SLADEN ASSOCIATES

REPORT ON PHASE 2 GROUND INVESTIGATION
Proposed Residential Development
Former Pride of the Moorlands PH
Junction Road
Leek
Staffordshire

Prepared for

Moss Builders Ltd

Date : December 2017 **Job No : 17 1844**

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Prepared for: **Moss Builders Ltd**

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1 INTRODUCTION

Moss Builders Ltd has instructed Sladen Associates to carry out a ground investigation for a proposed new residential development at the site of the former 'Pride of the Moorlands' Public House in Leek.

The investigation included a review of the site history, environmental and geological setting and development of a conceptual model of potential pollution linkages as well as intrusive fieldwork using a mini-drilling rig, subsequent laboratory testing of samples and a monitoring programme.

The current report presents the factual results of the intrusive investigation together with recommendations for the geotechnical and geo-environmental aspects of site development.

2 THE SITE

2.1 LOCATION AND SURFACE CONDITIONS

The site, which has an overall area of about 0.16 Ha, is located immediately to the south west of Junction Road, some 0.5 km south of Leek Town Centre at National Grid Reference 3980 3557, see Figures 1 and 2. To the south west is an access road to the Leek Auctions premises, which occupy a large area to the south of the site. There is residential development to the north and south east of the site. To the west there is mainly industrial development. Ground levels in the area drop relatively steeply to the south and west and rise to the north east. There is a large cemetery area to the north east of Junction Road from the site.

At the time of the recent field programme, the buildings of the former public house were still present on site and the remaining site areas were mainly used for parking. The ground surface is generally poor quality asphalt with some concrete. Because of the topography, the rear ground level of the main building is one storey lower than at the front. The pub is disused, with some vehicles parked in the former car park areas.

2.2 PROPOSED DEVELOPMENT

It is proposed to re-develop the site with the construction of seven new houses comprising one block of three and a staggered block of four. The houses would all have private rear gardens, with parking and some soft landscaping to the front. The currently proposed site layout is shown in Figure 3.

2.3 HISTORY

Copies of relevant historical Ordnance Survey (OS) maps are included in Appendix A, for reference. Aerial photography dating from the period 2003 to 2017 was also reviewed.

At the time of the first Ordnance Survey in 1879, the site was without development and lay near the northern end of a larger agricultural field. The route of Junction Road was already an established thoroughfare to the north east. At that time there was a railway line to the west of the site, with the edge of the railway slope forming the western site boundary. There was a residence, 'Barnfield' fronting onto Junction Road to the north of the site. Otherwise the surrounding land uses were mainly agricultural.

Little change is then shown until some time between 1899 and 1926, when the site was terraced, presumably by fill placement to bring the northern site area up to a level compatible with Junction Road and a series of houses were built on site and in the area to east and south. These were in several rows, one fronting the road and another, partly on site, set back somewhat. An escarpment is shown passing west north west to east south east through the southern site area to the rear of the second row of houses and, at the toe of the slope, a third row of four houses had been constructed, off site. A further terrace of houses had been built fronting the road to the east of the site.

By 1937 most of the rows of houses had been removed, leaving only two fronting onto Junction Road, one of which straddled the north eastern tip of the site. Otherwise the site was largely vacant. By that time the residence 'Barnfield' to the north of the site, had been removed and replaced with three pairs of semi-detached houses; two pairs fronting onto the road and the third set back to the rear of those.

At some time between 1955 and 1968, the remaining pair of houses, one of which straddled the site boundary, had been removed and the public house, at that time known as 'The Herdsman' constructed on site. The access road to the east had also been constructed, leading to the newly developed cattle market in a large area to the south of the site. Little change is then shown on the available map or air photo record.

2.4 GEOLOGY

The site is shown on maps published by the British Geological Survey to be underlain by solid strata of the Chester Formation, formerly known as the Chester Pebble Beds, part of the Sherwood Sandstone Group, of Triassic Age. These rocks comprise mainly weak sandstones and conglomerates. The Chester Formation can be weathered to the consistency of a sand soil where present near surface. The bedrock in the site area is not shown to be overlain by natural drift deposits.

This interpretation of the local natural geology is consistent with the findings of the recent field programme. Weathered Chester Formation strata were encountered below a layer of made ground. No natural superficial strata were encountered.

2.5 HYDROGEOLOGY

The Sherwood Sandstone strata are widely used for water supply purposes and are classified as a Principal Aquifer by the Environment Agency. There are, however, no licensed groundwater abstractions within 1 km of the site, the closest being some 1.3 km to the north for general farming and domestic purposes, see Appendix B. There are also a number of other non-potable licensed groundwater abstractions within the search radius 1 to 2 km and three licensed potable abstractions. The potable abstractions are all operated by Severn Trent Water Limited and are sited at 1.46 to 1.97 km from the site, see Appendix B for details. The site lies within the Zone 3 (Total Catchment) Source Protection Zone associated with these or other potable water supplies.

There are no nearby surface water features, the closest being a stream, some 260 m to the south. The natural general direction of near surface groundwater flow in the area would be expected to be to the south, but may be affected by groundwater abstraction.

The site is not shown, on mapping produced by the Environment Agency, to be potentially prone to flooding from rivers.

2.6 NEARBY LANDFILL SITES

Searches have revealed no evidence of current landfills within 250 m of the site but there is record of one former landfill area within that search radius, refer Appendix B. The former landfill area was a small site that accepted only inert, industrial and commercial waste. It was some 155 m to the south of the site and operated during the period 1960 to 1980.

2.7 POLLUTION INCIDENTS

Database searches show no records of pollution incidents to controlled waters within 250 m of the site, refer Appendix B.

2.8 RADON

The site is not in an area where radon protection measures are required for new residential development, Appendix B.

2.9 MINING

The site is not in an area where underground mining has been undertaken at shallow depth in the past.

3 FIELD AND LABORATORY PROGRAMME

3.1 FIELDWORK

The fieldwork comprised six boreholes put down using window sample techniques with a mini-rig (BH1 to BH6). In situ dynamic probe testing (DPSH Method) was undertaken adjacent to the borehole locations prior to drilling and in situ 'SPT' testing was undertaken near the base of the boreholes during drilling. The exploration hole locations are shown on the site layout plan, Figure 2.

Samples were recovered from the boreholes for the purposes of classification and laboratory testing. Soil samples were screened for potential VOC (Volatile Organic Compound) impaction using a hand held PID (Photo Ionisation Detector) meter. Groundwater/gas level monitoring standpipes were installed in three of the boreholes during backfilling. The fieldwork was undertaken on 30th October 2017.

Detailed logs of the exploration holes are included in Appendix C. Reference should be made to the logs for details of ground conditions at these locations but a generalised summary is provided in Section 4 Ground Conditions, below.

3.2 SAMPLE HANDLING

All soil samples recovered from the field for potential chemical laboratory testing were divided into four sub samples; one sealed 250 ml glass jar, two sealed 60 ml glass jars and one 1l plastic tub. The glass jars were placed in cool boxes and were subsequently stored in a refrigerator. Following a review of data and scheduling, the selected jar and tub samples were transported to the laboratory (glass jars in cool boxes). The glass jars are used by the laboratory for all analysis for potentially volatile or organic determinands.

3.3 LABORATORY TESTING

Selected near surface soil samples were tested for a variety of potential contaminants as well as sulphate and pH. The detailed results of this work are included in Appendix B and chemical test results are summarised in Tables 1 to 4.

4 GROUND CONDITIONS

4.1 GENERAL

Ground conditions at the borehole locations were found to comprise a layer of made ground, overlying natural soils considered to be weathered Chester Formation bedrock.

4.2 MADE GROUND

Made ground was present at all of the exploration hole locations and, where proved, extended to depths in the range 0.35 m (BH4) to 1.1 m (BH1). At BH6 refusal was met on an obstruction at 1.0 m depth, still in made ground. The made ground was variable in nature and, although predominantly granular.

The granular units were typically medium dense or loose to medium dense, locally dense, sandy gravel or sand with varying amounts of gravel. At BH1 the top 0.3 m of the made ground was classified as soft sandy clay with occasional gravel. The gravel fraction of the made ground included, variously, quartz, ash, brick, sandstone and locally glass.

4.3 CHESTER FORMATION BEDROCK

Sand soils, considered to be weathered Chester Formation, were found to underlie the made ground at all locations where the full thickness of made ground was penetrated. The weathered bedrock was generally described as a loose or medium dense sand, becoming very dense with depth. Effective refusal was met at relatively shallow depth, with the weathered bedrock being proved to a maximum depth of 2.15 m (BH1).

4.4 GROUNDWATER

Free groundwater was not encountered during drilling of the boreholes. The standpipes were dry during the monitoring period.

4.5 CONTAMINATION

Apart from ash present in the made ground and asphalt surface materials, No visible or olfactory evidence of potentially significant ground contamination was noted during the recent fieldwork and PID screening showed no evidence of volatile organic compounds.

5 GEO-ENVIRONMENTAL ASSESSMENT

5.1 GEOTECHNICAL CONSIDERATIONS

5.1.1 FOUNDATION CONDITIONS

It is not recommended that foundations to support structural loads be founded within the made ground. Natural weathered bedrock strata are, however, present at relatively shallow depth and conventional spread or trench fill foundations should be suitable to support structural loads. Foundations taken down to natural soils at a depth of not less than 0.8 m may be designed for an allowable net bearing pressure of 100 kPa. Any made or disturbed ground, topsoil, soft or otherwise deleterious material that is encountered below founding level should be removed and replaced with compacted

granular fill or mass concrete. At some locations, foundations would need to be deeper than 0.8 m reach suitable bearing strata. Blinding concrete should be placed as soon as practicable after subgrade preparation.

The site soils are predominantly granular in nature and no special precautions are considered warranted with respect to potential shrinkage and swelling.

5.1.2 FLOOR SLABS

In view of the variable thickness and nature of made ground present, consideration should be given to the use of structurally supported floors such as the 'beam and block' system.

5.1.3 BURIED CONCRETE

Tests to determine the water-soluble sulphate content of soils (Table 3) gave values in the range of less than 0.004 to 0.12 g/l. These can be compared to the level of 0.5 g/l suggested by BRE Special Digest 1 (2005 Revision) as the level above which special precautions to protect buried concrete from sulphate attack in natural ground may be appropriate. The measured pH values were in the range 5.4 to 11.1, indicating that acidic conditions are locally present on site. However, foundations would be expected to be above the water table. Accordingly, it is considered that the site may be classified as exhibiting Class DS-1/AC-1s conditions as per BRE Special Digest 1. Further guidance with regard to the design of buried concrete can be found in BRE Special Digest 1.

5.2 ENVIRONMENTAL CONSIDERATIONS

5.2.1 SOIL CONTAMINATION ASSESSMENT

5.2.1.1 CONCEPTUAL MODEL

5.2.1.1.1 General

The site history has not shown any potentially highly contaminative land usages.

The site was undeveloped agricultural land and then in residential use before becoming the site of a public house and associated parking areas. Those usages would not be expected to be associated with a high potential for significant ground contamination to be present although the parking areas could be associated with some potential for local spillage of oils and fuels.

