)***

## Site Location

### Overview map





## APPENDIX C

# DRILLING LOGS, GROUTING LOGS AND SUMMARY TABLE

SDS3285 Queens Road, Brymbo  
Drill Grout Summary

| Borehole ID | Drilled by | Date Drilled | Superficials | Upper Leaf | From (m bgl) | To (m bgl) | Thickness (m) | Lower Leaf | From (m bgl) | To (m bgl) | Thickness (m) | BH Depth (m bgl) | Grout Take (T) | Comments   |
|-------------|------------|--------------|--------------|------------|--------------|------------|---------------|------------|--------------|------------|---------------|------------------|----------------|------------|
| A01         | Ri Edwards | 18/11/2015   | 1.60         |            |              |            |               | C          | 10.80        | 12.50      | 1.70          | 13.50            | 0.13           |            |
| A02         | Ri Edwards | 19/11/2015   | 1.80         |            |              |            |               | C          | 10.50        | 12.00      | 1.50          | 13.00            | 0.13           |            |
| A03         | Ri Edwards | 17/11/2015   | 1.80         |            |              |            |               | S          | 10.00        | 12.30      | 2.30          | 13.30            | 3.90           |            |
| A04         | Ri Edwards | 18/11/2015   | 1.50         |            |              |            |               | C          | 10.40        | 12.20      | 1.80          | 13.20            | 0.13           |            |
| B02         | Ri Edwards | 18/11/2015   | 1.50         |            |              |            |               | C          | 10.50        | 12.20      | 1.70          | 13.20            | 0.13           |            |
| B03         | Ri Edwards | 17/11/2015   | 1.80         |            |              |            |               | C          | 10.50        | 12.00      | 1.50          | 13.00            | 0.13           |            |
| B04         | Ri Edwards | 17/11/2015   | 3.00         |            |              |            |               | B/G        | 9.00         | 12.00      | 3.00          | 13.00            | 2.60           |            |
| C01         | Ri Edwards | 18/11/2015   | 1.60         |            |              |            |               | C          | 11.00        | 12.70      | 1.70          | 13.70            | 0.13           |            |
| C03         | Ri Edwards | 19/11/2015   | 1.80         |            |              |            |               | C          | 10.70        | 12.20      | 1.50          | 13.20            | 0.13           |            |
| C04         | Ri Edwards | 17/11/2015   | 3.00         |            |              |            |               | C          | 11.00        | 12.40      | 1.40          | 13.40            | 0.13           |            |
| C05         | Ri Edwards | 17/11/2015   | 3.20         |            |              |            |               | C          | 11.20        | 12.50      | 1.30          | 13.50            | 0.13           | Angled     |
| D02         | Ri Edwards | 19/11/2015   | 1.50         |            |              |            |               | C          | 10.70        | 12.50      | 1.80          | 13.50            | 0.13           |            |
| D04         | Ri Edwards | 17/11/2015   | 3.00         |            |              |            |               | C          | 11.00        | 12.60      | 1.60          | 13.60            | 0.13           |            |
| E01         | Ri Edwards | 19/11/2015   | 1.80         |            |              |            |               | C          | 11.00        | 12.70      | 1.70          | 13.70            | 0.13           | Angled     |
| E03         | Ri Edwards | 19/11/2015   | 2.00         |            |              |            |               | C          | 10.50        | 12.20      | 1.70          | 13.20            | 0.13           |            |
| E05         | Ri Edwards | 17/11/2015   | 3.00         |            |              |            |               | C          | 10.80        | 12.40      | 1.60          | 13.40            | 0.13           | 16 degrees |
| E06         | Ri Edwards | 16/11/2015   | 4.80         | C          | 7.00         | 9.20       | 2.20          | C          | 10.20        | 10.40      | 0.20          | 12.00            | 0.13           | Angled     |
| E08         | Ri Edwards | 16/11/2015   | 5.00         | C          | 7.00         | 9.00       | 2.00          | C          | 10.00        | 10.50      | 0.50          | 12.00            | 0.13           |            |
| E10         | Ri Edwards | 16/11/2015   | 5.00         | C          | 6.00         | 8.00       | 2.00          | C          | 10.00        | 10.30      | 0.30          | 12.00            | 0.13           | Angled     |
| F02         | Ri Edwards | 19/11/2015   | 1.50         |            |              |            |               | C          | 10.80        | 12.50      | 1.70          | 13.50            | 0.13           |            |
| F04         | Ri Edwards | 17/11/2015   | 3.50         |            |              |            |               | C          | 10.40        | 11.80      | 1.40          | 12.80            | 0.13           |            |
| F07         | Ri Edwards | 16/11/2015   | 4.50         | C          | 7.00         | 9.00       | 2.00          | C          | 10.00        | 10.30      | 0.30          | 12.00            | 0.13           |            |
| F08         | Ri Edwards | 16/11/2015   | 4.50         | C          | 7.00         | 9.00       | 2.00          | C          | 10.20        | 10.50      | 0.30          | 12.00            | 0.13           |            |
| F09         | Ri Edwards | 16/11/2015   | 5.00         | C          | 5.50         | 7.50       | 2.00          |            |              |            |               | 15.00            | 0.13           |            |
| G06         | Ri Edwards | 16/11/2015   | 4.50         | C          | 7.80         | 10.00      | 2.20          | C          | 11.20        | 11.40      | 0.20          | 13.00            | 0.13           | Angled     |
| G07         | Ri Edwards | 16/11/2015   | 4.80         | C          | 7.50         | 9.50       | 2.00          | C          | 10.60        | 11.00      | 0.40          | 12.00            | 0.13           |            |
| G08         | Ri Edwards | 16/11/2015   | 4.70         | B/G        | 6.50         | 9.50       | 3.00          |            |              |            |               | 10.50            | 3.25           |            |
| G09         | Ri Edwards | 16/11/2015   | 5.00         | C          | 6.50         | 8.50       | 2.00          | C          | 9.60         | 10.00      | 0.40          | 11.00            | 0.13           |            |
| G10         | Ri Edwards | 16/11/2015   | 4.80         | C          | 6.50         | 8.80       | 2.30          | C          | 10.00        | 10.50      | 0.50          | 12.00            | 0.13           | Angled     |
| H06         | Ri Edwards | 17/11/2015   | 3.00         |            |              |            |               | C          | 10.50        | 12.00      | 1.50          | 13.00            | 0.13           |            |
| H07         | Ri Edwards | 16/11/2015   | 4.50         | B/G        | 5.50         | 9.50       | 4.00          |            |              |            |               | 10.50            | 0.91           |            |
| H08         | Ri Edwards | 16/11/2015   | 5.00         | C          | 7.00         | 9.00       | 2.00          | C          | 9.80         | 10.20      | 0.40          | 11.20            | 0.13           |            |
| H09         | Ri Edwards | 16/11/2015   | 5.00         | C          | 6.00         | 8.00       | 2.00          | C          | 9.70         | 10.00      | 0.30          | 12.00            | 0.13           |            |
|             |            |              |              |            |              |            |               |            |              |            |               | Total            | 419.90         | 14.43      |

