



**Haigh Huddleston & Associates**

**Civil & Structural Engineering Consultants**

Our Ref: E19/7366/MD/05

Date: 22 June 2021

Firth Buildings, 99 -101 Leeds Road, Dewsbury, WF12 7BU

t 01924 464342 f 01924 450662 e martin@haighhuddleston.co.uk

**FAO Stewart Brown**

Stewart@yorkshirecountryproperties.co.uk

Dear Sir,

**Remediation Method Statement for Site at Station Road, Skelmanthorpe**

**1. INTRODUCTION**

- 1.1 Haigh Huddleston & Associates have been requested by Yorkshire Country Properties to provide a remediation statement for the proposed development off Station Road, Skelmanthorpe.
- 1.2 The purpose of the document is to specify the remediation philosophy for the site and to specify the fill materials that are required for regrading the site if required.
- 1.3 Site investigation works have been undertaken and are detailed in HHA Report E19/7366/R001 dated April 2019, with subsequent gas monitoring reported in HHA Letter E19/7366/DP/001 dated June 2019. These reports have been utilised to compile this Remediation Statement.

**2. RESULTS OF THE INVESTIGATION**

- 2.1 Trial pits in the majority of the site proved 0.2-0.4m of topsoil overlying 0.5-1.3m of firm to stiff clay. Underlying this a weak weathered mudstone was encountered at depths of 0.8-3.6m below existing ground levels. The boreholes proved clay to depths of 2.3-3.1m underlain by alternating bands of mudstone. An unworked 0.7-0.8m thick seam of coal was encountered at 6.4-11.4m below existing ground levels.
- 2.2 In TP02 in the south east of the site, 0.3m of dark loamy topsoil overlaid re-engineered clays containing weathered mudstone and coal fragments to the base of the trial pit at 3.1m below existing ground levels. The borehole in this area of the site proved the re-engineered clays extended to 8.1m below existing ground levels with mudstone beneath.
- 2.3 No elevated levels of contaminants were recorded in the samples submitted for chemical analysis.
- 2.4 No asbestos was found in the samples taken from site.
- 2.5 On site, no methane concentrations were detected. Carbon dioxide values were found between 0.0 and a maximum of 3.8%. The only gas flow recorded on site was as a result of elevated ground water levels causing increased pressure within the monitoring station. Based on a high sensitivity end use under the

NHBC traffic light system in conjunction with CIRIA C665, the GSV value corresponds to the site being characterised as **Green**.

- 2.6 Due to the steep nature of the existing site, re-grading works will be required along with retaining walls. Extra material may need to be imported to site to achieve the proposed site levels. However, it is anticipated that in this instance there will be more cut than fill.

## **2.6 REMEDIATION OBJECTIVES**

- 2.6.1 From the above, the remediation works required can be stated as follows:

- Extent of former opencast workings to be confirmed to determine affect on proposed foundation proposals and external works.
- Determine if shallow mineworkings associated with former opencast mining would adversely affect site and if stabilisation works are required.
- Site levels to be regraded.
- Further sampling of existing topsoil to be undertaken to confirm suitability for re-use on site.

## **3. REMEDIATION PROPOSALS**

### **3.1 FURTHER INVESTIGATION WORKS**

- 3.1.1 Due to the presence of infilled historical opencast mine workings in the south eastern area of the site, it is proposed to undertake further investigation works. Only one borehole and trial pit undertaken to date proved made ground/re-engineered clays and it is not anticipated a large area of the site will prove to have been opencast.
- 3.1.2 A site scrape is to be undertaken in the south eastern area of the site to better determine the extents of the former opencast and the presence of any surface workings indicating the presence of bellpits.
- 3.1.3 Further rotary borehole investigation works are to be undertaken within and adjacent the opencast works to confirm the depth of works and confirm whether shallow underground workings extend from the base of the former opencast mine.
- 3.1.4 A further S.I. Report will detail the findings of these additional investigation works and confirm the affect on the proposed development.

### **3.1 SITE REGRADING**

- 3.2.1 As part of the development, ground levels are to be raised and lowered to achieve acceptable gradients for the proposed adoptable highway, private drives and garden area. If there is insufficient site-won material to achieve this, clean 6F2 will need to be imported to site to raise the ground levels.