There is some made ground on site and some ash was noted in the made ground. Asphalt is present at the surface in some areas. No other visible or olfactory evidence of potential ground contamination was observed during the field programme. PID meter screening showed no evidence of VOC impaction, as would be associated with any significant impaction with light fuels. Ash and asphalt can be associated with some potential for elevated concentrations of some metals, and sometimes PAH compounds, and asphalt with elevated heavy TPH fractions, but by their nature, potential leachable concentrations are generally very low.

There are no nearby off-site land uses that have been identified that would potentially be associated with any significant risk of contamination of the site soils.

5.2.1.1.2 Source/Hazard Assessment

Based on the above discussion, the probability of significant sources of ground contamination being present on site is considered to be moderate.

Five samples of near surface soil, were tested for a wide range of potential contaminants and presence of asbestos.

It is appropriate to consider three broad groups of contaminants. Firstly those that are potentially toxic to humans, secondly 'phytotoxins', which are potentially toxic to plants but not normally to humans and thirdly, potentially aggressive substances that may attack building materials. The latter have been discussed in 5.1.3 'Buried Concrete', above. Plants are discussed in Section 5.2.1.6 'Plants', below. Human health considerations are discussed in Section 5.2.1.3 'Generic Quantitative Human Health Risk Assessment'.

With respect to potential hydrocarbon contamination, the following sequence of observation and testing was undertaken:

- Odour, if detected, would be noted.
- Soil samples from the boreholes were screened for potential VOC impaction using a hand held PID meter, none was detected.
- The basic laboratory testing suite included speciated PAHs.
- TPH fractions were determined in accordance with the narrow banded ranges proposed by the TPH Criteria Working Group (Gustafson et al, 1997 'TPCWG') and the proportions of aliphatic and aromatic compounds were determined.
- Analysis was undertaken to determine the concentrations of BTEX compounds, which represent the most volatile aromatic TPH compounds.

5.2.1.1.3 Receptors

Potential receptors with respect to any ground contamination that may be present include site users and the wider environment. With regard to the latter, the bedrock strata below the site are considered to be a Principal Aquifer and the site lies within a groundwater source protection zone. As such the groundwater below the site would be considered a sensitive receptor, although given the site's elevated position, depth to groundwater is likely to be relatively high. There are no nearby potable water abstractions or surface water courses.

5.2.1.1.4 Pathways and Credible Potential Pollution Linkages

Site users could potentially be exposed to ground contamination through direct contact with soil, dust and vapour inhalation and dust ingestion. As new garden areas are envisaged, ingestion of soil attached to vegetables and vegetables that may have taken up some contamination from the site soils are also potentially viable pathways.

The only practical 'wider' environmental pathway whereby potential contaminants, if present within the near surface soils on site, could migrate from the site following development would be by leaching to the groundwater and thence dissolved phase migration and eventual discharge to and abstraction or the surface water system. The groundwater itself within the bedrock strata would be considered a potential receptor but in the absence of any significant source of leachable contamination, there would be no credible pollution linkage with respect to controlled waters.

5.2.1.2 PRELIMINARY RISK ASSESSMENT

In view of the potential presence of some local contaminants associated with ash and asphalt in the made ground, risks to site users are considered, at the preliminary risk assessment stage, to be moderate if no special precautions are taken. In view of the apparent absence of potentially significant sources of leachable contamination, risks to controlled waters are considered to be low.

5.2.1.3 GENERIC QUANTITATIVE HUMAN HEALTH RISK ASSESSMENT

Measured levels of potential contaminants have been compared with preliminary generic screening values. These were taken to be current 'CLEA' Soil Guideline Values, where these exist (see Tables 1A to C).

CLEA SGV's have not been published for some determinands and the guidance that formed the basis for some of the published SGV's has been withdrawn. Where no current guidance has been published, "suitable for use" levels (S4UL's), published by LQM 2015 (Publication S4UL3287) were adopted as GAC (Generic Assessment Criteria) levels. Published SGV's relate to soil organic matter (SOM) contents of 6 % and S4UL values have been published for SOM values of 1, 2.5 and 6 %. A value of SOM of 6 % was adopted for preliminary screening, less than the measured site average value (16%). For lead, there is no current SGV or S4UL value and the screening value adopted is based on the 'Category 4', acceptable risk screening levels published by Defra. For these comparisons, the 95% upper confidence level (UCL) of the mean concentration of potential contaminants is usually adopted and the UCL and the maximum measured values are included in the tables.

Given the proposed nature of the development GAC values for residential usage with plant uptake have been adopted for the tables. Based on this testing, UCL values for two heavy TPH fractions and seven PAH compounds exceed the relevant GAC value.

No potentially asbestos containing materials were noted during the field programme and no asbestos fibres were detected in any of the soil samples.

Some additional assessment or precautions are therefore warranted with respect to elevated concentrations of heavy TPH fractions and some PAH compounds.

5.2.1.4 FURTHER CONSIDERATION WITH RESPECT TO HEAVY TPH FRACTIONS AND PAH COMPOUNDS

The heavy TPH fractions and PAH compounds present at elevated concentrations in the made ground are not volatile and the main exposure pathways are associated with soil and dust contact, ingestion and inhalation and via home grown vegetables. These pathways can be broken by provision of clean cover soils in garden and soft landscape areas. The source of the elevated PAH and TPH in the near surface soil at the site is considered most likely associated with ash and asphalt.

Remedial options are discussed later in the report.

5.2.1.5 CONSTRUCTION WORKERS

Construction workers could potentially be exposed to contact with site soils and dust inhalation but it is not considered that more than standard precautions would be required to protect site workers.

5.2.1.6 PLANTS

The CLEA approach only considers risks to human health of site users but CLR11 states that ICRCL Guidance Note 70/90 may be used for initial screening criteria for plants. Where values are not provided in ICRCL 70/90, the relevant values from former ICRCL Guidance Note 59/83 have been adopted. The test results are summarised in Table 2.

Based on these criteria, no elevated concentrations of phytotoxins were measured. It is therefore not considered that any additional special precautions are considered warranted with respect to plants.

5.2.1.7 GENERIC CONTROLLED WATERS RISK ASSESSMENT

The only practical 'wider' environmental pathway whereby potential contaminants within the near surface soils on site could migrate from the site following development would be by leaching to the groundwater and thence migration and eventual discharge to the surface water system or abstraction. In order to assess the potential for leaching of contaminants, an initial screening was carried out where total measured levels of contamination were compared to a leachate trigger level. This was taken to be 1) a generic Level 1 target value derived using the Environment Agency's RTM methodology (see Appendix C for details of derivation), or 2) the lower threshold concentration as defined in former EA guidance on the disposal of contaminated soils or 3) for TPH, 500 mg/kg (the current value used to define 'inert' waste) and for PAH 100 mg/kg, see Table 4. According to this screening three samples showed somewhat elevated total PAH and four somewhat elevated total TPH.

A review of the TPH fractions and PAH compounds present (Tables 1B and 1C) at elevated concentrations, shows that these are all very heavy molecules with high partition coefficients which would result in very low mobility in the soil and groundwater environment. As such, provided the existing asphalt surface materials are removed from site, it is not considered that any other special precautions are necessary with respect to protection of controlled waters.

5.2.1.8 OPTIONS APPRAISAL

Based on the above discussion, some additional risk assessment, remedial work or precautions are considered necessary to address elevated levels of some heavy TPH fractions and PAH compounds within the near surface made ground at the site with respect to human health considerations.

Potential remedial options are considered to be as follows:

- Removal of impacted material from sensitive areas, i.e. garden and soft landscaping areas. Excavated material could be removed from site to a suitably licensed waste disposal facility or used in less critical areas of the site, such as below buildings or roadways, or
- Provision of clean cover soils on garden and soft landscaping in the affected area.

As there is a relatively large volume of made ground on site, wholesale removal is not considered to be a practicable or sustainable option. Accordingly the clean cover option is the recommended approach.

5.2.1.9 PROPOSED REMEDIAL STRATEGY

Existing asphalt surface materials should be removed from site. It is recommended that 600 mm of clean cover (topsoil and subsoil) be provided in rear garden areas where vegetables may be grown. 450 mm thickness is recommended in other soft landscaped areas. No special precautions are considered warranted for other site areas such as below hard cover such as buildings and roads.

5.2.2 GROUND GAS

No significant thickness of potentially putrescible material has been found on site and the desk study searches have identified no potential sources of significant volumes of ground gas within 250 m of the site. Although there was formerly a small landfill some 155 m from the site, it only accepted inert, industrial and commercial waste and closed in 1980.

In order to provide a more quantitative basis for ground gas risk assessment, gas monitoring standpipes were installed in three of the boreholes and a programme of ground gas monitoring was implemented (Table 5).

No methane was detected. Carbon dioxide concentrations were generally somewhat above atmospheric levels, but with a maximum measured concentration of only 2.4 %. No measurable gas flows were recorded. Using the terminology of CIRIA 659, this would correspond to 'Characteristic Situation 1' and no special precautions are therefore considered warranted with respect to ground gas.

5.2.3 SUMMARY OF REMEDIAL PRECAUTIONS WITH REGARD TO CONTAMINATION

5.2.3.1 SOIL CONTAMINATION WITH RESPCT TO SITE USERS

Existing asphalt surface materials should be removed from site. 600 mm of clean cover (topsoil and subsoil) should be provided in rear garden areas where vegetables may be grown. 450 mm thickness is recommended in other soft landscaped areas.

5.2.3.2 GROUND GAS

No special precautions are considered warranted with respect to ground gas.

5.2.3.3 PLANTS

No special additional precautions are considered necessary with respect to plants.

5.2.3.4 WIDER ENVIRONMENT

Existing asphalt surface materials should be removed from site. No other special precautions are considered necessary with respect to protection of controlled waters.

5.2.3.5 CONSTRUCTION WORKERS

It is not expected that any but standard precautions would be required to protect construction workers.

5.2.3.6 BURIED CONCRETE

It is considered that the site may be classified as exhibiting Class DS1/AC1s conditions as per BRE Special Digest 1.

5.2.3.7 LOCAL SITE AREAS

The potential exists on a site of this nature for local areas of contamination to be present that are not identified during the ground investigation. Should any local areas of visibly potentially contaminated material be observed the affected material should be segregated and either removed from site or tested for potential re-use as fill, subject if necessary to appropriate remedial treatment.

5.3 GENERAL

There is the potential for ground conditions to be present on site between exploration holes that are different from those encountered during a ground investigation. Should significantly different ground conditions be encountered the relevance of recommendations included in the present report should be reviewed in the light of any new information.

It is recommended that design details for the proposed development be discussed with the Local Authority Environmental Health Department and the authority that will be responsible for building control, and if appropriate warranty, prior to finalisation of design

details. The appropriate utility providers should be consulted with regard to any special precautions that may be required to protect buried services.