SDS3285 Queens Road, Brymbo  
Drill Grout Summary

Test Boreholes

| Borehole ID | Drilled By | Date Drilled | Superficials | Strata | From<br>(m bgl) | To<br>(m bgl) | Thickness<br>(m) | BH Depth<br>(m bgl) | Grout Take<br>(T) | Comments   |
|-------------|------------|--------------|--------------|--------|-----------------|---------------|------------------|---------------------|-------------------|------------|
| A/B 3/4     | Ri Edwards | 19/11/2015   | 2.50         | S/G    | 9.80            | 12.50         | 2.70             | 13.50               | 0.13              | Soft grout |
| G/H 7/8     | Ri Edwards | 19/11/2015   | 4.50         | S/G    | 6.00            | 9.50          | 3.50             | 10.50               | 0.13              | Soft grout |
| Totals      |            |              |              |        |                 |               |                  | 24.00               | 0.26              |            |

Key

|     |               |
|-----|---------------|
| C   | Coal          |
| S   | Soft          |
| BG  | Broken Ground |
| S/G | Soft Grout    |



## DRILLING LOGS



Remediation

## OPENHOLE DRILL LOG

4245 Park Approach, Thorpe Park, Leeds, LS15 8GB

Tel: 0113 264 9960

Fax: 0113 264 9962

Job No. SPS 3285

Contract Name: Brymbo

Rig Type: C6

Date: 16<sup>th</sup> NOVEMBER

Client: Mrs JONES

Crew Details: R. Edwards

Sheet: 1 of: 2

Working Day No. MONDAY

M Green

| BH         | From | To   | Strata Description | BH        | From | To   | Strata Description |
|------------|------|------|--------------------|-----------|------|------|--------------------|
| F9         | Gz   | 5.0  | Overburden         | E8        | Gz   | 5.0  | Overburden         |
|            | 5.0  | 5.5  | Mudstone           |           | 5.0  | 7.0  | Mudstone           |
|            | 5.5  | 7.5  | Coal               |           | 7.0  | 9.0  | Coal               |
|            | 7.5  | 15.0 | Sandstone          |           | 9.0  | 10.0 | Sandstone          |
| H9         | Gz   | 5.0  | Overburden         | E6 ANGLED | 10.0 | 10.5 | Coal               |
|            | 5.0  | 6.0  | Mudstone           |           | 10.5 | 12.0 | Sandstone          |
|            | 6.0  | 8.0  | Coal               |           |      |      |                    |
|            | 8.0  | 9.7  | Sandstone          |           | Gz   | 4.8  | Overburden         |
|            | 9.7  | 10.0 | Coal               |           | 4.8  | 7.3  | Mudstone           |
|            | 10.0 | 12.0 | Sandstone          |           | 7.3  | 9.2  | Coal               |
| G10 ANGLED |      |      |                    | F7        | 9.2  | 10.2 | Sandstone          |
|            | Gz   | 4.8  | Overburden         |           | 10.2 | 10.4 | Coal               |
|            | 4.8  | 6.5  | Mudstone           |           | 10.4 | 12.0 | Sandstone          |
|            | 6.5  | 8.8  | Coal               |           |      |      |                    |
|            | 8.8  | 10.0 | Sandstone          |           | Gz   | 4.5  | Overburden         |
|            | 10.0 | 10.5 | Coal               |           | 4.5  | 7.0  | Mudstone           |
| E10 ANGLED | 10.5 | 12.0 | Sandstone          | G8        | 7.0  | 9.0  | Coal               |
|            |      |      |                    |           | 9.0  | 10.0 | Sandstone          |
|            | Gz   | 5.0  | Overburden         |           | 10.0 | 10.3 | Coal               |
|            | 5.0  | 6.0  | Mudstone           |           | 10.3 | 12.0 | Sandstone          |
|            | 6.0  | 8.0  | Coal               |           |      |      |                    |
|            | 8.0  | 10.0 | Sandstone          |           | Gz   | 4.7  | Overburden         |
|            | 10.0 | 10.3 | Coal               |           | 4.7  | 6.5  | Mudstone           |
|            | 10.3 | 12.0 | Sandstone          |           | 6.5  | 9.5  | Broken Gravel      |