- 3.2.3 The infill material should be laid and consolidated in 150-200mm thick layers in accordance with the D.O.T. specification and dependant on the plant proposed for use on site.
- 3.2.4 Site levels should be re-graded to 300mm below proposed final ground where clean imported fill is used to raise levels to accommodate a minimum 300mm thickness of clean topsoils and subsoils. Beneath areas of hardstanding the final levels should be adjusted to accommodate driveway construction.

### **3.3 FURTHER SAMPLING**

- 3.3.1 Prior to works commencing on site, all topsoil should be scraped and stockpiled behind protective fencing to prevent cross-contamination during on-site works. Further sampling should be undertaken to achieve a minimum of 1 sample per 250m<sup>3</sup> of topsoil.
- 3.3.2 Based on an average topsoil depth of 300mm and site area of 8000m<sup>2</sup>, there is approximately  $8000 \times 0.3 = 2400\text{m}^3$  of topsoil. This equates to ten samples of topsoil needed in total based on 1 sample per 250m<sup>3</sup>. As six samples of topsoil have already proven clean, a further four samples are required.
- 3.3.3 In the unlikely event there is insufficient topsoil, or the further testing proves the material unsuitable for re-use on site, clean material will be required to be imported to site.
- 3.3.4 All imported material to be used for the capping/topsoil layer should be uncontaminated and comply with the specification for Engineering Fill. All imported material should be tested for the full range of contaminants listed to the rear of this report. Only material found to be below published trigger levels should be deemed uncontaminated and accepted for use on site.
- 3.3.5 If the imported material is from a Greenfield site, a minimum of 3 samples or 1 per 250m<sup>3</sup> of imported material should be taken for testing, whichever is greater. If it is from a brownfield site, a minimum of 6 samples, or 1 per 100m<sup>3</sup> of imported material should be taken for testing, whichever is greater. Material provided by a commercial supplier should be certified to the same level of testing, with the certificate less than two months old.
- 3.3.6 All imported certified material should be placed immediately. If this is not possible, or the material is not certified and sampling is to be carried out prior to being laid, it should be securely stored on site prior to use to prevent possible contamination from any materials on site.

## **4. REMEDIATION VALIDATION**

- 4.1 Any imported clean material should have been certified with testing having taken place within two months of the material being imported to site. In the absence of this, soil samples should be taken from the capping layer and chemically analysed to demonstrate that there are no elevated levels of contamination present.

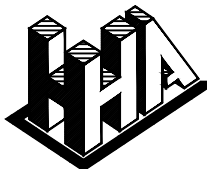
- 4.2 If suspected contaminated material is found during remediation works, the independent consultant must be contacted and the extent of it must be established by further testing. All contaminated material must be removed from the site and replaced by equivalent uncontaminated material.
- 4.3 All site records and results of the shallow trial pits should be consolidated into a validation report. The report shall be completed in accordance with 'Yorkshire and Lincolnshire Pollution Advisory Group: Verification Requirements For Cover Systems'.
- 4.4 All topsoil must be in place and notification given to the validation engineers at least 2 weeks prior to the expected completion date. This will allow time for onsite investigation and chemical analysis to be undertaken and report compiled in line with the CML initiative.
- 4.5 Clean material imported should be visually inspected to confirm it doesn't contain unsuitable materials (i.e. glass, brick, etc)

We trust that the above is sufficient for your current requirements, however should you need any further information please do not hesitate to contact me direct.

Yours faithfully,



MICHAEL DEAN BSc (Hons) HND  
m.dean@haighhuddleston.co.uk



**Haigh Huddleston & Associates**

Civil Structural Engineering Consultants

Firth Buildings, 99 - 101 Leeds Rd, Dewsbury, WF12 7BU t 01924 464342 f 01924 450662  
e trevor.haigh@haighhuddleston.co.uk

|                                  |     |         |              |
|----------------------------------|-----|---------|--------------|
| Project                          |     |         |              |
| YORKSHIRE COUNTRY PROPERTIES     |     |         |              |
| Client                           |     |         |              |
| STATION ROAD, SKELMANTHORPE      |     |         |              |
| Detail                           |     |         |              |
| MINE WORKINGS INVESTIGATION PLAN |     |         |              |
| Scale                            | Dwn | Date    | Dwg No.      |
| 1:500@A3                         | CM  | June'21 | E18/7366/035 |