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TABLES

TABLE 1A COMPARISON OF LEVELS OF MEASURED CONTAMINANTS WITH GENERIC SOIL GUIDELINE VALUES – PRELIMINARY HAZARD SCREENING – METALS, PHENOL AND CYANIDE

Determinand	Total No of Samples Tested	UCL	SGV/GAC	Maximum Value	Number of Outliers	Number of Samples Exceeding SGV/GAC
Cyanide	5	5.4	250	5.08	1	0
Arsenic	5	11	37	13	0	0
Boron	5	All BLD	290	<1	0	0
Cadmium	5	0.75	11	0.91	0	0
Hexavalent Chromium	5	All BLD	6	<0.6	0	0
Copper	5	89	2400	120	0	0
Lead	5	62	200	66	0	0
Mercury	5	0.54	170	0.62	0	0
Nickel	5	20	130	24	0	0
Selenium	5	All BLD	350	<1	0	0
Vanadium	5	28	410	35	0	0
Zinc	5	300	3700	270	0	0
Chromium (III)	5	4	910	4.7	0	0
Phenols	5	2.5	380	2.35	1	0

Key:

BLD	Below Limit of Detection
UCL	95% Upper Confidence Limit of Mean - See Table A

Notes:

1 Where value BLD - assumed equal to detection limit for calculation of mean values etc.
2 Where SGV not published by DEFRA,LQM S4UL (Pub No:S4UL3287) Value Used.
3 For Lead DEFRA C4SL Adopted.
4 All values are in mg/kg
5 Outliers included for UCL calculation
6 GAC Based on Sandy Loam and SOM = 6 %, Residential with Plant Uptake
7 SGV Based on Sandy Loam and SOM = 6 %, Residential with Plant Uptake

TABLE 1B COMPARISON OF LEVELS OF MEASURED CONTAMINANTS WITH GENERIC SOIL GUIDELINE VALUES – PRELIMINARY HAZARD SCREENING – TPH & BTEX

Determinand	Total No of Samples Tested	UCL	SGV/GAC	Maximum Value	Number of Outliers	Number of Samples Exceeding SGV/GAC
Aliphatic EPH >C10 - C12	5	0.31	760 sol (280)	0.43	0	0
Aliphatic EPH >C12 - C16	5	70	4300 sol (140)	65.9	1	0
Aliphatic EPH >C16 - C21	5	190	110000 sol (50)	176	1	0
Aliphatic EPH >C21 - C35	5	380	110000 sol (50)	354	1	0
Aliphatic EPH >C35 - C44	5	42	110000 sol (50)	54	0	0
Aliphatic VPH >C5 - C6	5	0.012	160	0.0117	1	0
Aliphatic VPH >C6 - C8	5	0.04	530	0.049	0	0
Aliphatic VPH >C8 - C10	5	0.18	150	0.17	0	0
Aromatic EPH >C10 - C12	5	0.2	380	0.28	0	0
Aromatic EPH >C12 - C16	5	430	660	402	1	0
Aromatic EPH >C16 - C21	5	2900	930 sol (320)	2670	1	1
Aromatic EPH >C21 - C35	5	6400	1700 sol (29)	5980	1	1
Aromatic EPH >C35 - C44	5	1000	1700 sol (0.44)	942	1	0
Aromatic VPH >C8 - C10	5	0.17	190	0.15	0	0
Benzene	5	0.018	0.37	0.0176	1	0
Ethylbenzene	5	0.0048	260	0.00468	1	0
m&p-Xylene	5	0.026	310	0.0246	1	0
o-Xylene	5	0.012	330	0.0117	1	0
Toluene	5	0.015	660	0.02	0	0

Key:

BLD	Below Limit of Detection
UCL	95% Upper Confidence Limit of Mean - See Table A

Notes:

1 Where value BLD - assumed equal to detection limit for calculation of mean values etc.
2 Where SGV not published by DEFRA,LQM S4UL (Pub No:S4UL3287) Value Used.
3 For Lead DEFRA C4SL Adopted.
4 All values are in mg/kg
5 Outliers included for UCL calculation
6 GAC Based on Sandy Loam and SOM = 6 %, Residential with Plant Uptake
7 sol = exceeds the solubility or vapour saturation limit, shown in brackets

TABLE 1C COMPARISON OF LEVELS OF MEASURED CONTAMINANTS WITH GENERIC SOIL GUIDELINE VALUES – PRELIMINARY HAZARD SCREENING – PAH COMPOUNDS

Determinand	Total No of Samples Tested	UCL	SGV/GAC	Maximum Value	Number of Outliers	Number of Samples Exceeding SGV/GAC
Acenaphthene	5	14	1100 sol (340)	13.4	1	0
Acenaphthylene	5	21	920 sol (510)	19	0	0
Anthracene	5	100	11000 sol (7)	97.5	1	0
Benzo(a)anthracene	5	250	13	230	0	3
Benzo(a)pyrene	5	230	3	220	0	4
Benzo(b)fluoranthene	5	250	3.7	230	0	4
Benzo(g,h,i)perylene	5	110	350	99	0	0
Benzo(k)fluoranthene	5	110	100	100	0	1
Chrysene	5	190	27	180	0	1
Dibenz(a,h)anthracene	5	38	0.3	36	0	5
Fluoranthene	5	460	890 sol (110)	430	0	0
Fluorene	5	41	850 sol (180)	37.9	1	0
Indeno(1,2,3-c,d)pyrene	5	100	41	97	0	1
Naphthalene	5	11	13	11	0	0
Phenanthrene	5	260	440 sol (210)	240	1	0
Pyrene	5	360	2000 sol (13)	330	0	0

Key:

BLD	Below Limit of Detection
UCL	95% Upper Confidence Limit of Mean - See Table A

Notes:

1 Where value BLD - assumed equal to detection limit for calculation of mean values etc.
2 Where SGV not published by DEFRA,LQM S4UL (Pub No:S4UL3287) Value Used.
3 For Lead DEFRA C4SL Adopted.
4 All values are in mg/kg
5 Outliers included for UCL calculation
6 GAC Based on Sandy Loam and SOM = 6 %, Residential with Plant Uptake
7 sol = exceeds the solubility saturation limit, shown in brackets

TABLE 2 COMPARISON OF LEVELS OF MEASURED CONTAMINANTS WITH FORMER ICRCL THRESHOLD TRIGGER VALUES – ALL AREAS WHERE PLANTS ARE TO BE GROWN

Determinand	Total Number of Samples Tested	Mean Result (note 1)	Range	Reference Standard (See Key Below)	Trigger Value	Number of Samples Exceeding Trigger Value
Boron	5	All BLD	-	ICRCL 59/83	3	0
Copper	5	45	5.09 to 121	ICRCL 70/90	250	0
Nickel	5	13	5.84 to 23.8	ICRCL 59/83	70	0
Zinc	5	100	36.1 to 268	ICRCL 70/90	1000	0

Key:
ICRCL 59/83 ICRCL Threshold Concentration for all uses where plants are to be grown
ICRCL 70/90 ICRCL Threshold Concentration for restoration for agriculture
Notes:
1 Where value below detection limit - assumed equal to detection limit for calculation of mean values etc.
2 No action limits specified for phytotoxins
3 All values are in mg/kg

TABLE 3 SOIL SULPHATE AND PH DATA

Determinand	Total Number of Samples Tested	Mean Result	Range
pH	8	8.2	5.42 to 11.1
Sulphate (Total) %	5	0.056	0.0343 to 0.0897
Sulphate (WS) g/l	8	0.028	<0.004 to 0.12

Notes:
1 Where value below detection limit - assumed equal to detection limit for calculation of mean values etc.

TABLE 4 COMPARISON OF LEVELS OF MEASURED CONTAMINANTS WITH RTM LEVEL 1 LEACHATE SCREENING TRIGGER VALUES

Determinand	Total Number of Samples Tested	Mean Result (note 1)	Range	Reference Standard (See Key Below)	Trigger Value	Number of Samples Exceeding Trigger Value
Cyanide	5	1.8	<1 to 5.08	EA	250	0
Sulphide	5	24	<15 to 55.3	EA	250	0
Sulphur	5	720	109 to 2630	EA	5000	0
Arsenic	5	6.8	3.53 to 13.4	P20 Level 1	90	0
Boron	5	All BLD	-	P20 Level 1	20	0
Cadmium	5	0.54	0.326 to 0.91	P20 Level 1	13	0
Chromium (Total)	5	2.3	<0.9 to 4.72	P20 Level 1	96	0
Copper	5	45	5.09 to 121	P20 Level 1	420	0
Lead	5	40	18.2 to 66.2	P20 Level 1	720	0
Mercury	5	0.41	0.264 to 0.619	P20 Level 1	7.5	0
Nickel	5	13	5.84 to 23.8	P20 Level 1	80	0
Selenium	5	All BLD	-	P20 Level 1	3	0
Zinc	5	100	36.1 to 268	P20 Level 1	1000	0
Phenols	5	0.5	<0.035 to 2.35	EA	5	0
Total BTEX	5	0.035	0.024 to 0.078	IWAL	6	0
TPH (Total)	5	2700	465 to 10600	IWAL	500	4
PAH (Total)	5	600	36.9 to 2370	IWAL	100	3

Key:

P20 Level 1	Generic RTM Level 1 calculated target value
EA	Interim Guidance on the Disposal of 'Contaminated Soils' - Lower Threshold Concentration
IWAL	Waste acceptance limit for 'inert waste'
BLD	Below Limit of Detection
TPH	Total Petroleum Hydrocarbons
PAH	Poly Aromatic Hydrocarbons

Notes:

1 Where value below detection limit - assumed equal to detection limit for calculation of mean values etc.

2 All values are in mg/kg

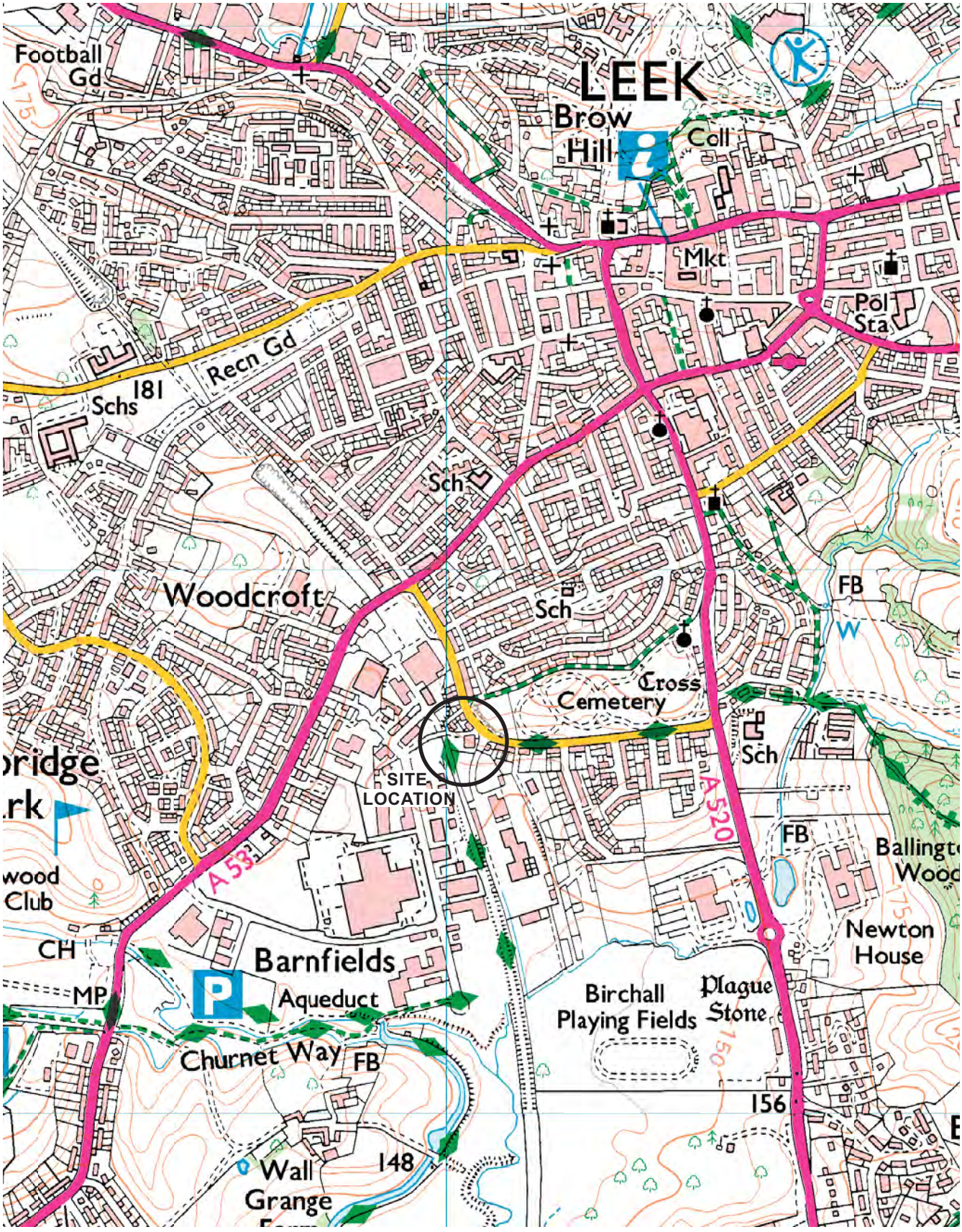
TABLE 5 GROUNDWATER AND GROUND GAS MONITORING

Date	BH	Atmospheric Pressure (bar)	CH_4 (%)	CO_2 (%)	O_2 (%)	Gas Flow Rate	Depth to Groundwater
05/11/17	1	1001	0	1.4	19.2	None	Dry (1.97)
	3		0	0.7	20.0	None	Dry (0.97)
	5		0	2.3	18.1	None	Dry (1.05)
11/11/17	1	996	0	2.1	18.4	None	Dry
	3		0	1.3	18.4	None	Dry
	5		0	2.4	18.2	None	Dry
18/11/17	1	1005	0	1.1	19.9	None	Dry
	3		0	1.5	19.4	None	Dry
	5		0	2.2	18.8	None	Dry
25/11/17	1	998	0	1.5	19.3	None	Dry
	3		0	0.8	20.3	None	Dry
	5		0	1.5	19.1	None	Dry
02/12/17	1	1011	0	1.9	19.9	None	Dry
	3		0	1.0	19.5	None	Dry
	5		0	1.2	19.6	None	Dry
08/12/17	1	1001	0	1.2	19.8	None	Dry
	3		0	0.8	19.0	None	Dry
	5		0	1.4	19.6	None	Dry

TABLE A – STATISTICAL SUMMARY OF DATA

Determinand	Shapiro-Wilk W	Normally Distributed	95% Upper Confidence Level of Mean Measured Concentration (mg/kg)	
			US95	One-Sided Chebychev
Cyanide	0.54	NO	3.6	5.4
Sulphide	0.62	NO	41	58
Sulphur	0.64	NO	1700	2800
Sulphate (WS) g/l	0.64	NO	0.053	0.087
Arsenic	0.84	YES	11	15
Boron	All Below Limit of Detection			
Cadmium	0.88	YES	0.75	0.98
Hexavalent Chromium	All Below Limit of Detection			
Copper	0.87	YES	89	140
Lead	0.87	YES	62	85
Mercury	0.92	YES	0.54	0.67
Nickel	0.94	YES	20	27
Selenium	All Below Limit of Detection			
Zinc	0.77	NO	200	300
Chromium (III)	0.87	YES	4	5.7
Phenols	0.55	NO	1.5	2.5
Aliphatic EPH >C10 - C12	0.83	YES	0.31	0.48
Aliphatic EPH >C12 - C16	0.57	NO	43	70
Aliphatic EPH >C16 - C21	0.59	NO	110	190
Aliphatic VPH >C5 - C6	0.54	NO	0.011	0.012
Aliphatic VPH >C6 - C8	0.78	YES	0.04	0.058
Aliphatic VPH >C8 - C10	0.76	NO	0.12	0.18
Aromatic EPH >C10 - C12	0.82	YES	0.2	0.32
Aromatic EPH >C12 - C16	0.56	NO	260	430
Aromatic EPH >C16 - C21	0.6	NO	1700	2900
Aromatic VPH >C5 - C7	0.54	NO	0.015	0.018
Aromatic VPH >C7 - C8	0.54	NO	0.016	0.021
Aromatic VPH >C8 - C10	0.72	NO	0.11	0.17
Benzene	0.54	NO	0.015	0.018
Ethylbenzene	0.54	NO	0.0041	0.0048
m&p-Xylene	0.54	NO	0.018	0.026
MTBE	All Below Limit of Detection			
o-Xylene	0.54	NO	0.0084	0.012
Toluene	0.8	YES	0.015	0.022
TPH (Total)	0.6	NO	6900	11000
Acenaphthene	0.59	NO	8.7	14
Acenaphthylene	0.57	NO	12	21
Anthracene	0.59	NO	62	100
Benzo(a)anthracene	0.64	NO	150	250
Benzo(a)pyrene	0.67	NO	140	230
Benzo(b)fluoranthene	0.68	NO	150	250
Benzo(k)fluoranthene	0.67	NO	67	110
Chrysene	0.63	NO	120	190
Dibenz(a,h)anthracene	0.66	NO	23	38
Fluoranthene	0.63	NO	280	460
Fluorene	0.56	NO	24	41
Naphthalene	0.6	NO	6.8	11
PAH (Total)	0.65	NO	1500	2500
Phenanthrene	0.61	NO	160	260
Pyrene	0.65	NO	220	360