|            |      |      |                    |           | 9.5  | 10.5 | Socio              |
|            |      |      |                    |           |      |      |                    |

| Remarks                                                     | Totals   | Boreholes | Drilled | Cased |
|-------------------------------------------------------------|----------|-----------|---------|-------|
|                                                             | Today    |           |         |       |
| Signed by<br>Sirius Remediation Ltd<br>(Drilling Division): | Previous |           |         |       |
| Date:                                                       | To Date  |           |         |       |
| Signed<br>by Client:                                        |          |           |         |       |
| Date:                                                       |          |           |         |       |



Remediation

## OPENHOLE DRILL LOG

4245 Park Approach, Thorpe Park, Leeds, LS15 8GB

Tel: 0113 264 9960

Fax: 0113 264 9962

Job No. SOS 3285 Contract Name: Brymbo Rig Type: C6  
 Date: 16<sup>th</sup> November Client: Mrs Jones Crew Details: R EDWARDS  
 Sheet: 2 of: 2 Working Day No. Monday M Green

| BH        | From | To   | Strata Description | BH | From | To   | Strata Description |
|-----------|------|------|--------------------|----|------|------|--------------------|
| H7        | Gz   | 4.5  | Overburden         | G7 | Gz   | 4.8  | Overburden         |
|           | 4.5  | 5.5  | Mudstone           |    | 4.8  | 7.5  | Mudstone           |
|           | 5.5  | 9.5  | Broken Gravel      |    | 7.5  | 9.5  | Coal               |
|           | 9.5  | 10.5 | Solid              |    | 9.5  | 10.6 | Sandstone          |
|           |      |      |                    |    | 10.6 | 11.0 | Coal               |
|           |      |      |                    |    | 11.0 | 12.0 | Mudstone           |
| G6 ANGLED |      |      |                    |    |      |      |                    |
|           | Gz   | 4.5  | Overburden         |    |      |      |                    |
|           | 4.5  | 7.8  | Mudstone           | H8 | Gz   | 5.0  | Overburden         |
|           | 7.8  | 10.0 | Coal               |    | 5.0  | 7.0  | Mudstone           |
|           | 10.0 | 11.2 | Sandstone          |    | 7.0  | 9.0  | Coal               |
|           | 11.2 | 11.4 | Coal               |    | 9.0  | 9.8  | Mudstone           |
|           | 11.4 | 13.0 | Sandstone          |    | 9.8  | 10.2 | Coal               |
|           |      |      |                    |    | 10.2 | 11.2 | Mudstone           |
| F8        | Gz   | 4.5  | Overburden         |    |      |      | Sandstone          |
|           | 4.5  | 7.0  | Mudstone           |    |      |      |                    |
|           | 7.0  | 9.0  | Coal               |    |      |      |                    |
|           | 9.0  | 10.2 | Sandstone          |    |      |      |                    |
|           | 10.2 | 10.5 | Coal               |    |      |      |                    |
|           | 10.5 | 12.0 | Sandstone          |    |      |      |                    |
|           |      |      |                    |    |      |      |                    |
| G9        | Gz   | 5.0  | Overburden         |    |      |      |                    |
|           | 5.0  | 6.5  | Mudstone           |    |      |      |                    |
|           | 6.5  | 8.5  | Coal               |    |      |      |                    |
|           | 8.5  | 9.6  | Sandstone          |    |      |      |                    |
|           | 9.6  | 10.0 | Coal               |    |      |      |                    |
|           | 10.0 | 11.0 | Mudstone           |    |      |      |                    |
|           |      |      | Sandstone          |    |      |      |                    |