-  TRIAL PIT
-  BOREHOLE
-  BOREHOLE WITH GAS MONITORING STATION
-  AREA OF SITE STRIP

**TIER 1 SOIL GUIDANCE VALUES FOR USE IN DOMESTIC GARDENS**  
**(WITH PLANT UPTAKE)**

| <b><u>CONTAMINANT</u></b> | <b><u>ICRCL – TTV /<br/>DEFRA – SGV</u></b><br><b><u>MG/KG</u></b> |
|---------------------------|--------------------------------------------------------------------|
| <b>Arsenic</b>            | 37 (4)                                                             |
| <b>Cadmium</b>            | 22 (4)                                                             |
| <b>Chromium</b>           | 130 (2)                                                            |
| <b>Lead</b>               | 200 (4)                                                            |
| <b>Mercury</b>            | 1.2 (1)                                                            |
| <b>Selenium</b>           | 250 (1)                                                            |
| <b>Copper</b>             | 2400 (1)                                                           |
| <b>Nickel</b>             | 180 (1)                                                            |
| <b>Zinc</b>               | 3700 (1)                                                           |
| <b>Cyanide (total)</b>    | 25                                                                 |
| <b>Sulphate</b>           | 0.24% (3)                                                          |
| <b>Sulphide</b>           | 250                                                                |
| <b>Thiocyanate</b>        | 50                                                                 |
| <b>PAH (Total)</b>        | 40                                                                 |
| <b>TPH (Total)</b>        | 250                                                                |
| <b>Phenols</b>            | 280 (1)                                                            |
| <b>PH</b>                 | 6-8                                                                |
| <b>Asbestos</b>           | No fibres present                                                  |

- (1) Copyright Land Quality Management Ltd reproduced with permission; Publication Number S4UL3499. All rights reserved.
- (2) DEFRA CLR SGV's withdrawn used for initial comparison
- (3) BS 8110 1985 Table 6.1
- (4) Category 4 Screening Level

TIER 1 SOIL GUIDANCE VALUES FOR USE IN DOMESTIC GARDENS WITH  
PLANT UPTAKE  
(SPECIATED PAH)

| <u>CONTAMINANT</u>           | <u>SCREENING</u><br><u>CRITERIA</u><br><u>FOR PAH</u><br><u>(mg/kg)</u> |
|------------------------------|-------------------------------------------------------------------------|
| <b>Acenaphthlene</b>         | 210 (1)                                                                 |
| <b>Acenaphthylene</b>        | 170 (1)                                                                 |
| <b>Anthracene</b>            | 2400 (1)                                                                |
| <b>Benz[a]anthracene</b>     | 7.2 (1)                                                                 |
| <b>Benzo(a)pyrene</b>        | 5 (2)                                                                   |
| <b>Benzo[b]fluoranthene</b>  | 2.6 (1)                                                                 |
| <b>Benzo[ghi]perylene</b>    | 320 (1)                                                                 |
| <b>Benzo[k]fluoranthene</b>  | 77 (1)                                                                  |
| <b>Chrysene</b>              | 15 (1)                                                                  |
| <b>Dibenzo[ah]anthracene</b> | 0.24 (1)                                                                |
| <b>Fluoranthene</b>          | 280 (1)                                                                 |
| <b>Fluorene</b>              | 170 (1)                                                                 |
| <b>Indeno[123-cd]pyrene</b>  | 27 (1)                                                                  |
| <b>Naphthalene</b>           | 2.3 (1)                                                                 |
| <b>Phenanthrene</b>          | 95 (1)                                                                  |
| <b>Pyrene</b>                | 620 (1)                                                                 |

- (1) Copyright Land Quality Management Ltd reproduced with permission; Publication Number S4UL3499. All rights reserved.
- (2) Category 4 Screening Level

**LQM S4UL SCREENING VALUES FOR SPECIATED TOTAL TPH**  
**(RESIDENTIAL WITH PLANT UPTAKE 1% SOM)**

| <b>Petroleum Hydrocarbons</b> | <b>LQM S4UL Screening Values (mg/kg)</b> |
|-------------------------------|------------------------------------------|
| <b>Aliphatics</b>             |                                          |
| C5-C6                         | 42                                       |
| C6-C8                         | 100                                      |
| C8-C10                        | 27                                       |
| C10-C12                       | 130 (38)                                 |
| C12-C16                       | 1100 (24)                                |
| C16-C35                       | 65000 (8.48)                             |
| <b>Aromatics</b>              |                                          |
| C5-C7                         | 70                                       |
| C7-C8                         | 130                                      |
| C8-C10                        | 34                                       |
| C10-C12                       | 74                                       |
| C12-C16                       | 140                                      |
| C16-C21                       | 260                                      |
| C21-C35                       | 1100                                     |