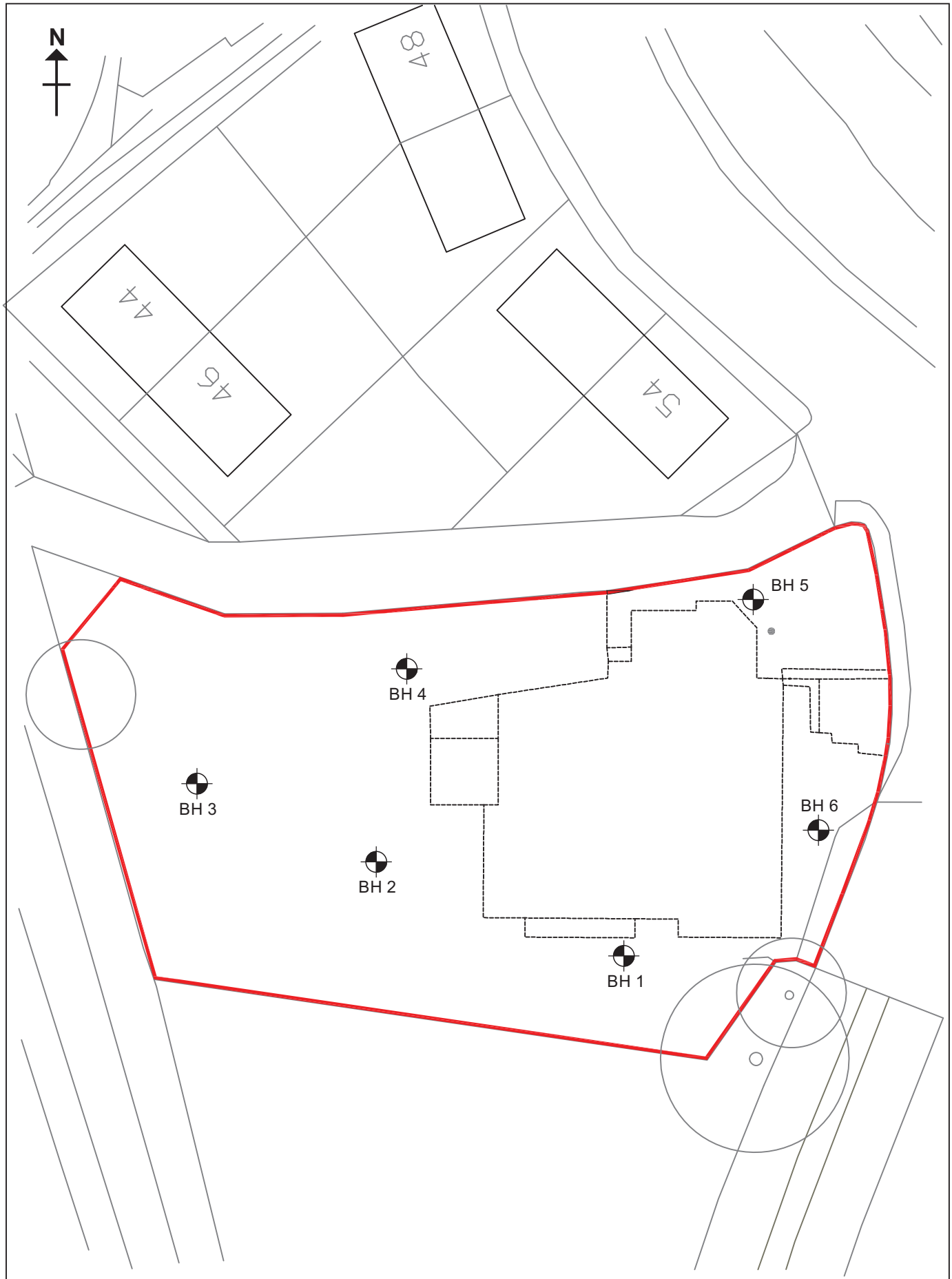
FIGURES



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SITE LOCATION PLAN

SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **1**



SITE LAYOUT PLAN

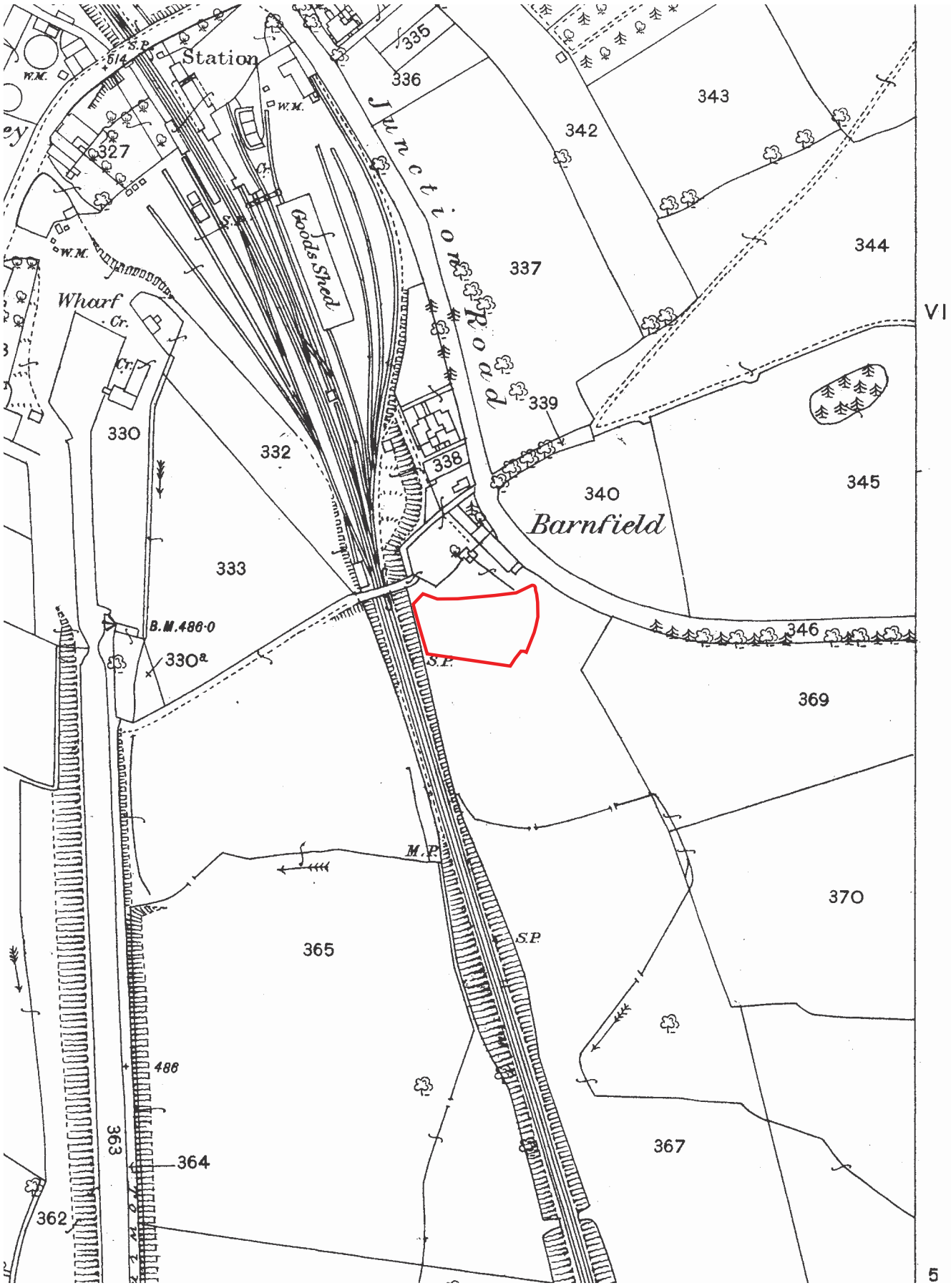
SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **2**



PROPOSED SITE LAYOUT PLAN

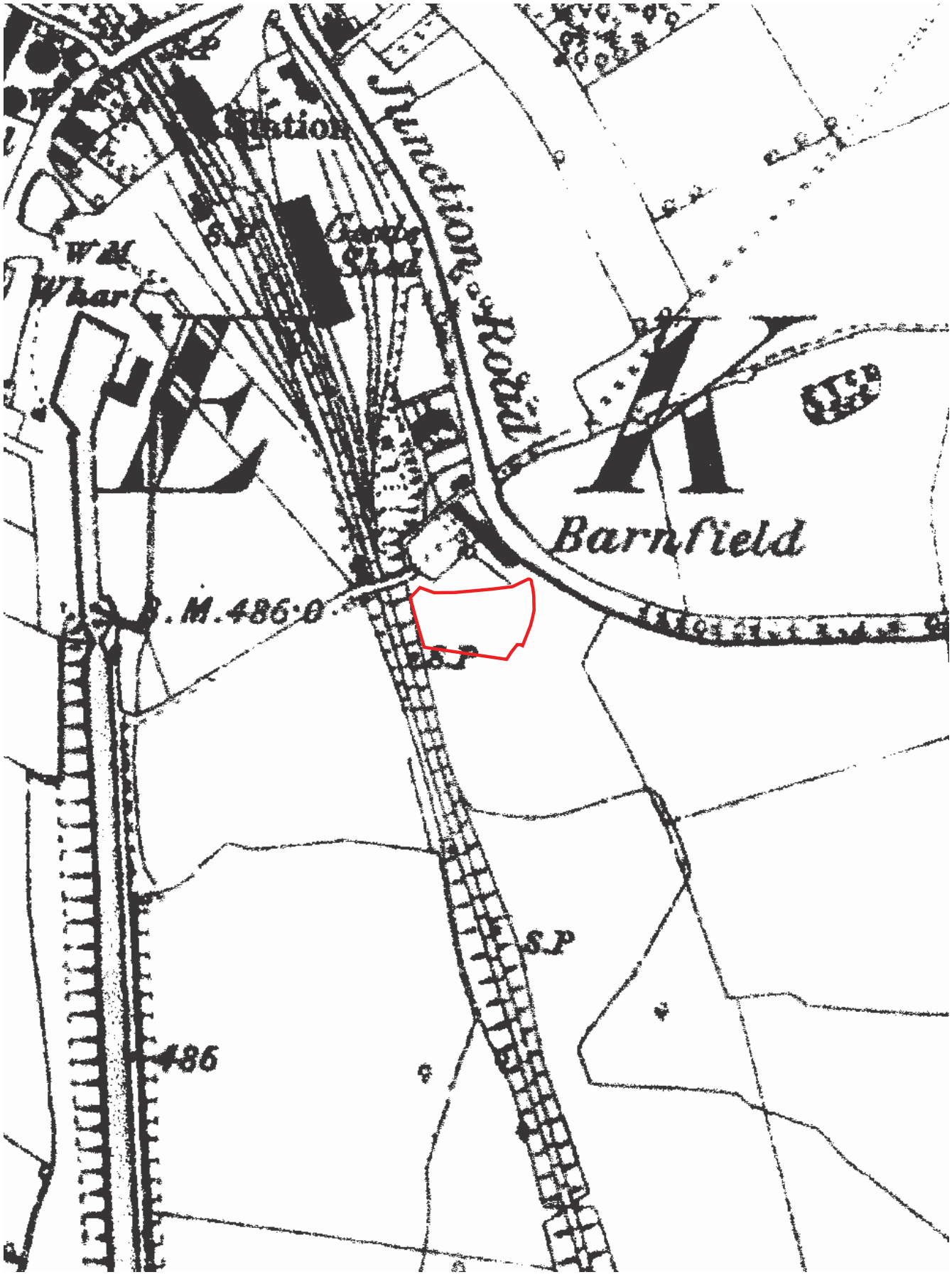
SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **3**