| Remarks                                                     | Totals   | Boreholes | Drilled | Cased |
|-------------------------------------------------------------|----------|-----------|---------|-------|
|                                                             | Today    | 14        | 167.2   |       |
| Signed by<br>Sirius Remediation Ltd<br>(Drilling Division): | Previous | ✓         |         |       |
| Date:                                                       | To Date  | 14        | 167.2   |       |
| Signed<br>by Client:                                        |          |           |         |       |
| Date:                                                       |          |           |         |       |



Remediation

# OPENHOLE DRILL LOG

4245 Park Approach, Thorpe Park, Leeds, LS15 8GB

Tel: 0113 264 9960

Fax: 0113 264 9962

Job No. SDS 3285 Contract Name: Brymbo Rig Type: C6  
 Date: 17<sup>th</sup> NOVEMBER Client: Mrs JONES Crew Details: R Edwards  
 Sheet: 1 of: 1 Working Day No. Tuesday M Green

| BH                 | From | To   | Strata Description   | BH | From | To   | Strata Description   |
|--------------------|------|------|----------------------|----|------|------|----------------------|
| 146                | GZ   | 3.0  | Overburden           | B4 | GZ   | 3.0  | Overburden           |
|                    | 3.0  | 10.5 | Sandstone / Mudstone |    | 3.0  | 9.0  | Sandstone / Mudstone |
|                    | 10.5 | 12.0 | Coal                 |    | 9.0  | 12.0 | Broken Ground        |
|                    | 12.0 | 13.0 | Mudstone             |    | 12.0 | 13.0 | Socio                |
| F4                 | GZ   | 3.5  | Overburden           | C4 | GZ   | 3.0  | Overburden           |
|                    | 3.5  | 10.4 | Sandstone / Mudstone |    | 3.0  | 11.0 | Sandstone / Mudstone |
|                    | 10.4 | 11.8 | Coal                 |    | 11.0 | 12.4 | Coal                 |
|                    | 11.8 | 12.8 | Mudstone             |    | 12.4 | 13.4 | Mudstone             |
| E5/16 <sup>0</sup> | GZ   | 3.0  | Overburden           | A3 | GZ   | 1.8  | Overburden           |
|                    | 3.0  | 10.8 | Sandstone / Mudstone |    | 1.8  | 10.0 | Sandstone / Mudstone |
|                    | 10.8 | 12.4 | Coal                 |    | 10.0 | 12.3 | Soft                 |
|                    | 12.4 | 13.4 | Mudstone             |    | 12.3 | 13.3 | Socio                |
| D4                 | GZ   | 3.0  | Overburden           | B3 | GZ   | 1.8  | Overburden           |
|                    | 3.0  | 11.0 | Sandstone / Mudstone |    | 1.8  | 10.5 | Sandstone / Mudstone |
|                    | 11.0 | 12.6 | Coal                 |    | 10.5 | 12.0 | Coal                 |
|                    | 12.6 | 13.6 | Mudstone             |    | 12.0 | 13.0 | Mudstone             |
| C5 ANGELED         |      |      |                      |    |      |      |                      |
|                    | GZ   | 3.2  | Overburden           |    |      |      |                      |
|                    | 3.2  | 11.2 | Sandstone / Mudstone |    |      |      |                      |
|                    | 11.2 | 12.5 | Coal                 |    |      |      |                      |
|                    | 12.5 | 13.5 | Mudstone             |    |      |      |                      |

| Remarks                                                                                              | Totals   | Boreholes | Drilled | Cased |
|------------------------------------------------------------------------------------------------------|----------|-----------|---------|-------|
|                                                                                                      | Today    | 9         | 119.0   |       |
| Signed by<br>Sirius Remediation Ltd<br>(Drilling Division): <u>[Signature]</u> Date: <u>17/11/15</u> | Previous | 14        | 167.2   |       |
| Signed<br>by Client: _____ Date: _____                                                               | To Date  | 23        | 286.2   |       |