APPENDIX A
HISTORICAL MAPS



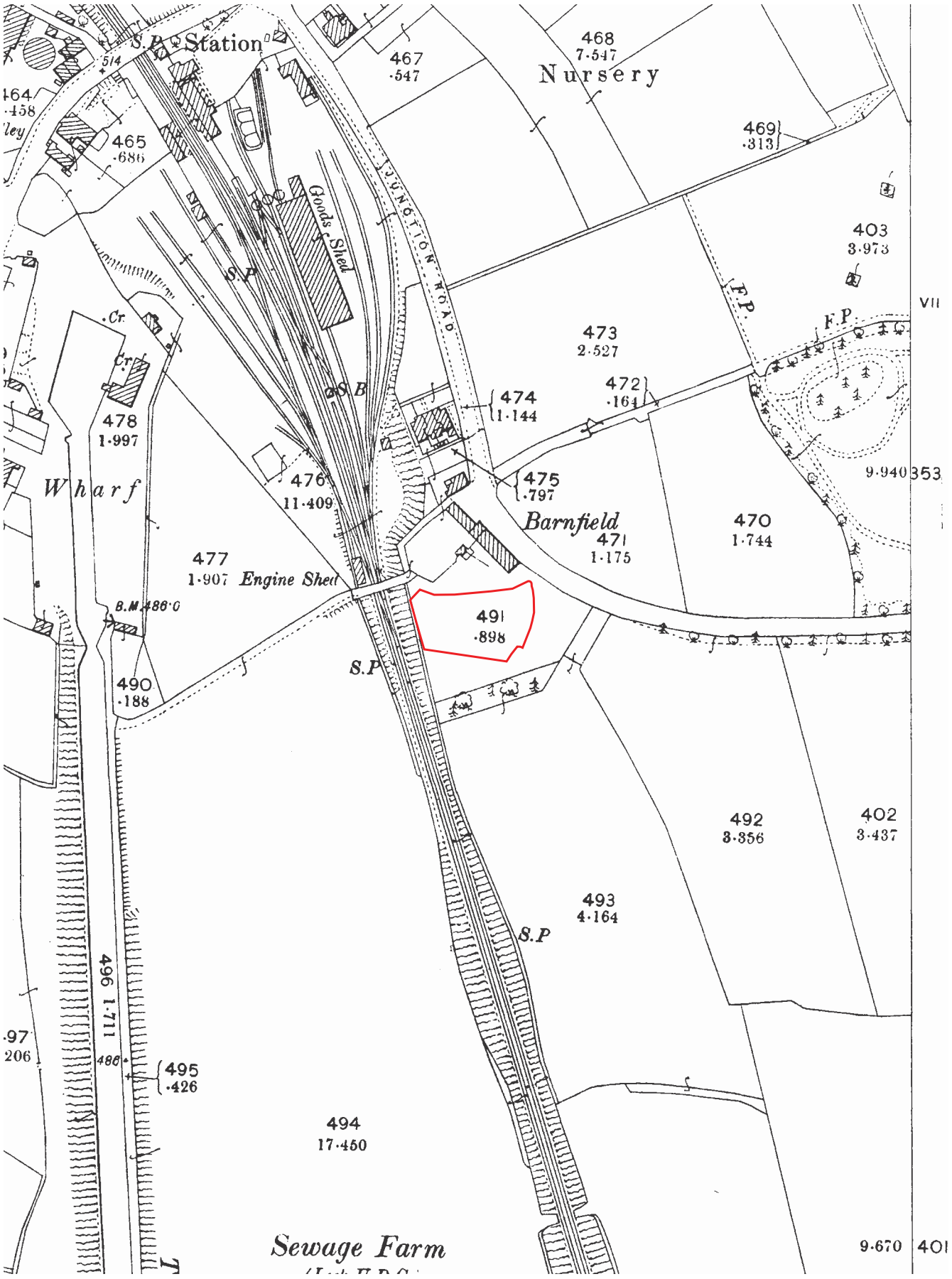
THE SITE AREA IN 1879

SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **A1**



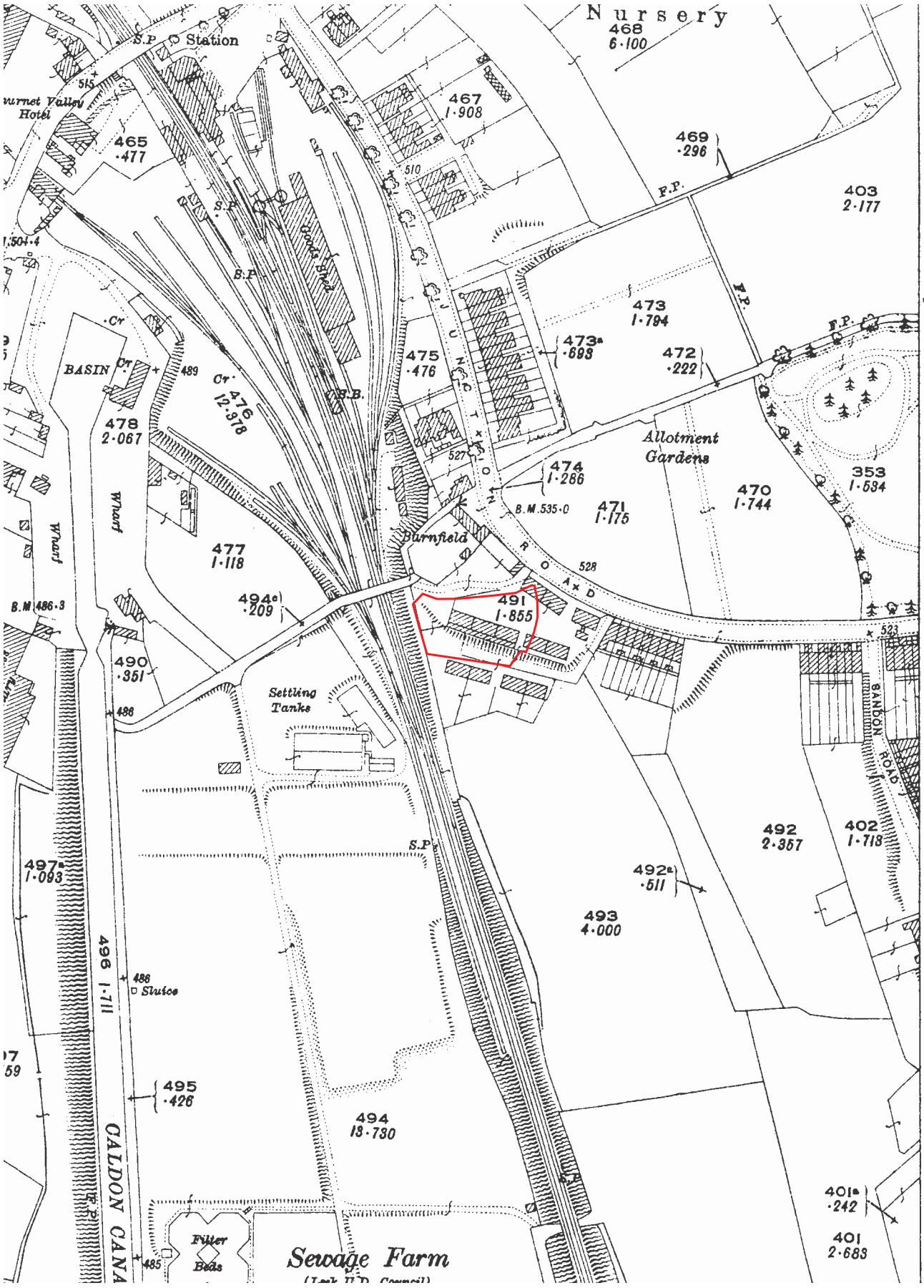
THE SITE AREA IN 1887

SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **A2**



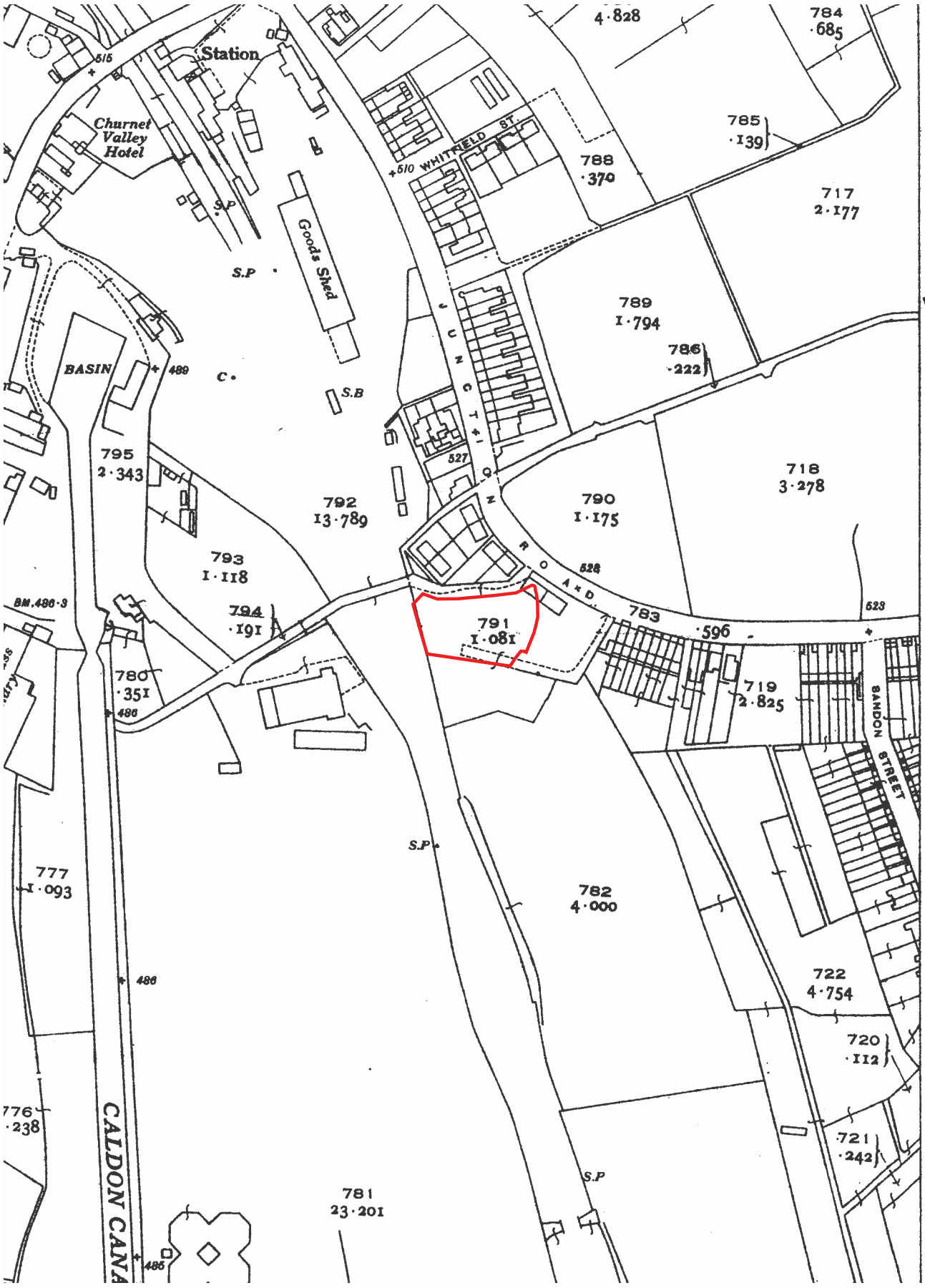
THE SITE AREA IN 1899

SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **A3**



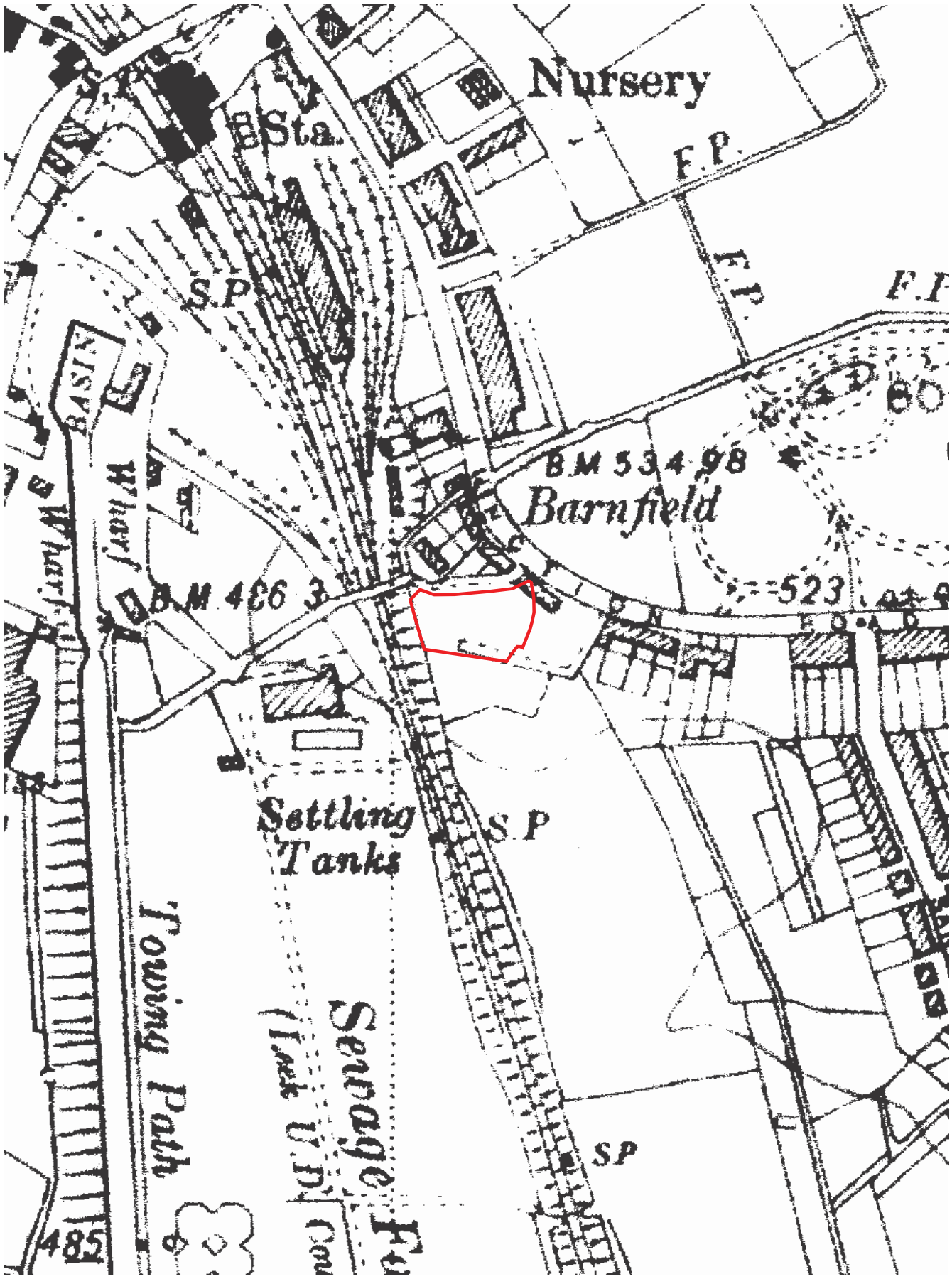