Remediation

## OPENHOLE DRILL LOG

4245 Park Approach, Thorpe Park, Leeds, LS15 8GB

Tel: 0113 264 9960

Fax: 0113 264 9962

Job No: GDS 3285 Contract Name: Brymbo Rig Type: CG  
Date: 18<sup>th</sup> November Client: Max Jones Crew Details: REDWATERS  
Sheet: 1 of: 1 Working Day No. WEDNESDAY M Green

| BH | From    | To   | Strata Description   | BH | From | To | Strata Description |
|----|---------|------|----------------------|----|------|----|--------------------|
| B2 | GZ      | 1.5  | Overburden           |    |      |    |                    |
|    | 1.5     | 10.5 | Sandstone / Mudstone |    |      |    |                    |
|    | 10.5    | 12.2 | Coal                 |    |      |    |                    |
|    | 12.2    | 13.2 | Mudstone             |    |      |    |                    |
| A4 | GZ      | 1.5  | Overburden           |    |      |    |                    |
|    | 1.5     | 10.4 | Sandstone / Mudstone |    |      |    |                    |
|    | 10.4    | 12.2 | Coal                 |    |      |    |                    |
|    | 12.2    | 13.2 | Mudstone             |    |      |    |                    |
| A1 | Angered |      |                      |    |      |    |                    |
|    | GZ      | 1.6  | Overburden           |    |      |    |                    |
|    | 1.6     | 10.8 | Sandstone / Mudstone |    |      |    |                    |
|    | 10.8    | 12.5 | Coal                 |    |      |    |                    |
|    | 12.5    | 13.5 | Mudstone             |    |      |    |                    |
| C1 | Angered |      |                      |    |      |    |                    |
|    | GZ      | 1.6  | Overburden           |    |      |    |                    |
|    | 1.6     | 11.0 | Sandstone / Mudstone |    |      |    |                    |
|    | 11.0    | 12.7 | Coal                 |    |      |    |                    |
|    | 12.7    | 13.7 | Mudstone             |    |      |    |                    |

| Remarks                                                              | Totals   | Boreholes | Drilled | Cased |
|----------------------------------------------------------------------|----------|-----------|---------|-------|
|                                                                      | Today    | 4         | 53.6    |       |
| Signed by<br>Sirius Remediation Ltd<br>(Drilling Division):<br>Date: | Previous | 23        | 286.2   |       |
| Signed<br>by Client:<br>Date:                                        | To Date  | 27        | 339.8   |       |



Remediation

## OPENHOLE DRILL LOG

4245 Park Approach, Thorpe Park, Leeds, LS15 8GB

Tel: 0113 264 9960

Fax: 0113 264 9962

Job No. SOS 3285 Contract Name: Brymbo Rig Type: C6

Date: 19<sup>th</sup> NOVEMBER Client: Mrs Jones Crew Details: R Edwards

Sheet: 1 of: 1 Working Day No. Thursday M Green

| BH       | From | To   | Strata Description   | BH                   | From | To   | Strata Description   |
|----------|------|------|----------------------|----------------------|------|------|----------------------|
| D2       | Gz   | 1.5  | Overburden           | A2                   | Gz   | 1.8  | Overburden           |
|          | 1.5  | 10.7 | Sandstone / Mudstone |                      | 1.8  | 10.5 | Sandstone / Mudstone |
|          | 10.7 | 12.5 | Coal                 |                      | 10.5 | 12.0 | Coal                 |
|          | 12.5 | 13.5 | Mudstone             |                      | 12.0 | 13.0 | Mudstone             |
| E1 AUGER |      |      |                      |                      |      |      |                      |
|          | Gz   | 1.8  | Overburden           | TESTHOLE G/H 7,8     | Gz   | 4.5  | Overburden           |
|          | 1.8  | 11.0 | Sandstone / Mudstone |                      | 4.5  | 6.0  | Sandstone / Mudstone |
|          | 11.0 | 12.7 | Coal                 |                      | 6.0  | 9.5  | Soft Grout           |
|          | 12.7 | 13.7 | Mudstone             |                      | 9.5  | 10.5 | Mudstone             |
| F2       | Gz   | 1.5  | Overburden           | TESTHOLE A, B / 3, 4 | Gz   | 2.5  | Overburden           |
|          | 1.5  | 10.8 | Sandstone / Mudstone |                      | 2.5  | 9.8  | Sandstone / Mudstone |
|          | 10.8 | 12.5 | Coal                 |                      | 9.8  | 12.5 | Soft Grout           |
|          | 12.5 | 13.5 | Mudstone             |                      | 12.5 | 13.5 | Mudstone             |
| C3       | Gz   | 1.8  | Overburden           |                      |      |      |                      |
|          | 1.8  | 10.7 | Sandstone / Mudstone |                      |      |      |                      |
|          | 10.7 | 12.2 | Coal                 |                      |      |      |                      |
|          | 12.2 | 13.2 | Mudstone             |                      |      |      |                      |
| E3       | Gz   | 2.0  | Overburden           |                      |      |      |                      |
|          | 2.0  | 10.5 | Sandstone / Mudstone |                      |      |      |                      |
|          | 10.5 | 12.2 | Coal                 |                      |      |      |                      |
|          | 12.2 | 13.2 | Mudstone             |                      |      |      |                      |