THE SITE AREA IN 1926

SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **A4**



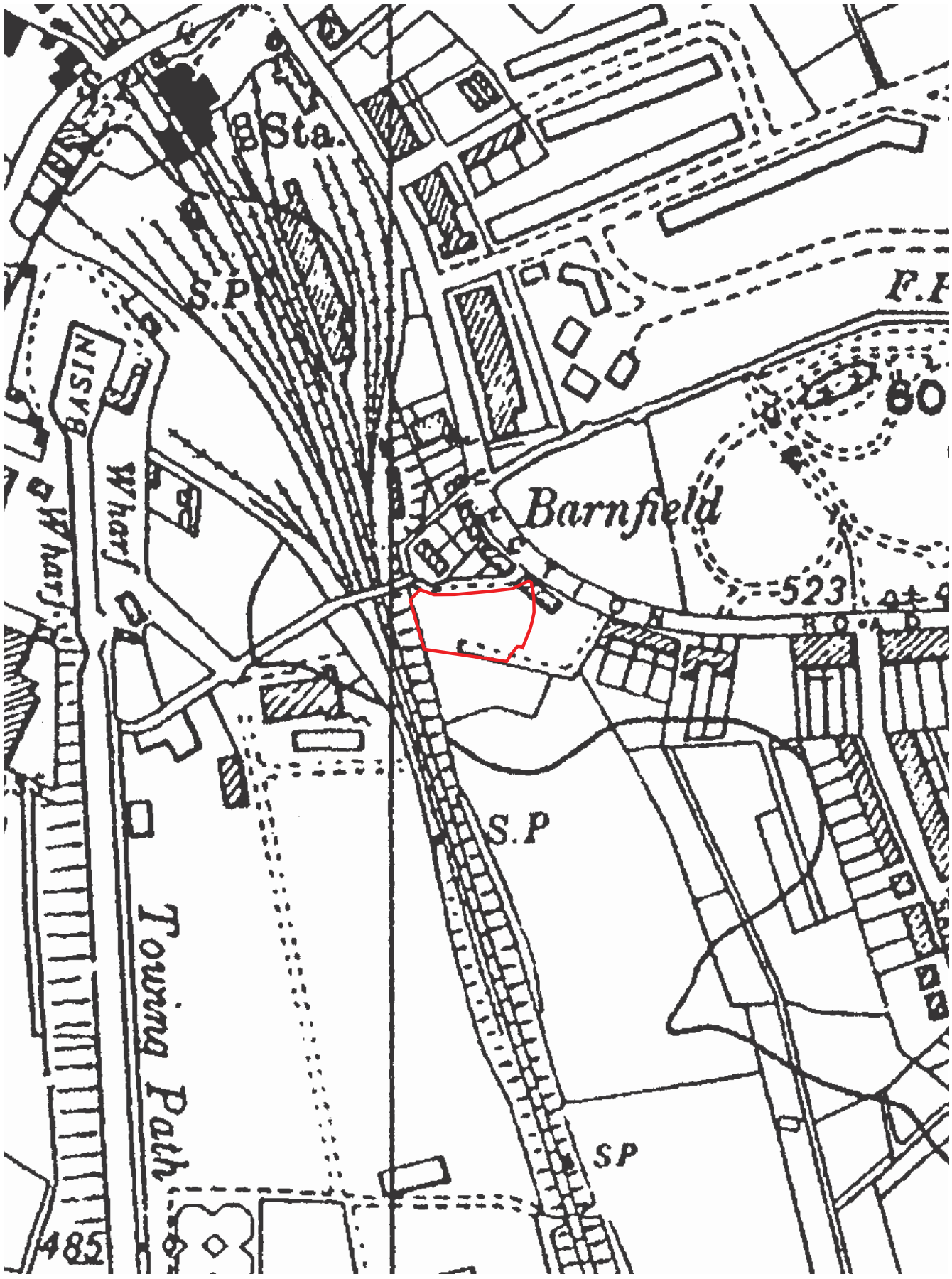
THE SITE AREA IN 1937

SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **A5**



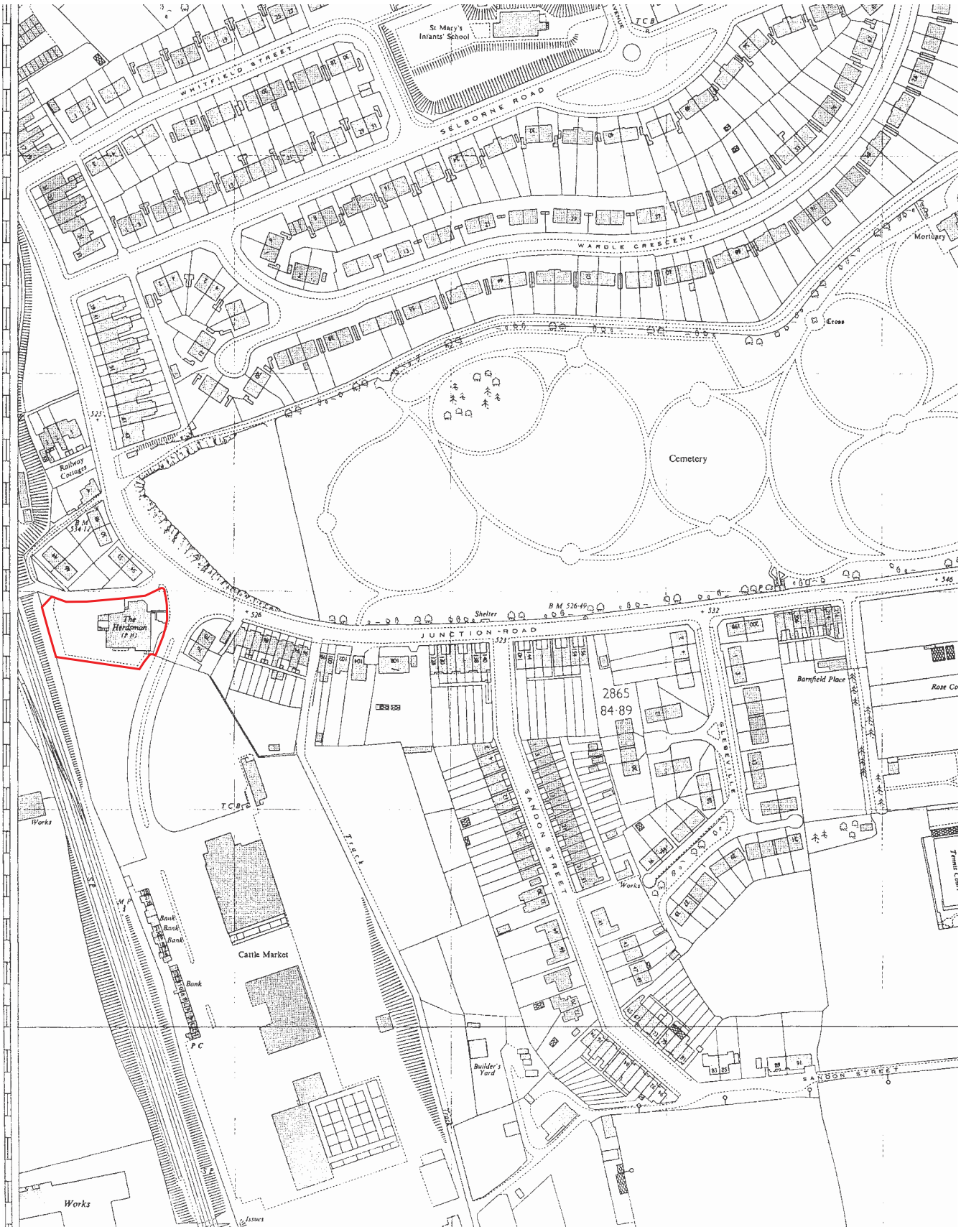
THE SITE AREA IN 1945

SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **A6**



THE SITE AREA IN 1955

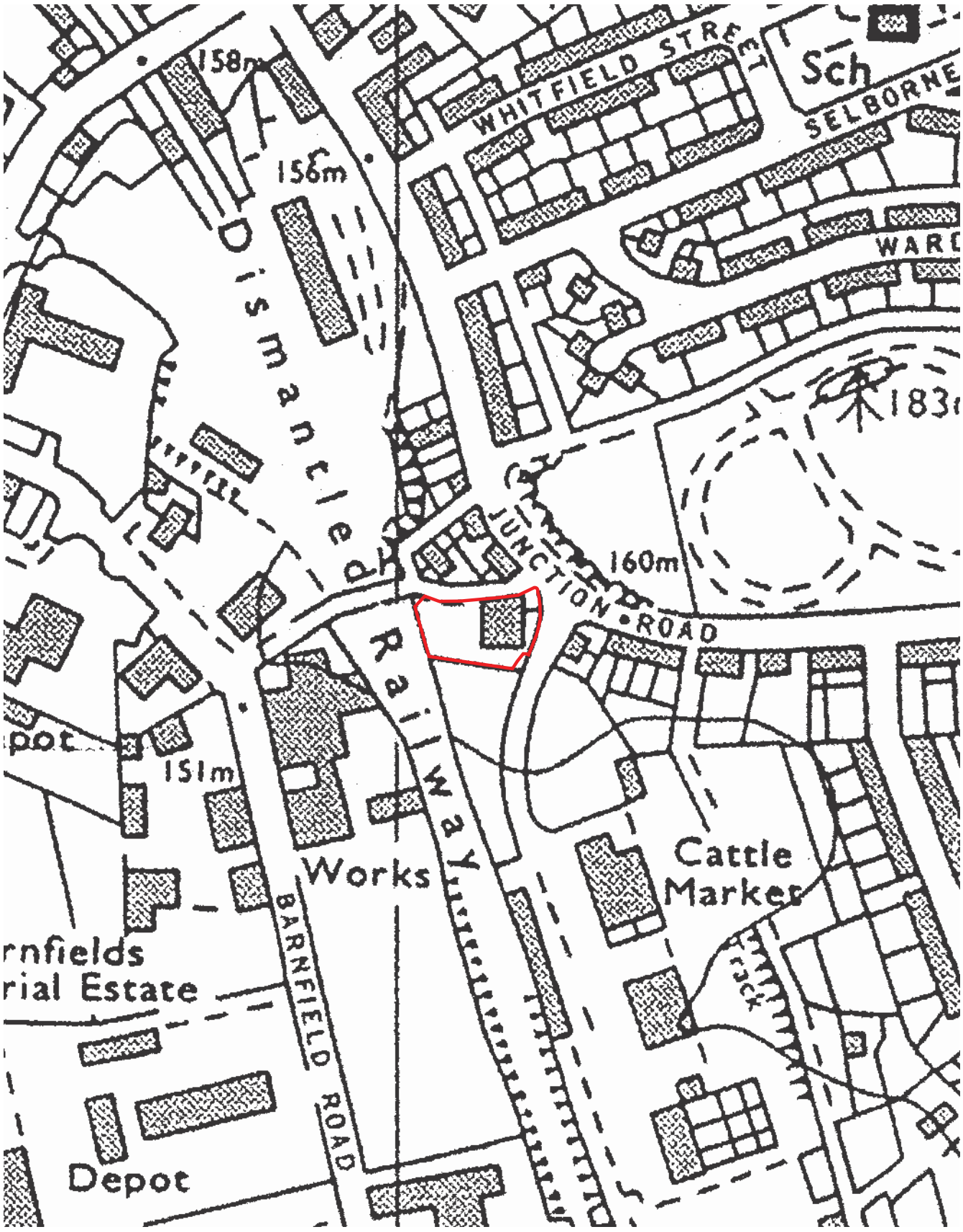
SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **A7**