| Remarks                                                                                              | Totals   | Boreholes | Drilled | Cased |
|------------------------------------------------------------------------------------------------------|----------|-----------|---------|-------|
|                                                                                                      | Today    | 8         | 104.1   |       |
| Signed by<br>Sirius Remediation Ltd<br>(Drilling Division): <u>[Signature]</u> Date: <u>19/11/15</u> | Previous | 27        | 339.8   |       |
| Signed<br>by Client: _____ Date: _____                                                               | To Date  | 35        | 443.9   |       |



# GROUTING LOGS



# SIRIUS REMEDIATION LTD

## DAILY GROUTING RETURN

4245 Park Approach, Thorpe Park, Leeds, LS15 8GB Tel: 0113 264 9960 Fax: 0113 264 9962

Job No. SDS3285 Contract Name: Brymbo

Date: 18/11/2015 Client: G Jones

Sheet: 1 of 1 Working Day No 1

| Hole No.       | Depth (m) | Press (psi) | PFA  | OPC  | Sand | Gravel | Total Grout | Remarks         | Crew Details<br>R Edwards<br>M Green |       |            |        |
|----------------|-----------|-------------|------|------|------|--------|-------------|-----------------|--------------------------------------|-------|------------|--------|
| E06            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| E08            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| E10            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| F07            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            | Materials Delivered Today            |       |            |        |
| F08            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| F09            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            | Item                                 | Quant | Ticket No. |        |
| G06            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            | OPC                                  | 2.00  | F89030     |        |
| G07            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            | PFA                                  | 19.92 | 14583      |        |
| G08            |           |             | 1.80 | 0.15 |      |        | 1.95        | Still Taking    |                                      |       |            |        |
| G09            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| G10            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| H06            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| H07            |           |             | 0.84 | 0.07 |      |        | 0.91        | Full            |                                      |       |            |        |
| H09            |           |             | 0.12 | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
|                |           |             |      |      |      |        |             |                 |                                      |       |            |        |
|                |           |             |      |      |      |        |             |                 |                                      |       |            |        |
|                |           |             |      |      |      |        |             |                 |                                      |       |            |        |
| Total Used     |           |             | 4.08 | 0.34 | 0.00 | 0.00   | 4.42        |                 | PFA                                  | OPC   | Sand       | Gravel |
|                |           |             |      |      |      |        | Today       |                 | 19.92                                | 2.00  | 0.00       | 0.00   |
| Previous Total |           |             | 0.00 | 0.00 | 0.00 | 0.00   | 0.00        | Previous        | 0.00                                 | 0.00  | 0.00       | 0.00   |
|                |           |             |      |      |      |        |             | Total Delivered | 19.92                                | 2.00  | 0.00       | 0.00   |
| Total to Date  |           |             | 4.08 | 0.34 | 0.00 | 0.00   | 4.42        | Total Used      | 4.08                                 | 0.34  | 0.00       | 0.00   |
|                |           |             |      |      |      |        |             | Stock on Site   | 15.84                                | 1.66  | 0.00       | 0.00   |

Signed by SDS

R Edwards

Date:

18/11/2015

Signed by Client

Date:



# SIRIUS REMEDIATION LTD

## DAILY GROUTING RETURN

4245 Park Approach, Thorpe Park, Leeds, LS15 8GB Tel: 0113 264 9960 Fax: 0113 264 9962

Job No. SDS3285 Contract Name: Brymbo

Date: 19/11/2015 Client: G Jones

Sheet: 1 of 2 Working Day No 2

| Hole No.       | Depth (m) | Press (psi) | PFA   | OPC  | Sand | Gravel | Total Grout | Remarks         | Crew Details<br>R Edwards<br>M Green |       |            |        |
|----------------|-----------|-------------|-------|------|------|--------|-------------|-----------------|--------------------------------------|-------|------------|--------|
| G08            |           |             | 1.20  | 0.10 |      |        | 1.30        | Full            | Materials Delivered Today            |       |            |        |
| H08            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| A01            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| A02            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| A03            |           |             | 3.60  | 0.30 |      |        | 3.90        | Full            | Item                                 | Quant | Ticket No. |        |
| A04            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| B02            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| B03            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| B04            |           |             | 2.40  | 0.20 |      |        | 2.60        | Full            |                                      |       |            |        |
| C01            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| C03            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| C04            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| C05            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| D02            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| D04            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
| E01            |           |             | 0.12  | 0.01 |      |        | 0.13        | Full            |                                      |       |            |        |
|                |           |             |       |      |      |        |             |                 |                                      |       |            |        |
| Total Used     |           |             | 8.76  | 0.73 | 0.00 | 0.00   | 9.49        |                 | PFA                                  | OPC   | Sand       | Gravel |
| Previous Total |           |             | 4.08  | 0.34 | 0.00 | 0.00   | 4.42        | Today           |                                      |       |            |        |
|                |           |             |       |      |      |        |             | Previous        | 19.92                                | 2.00  | 0.00       | 0.00   |
|                |           |             |       |      |      |        |             | Total Delivered | 19.92                                | 2.00  | 0.00       | 0.00   |
| Total to Date  |           |             | 12.84 | 1.07 | 0.00 | 0.00   | 13.91       | Total Used      | 12.84                                | 1.07  | 0.00       | 0.00   |
|                |           |             |       |      |      |        |             | Stock on Site   | 7.08                                 | 0.93  | 0.00       | 0.00   |

Signed by SDS

R Edwards

Date:

19/11/2015

Signed by Client

Date:



## SIRIUS REMEDIATION LTD

### DAILY GROUTING RETURN

4245 Park Approach, Thorpe Park, Leeds, LS15 8GB Tel: 0113 264 9960 Fax: 0113 264 9962

Job No. SDS3285 Contract Name: Brymbo

Date: 19/11/2015 Client: G Jones

Sheet: 2 of 2 Working Day No 2

| Hole No.       | Depth (m) | Press (psi) | PFA                                    | OPC  | Sand | Gravel | Total Grout | Remarks         | Crew Details              |       |            |        |
|----------------|-----------|-------------|----------------------------------------|------|------|--------|-------------|-----------------|---------------------------|-------|------------|--------|
| E03            |           |             | 0.12                                   | 0.01 |      |        | 0.13        | Full            | Materials Delivered Today |       |            |        |
| E05            |           |             | 0.12                                   | 0.01 |      |        | 0.13        | Full            |                           |       |            |        |
| F02            |           |             | 0.12                                   | 0.01 |      |        | 0.13        | Full            |                           |       |            |        |
| F04            |           |             | 0.12                                   | 0.01 |      |        | 0.13        | Full            |                           |       |            |        |
|                |           |             |                                        |      |      |        |             |                 | Item                      | Quant | Ticket No. |        |
| Test Boreholes |           |             |                                        |      |      |        |             |                 |                           |       |            |        |
| G/H 7/8        |           |             | 0.12                                   | 0.01 |      |        | 0.13        | Full            |                           |       |            |        |
| A/B 3/4        |           |             | 0.12                                   | 0.01 |      |        | 0.13        | Full            |                           |       |            |        |
|                |           |             | Borehole pressured and held for 5 mins |      |      |        |             |                 |                           |       |            |        |
|                |           |             |                                        |      |      |        |             |                 |                           |       |            |        |
|                |           |             |                                        |      |      |        |             |                 |                           |       |            |        |
|                |           |             |                                        |      |      |        |             |                 |                           |       |            |        |
|                |           |             |                                        |      |      |        |             |                 |                           |       |            |        |
|                |           |             |                                        |      |      |        |             |                 |                           |       |            |        |
|                |           |             |                                        |      |      |        |             |                 |                           |       |            |        |
|                |           |             |                                        |      |      |        |             |                 |                           |       |            |        |
| Total Used     |           |             | 0.72                                   | 0.06 | 0.00 | 0.00   | 0.78        |                 | PFA                       | OPC   | Sand       | Gravel |
| Previous Total |           |             | 12.84                                  | 1.07 | 0.00 | 0.00   | 13.91       | Today           | 0.00                      | 0.00  | 0.00       | 0.00   |
|                |           |             |                                        |      |      |        |             | Previous        | 19.92                     | 2.00  | 0.00       | 0.00   |
|                |           |             |                                        |      |      |        |             | Total Delivered | 19.92                     | 2.00  | 0.00       | 0.00   |
| Total to Date  |           |             | 13.56                                  | 1.13 | 0.00 | 0.00   | 14.69       | Total Used      | 13.56                     | 1.13  | 0.00       | 0.00   |
|                |           |             |                                        |      |      |        |             | Stock on Site   | 6.36                      | 0.87  | 0.00       | 0.00   |

Signed by SDS

R Edwards

Date: 19/11/2015

Signed by Client

Date:



## APPENDIX D

### CUBE RESULTS, BLEED AND FLOW TEST RESULTS

# Bleed and Flow Test Results



Site:

Job No:

| Date          | Bleed Test |     |     | Flow Test (mm) | Notes |
|---------------|------------|-----|-----|----------------|-------|
|               | 2hr        | 4hr | 6hr |                |       |
| Mon:          |            |     |     |                |       |
| 16th Nov 2015 |            |     |     |                |       |
|               |            |     |     |                |       |
|               |            |     |     |                |       |
|               |            |     |     |                |       |
| Tues:         |            |     |     |                |       |
| 17th Nov 2015 |            |     |     |                |       |
|               |            |     |     |                |       |
|               |            |     |     |                |       |
|               |            |     |     |                |       |
| Wed:          |            |     |     |                |       |
| 18th Nov 2015 | 2%         | 2%  | 3%  | 450            |       |
|               |            |     |     | 420            |       |
|               |            |     |     | 400            |       |
|               |            |     |     |                |       |
| Thurs:        |            |     |     |                |       |
| 19th Nov 2015 | 1%         | 2%  | 3%  | 400            |       |
|               |            |     |     | 380            |       |
|               |            |     |     | 420            |       |
|               |            |     |     |                |       |
| Fri:          |            |     |     |                |       |
|               |            |     |     |                |       |
|               |            |     |     |                |       |
|               |            |     |     |                |       |
|               |            |     |     |                |       |
| Sat:          |            |     |     |                |       |
|               |            |     |     |                |       |
|               |            |     |     |                |       |
|               |            |     |     |                |       |



# CONCRETE TEST CUBE REPORT

(BS EN 12390-3:2009)



29 Rufford Court  
Woolston  
Warrington  
WA1 4RF  
United Kingdom  
Tel: +44(0) 1925 286220  
Fax: +44(0) 1925 838135

Report no: WAB50682699\_01

Date: 21/12/2015

Client: SIRIUS REMEDIATION LTD

Scheme: BRYMBO - SDS3285

Contract no: 51019619

| Request Sheet No. | Lab Ref. | Client Ref. | Date Made  | Time Made | Date Received in Laboratory | Date Tested | Age days | Dimensions mm | Density kg/m <sup>3</sup> | Failure Load kN | Compressive Strength N/mm <sup>2</sup> | Specified Strength at 28 days N/mm <sup>2</sup> |
|-------------------|----------|-------------|------------|-----------|-----------------------------|-------------|----------|---------------|---------------------------|-----------------|----------------------------------------|-------------------------------------------------|
| 403945            | 50682699 | SDS 3286    | 18/11/2015 |           | 25/11/2015                  | 16/12/2015  | 28       | 100x100x100   | 1550                      | 57.0            | 5.7                                    | not given                                       |

Location: -  
Mix details: 12:1

The following apply unless otherwise stated under Remarks.

- 1) Laboratory curing range 18°-22°C.
- 2) Cube appearance as received satisfactory.
- 3) Test moisture condition and density saturated.
- 4) Cube failure normal. Concrete appearance normal.
- 5) Volume determined by measurement or designated size. Any fins removed by abrasive stone.
- 6) Laboratory curing conditions cannot be assured during tank cleaning.
- 7) Certificate of sampling not received. Certificate of making and curing not received.
- 8) Rate of Loading 0.4 to 0.8 N/mm<sup>2</sup> per sec.

Issued to: SIRIUS REMEDIATION LTD

Certified that curing in the laboratory and testing carried out in accordance with BS EN 12390-2 and 12390-7 and 12390-3.

Signed

Karl Monks - Concrete Section Manager

for and on behalf of Environmental Scientifics Group Limited



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Contract no: 51019619

| Request Sheet No. | Lab Ref. | Client Ref. | Date Made  | Time Made | Date Received in Laboratory | Date Tested | Age days | Dimensions mm | Density kg/m <sup>3</sup> | Failure Load kN | Compressive Strength N/mm <sup>2</sup> | Specified Strength at 28 days N/mm <sup>2</sup> |
|-------------------|----------|-------------|------------|-----------|-----------------------------|-------------|----------|---------------|---------------------------|-----------------|----------------------------------------|-------------------------------------------------|
| 403946            | 50682701 | SDS 3286    | 19/11/2015 |           | 25/11/2015                  | 17/12/2015  | 28       | 100x100x100   | 1560                      | 59.3            | 5.9                                    | not given                                       |

Location: -  
Mix details: 12:1

The following apply unless otherwise stated under Remarks.

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- 2) Cube appearance as received satisfactory.
- 3) Test moisture condition and density saturated.
- 4) Cube failure normal. Concrete appearance normal.
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