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THE SITE AREA IN 1968

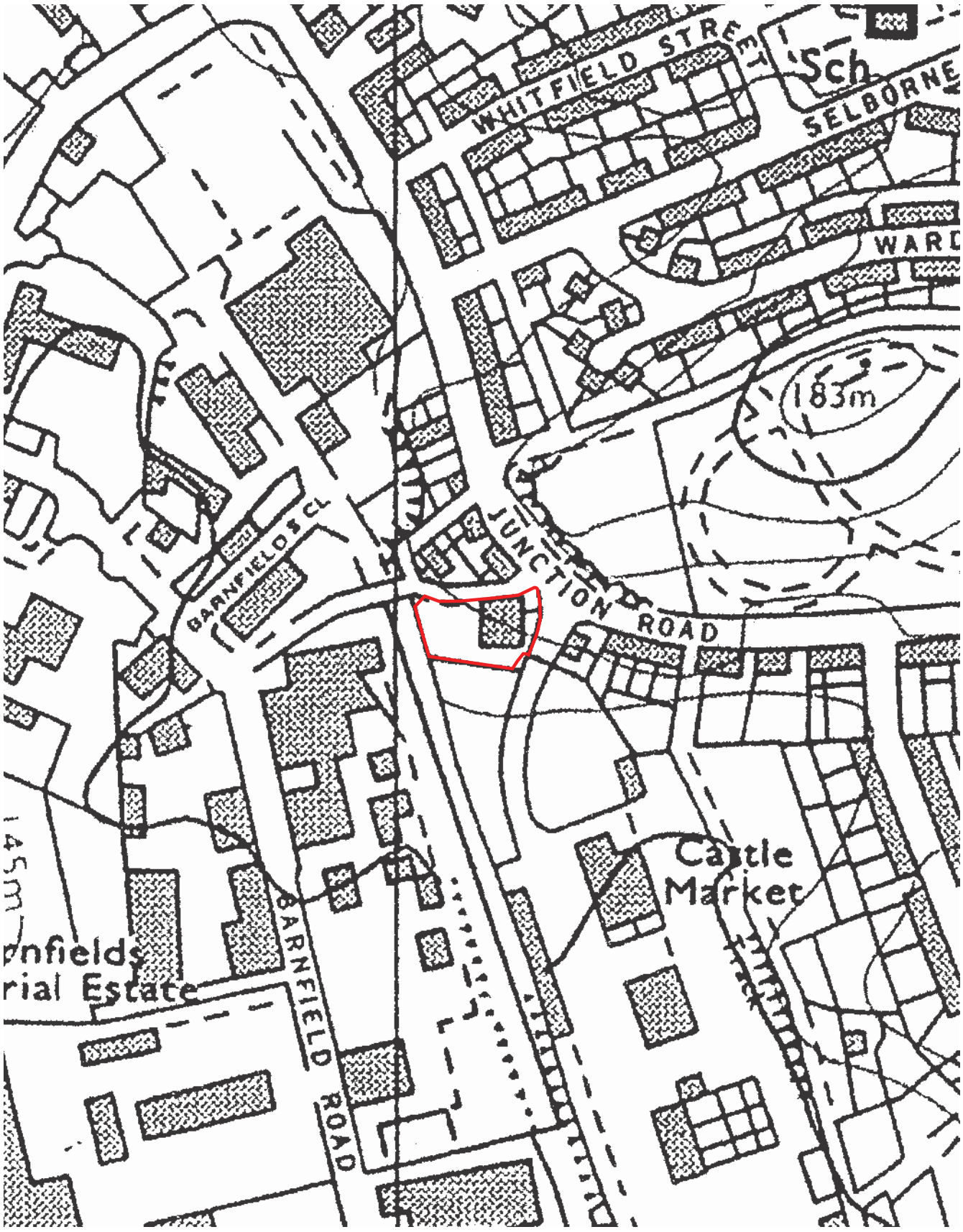
SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **A8**



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THE SITE AREA IN 1976

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THE SITE AREA IN 1993

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CURRENT MAP EDITION OF THE SITE AREA

SLADEN ASSOCIATES	Report No 17-1844	Project Former Moorlands Public House Junction Road Leek	Figure **A11**

APPENDIX B
FACTUAL INFORMATION CONCERNING NEARBY LAND USE

Enviro Insight

Address:	**FORMER MOORLANDS PUBLIC HOUSE, JUNCTION ROAD, LEEK, ST13 5QP**
Date:	**12 Oct 2017**
Reference:	**SA1-4342975**
Client:	**Sladen Associates Ltd**

NW N NE



W E

SW S SE

Aerial Photograph Capture date:	23-Apr-2015
Grid Reference:	398042,355684
Site Size:	0.16ha

Report Reference: SA1-4342975
Client Reference: 17-1844

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8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site: 56
8.8 Records of World Heritage Sites within 2000m of the study site: 56
8.9 Records of Environmentally Sensitive Areas within 2000m of the study site: 57

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site: 57
8.11 Records of National Parks (NP) within 2000m of the study site: 57
8.12 Records of Nitrate Sensitive Areas within 2000m of the study site: 57
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Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Section 1: Historical Industrial Sites	On-site	0-50	51-250	251-500
1.1 Potentially Contaminative Uses identified from 1:10,000 scale mapping	0	19	64	68
1.2 Additional Information – Historical Tank Database	0	2	7	42
1.3 Additional Information – Historical Energy Features Database	0	0	10	45
1.4 Additional Information – Historical Petrol and Fuel Site Database	0	0	0	0
1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database	0	0	0	8
1.6 Potentially Infilled Land	0	7	27	24

Section 2: Environmental Permits, Incidents and Registers	On-site	0-50m	51-250	251-500
2.1 Industrial Sites Holding Environmental Permits and/or Authorisations				
2.1.1 Records of historic IPC Authorisations	0	0	9	0
2.1.2 Records of Part A(1) and IPPC Authorised Activities	0	0	4	0
2.1.3 Records of Red List Discharge Consents	0	0	0	0
2.1.4 Records of List 1 Dangerous Substances Inventory sites	0	0	0	0
2.1.5 Records of List 2 Dangerous Substances Inventory sites	0	0	1	0
2.1.6 Records of Part A(2) and Part B Activities and Enforcements	0	0	1	5
2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0
2.1.8 Records of Licensed Discharge Consents	0	0	0	3
2.1.9 Records of Water Industry Referrals	0	0	0	0
2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site	0	0	0	1
2.2 Records of COMAH and NIHHS sites	0	0	0	1
2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents				
2.3.1 National Incidents Recording System, List 2	0	0	0	2
2.3.2 National Incidents Recording System, List 1	0	0	0	0
2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990	0	0	0	1

Section 3: Landfill and Other Waste Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-1500
3.1 Landfill Sites						
3.1.1 Environment Agency/Natural Resources Wales Registered Landfill Sites	0	0	0	0	0	Not searched
3.1.2 Environment Agency/Natural Resources Wales Historic Landfill Sites	0	0	1	1	0	5
3.1.3 BGS/DoE Landfill Site Survey	0	0	0	0	0	0
3.1.4 Records of Landfills in Local Authority and Historical Mapping Records	0	0	0	0	0	0
3.2 Landfill and Other Waste Sites Findings						
3.2.1 Operational and Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	1	0	Not searched	Not searched
3.2.2 Environment Agency/Natural Resources Wales Licensed Waste Sites	0	0	0	4	1	0

Section 4: Current Land Use

	On-site	0-50m	51-250	251-500
4.1 Current Industrial Sites Data	0	1	20	Not searched
4.2 Records of Petrol and Fuel Sites	0	0	0	2
4.3 National Grid Underground Electricity Cables	0	0	0	0
4.4 National Grid Gas Transmission Pipelines	0	0	0	0

Section 5: Geology

5.1 Are there any records of Artificial Ground and Made Ground present beneath the study site?	No
5.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site?	None
5.3 For records of Bedrock and Solid Geology beneath the study site see the detailed findings section.	

Section 6: Hydrogeology and Hydrology

	0-500m
6.1 Are there any records of Strata Classification in the Superficial Geology within 500m of the study site?	Yes
6.2 Are there any records of Strata Classification in the Bedrock Geology within 500m of the study site?	Yes

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
6.3 Groundwater Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	10
6.4 Surface Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	1	8
6.5 Potable Water Abstraction Licences (within 2000m of the study site)	0	0	0	0	0	3
6.6 Source Protection Zones (within 500m of the study site)	1	0	0	0	Not searched	Not searched
6.7 Source Protection Zones within Confined Aquifer	0	0	0	0	Not searched	Not searched
6.8 Groundwater Vulnerability and Soil Leaching Potential (within 500m of the study site)	1	0	0	2	Not searched	Not searched

Section 6: Hydrogeology and Hydrology

	0-500m					
	On-site	0-50m	51-250	251-500	501-1000	1000-1500
6.9 Is there any Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site?	No	No	No	No	Yes	No
6.10 Detailed River Network entries within 500m of the site	0	0	0	4	Not searched	Not searched
6.11 Surface water features within 250m of the study site	No	No	No	Not searched	Not searched	Not searched

Section 7: Flooding

7.1 Are there any Enviroment Agency Zone 2 floodplains within 250m of the study site?	No
7.2 Are there any Environment Agency/Natural Resources Wales Zone 3 floodplains within 250m of the study site	No
7.3 What is the Risk of flooding from Rivers and the Sea (RoFRaS) rating for the study site?	Very Low
7.4 Are there any Flood Defences within 250m of the study site?	No
7.5 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
7.6 Are there any areas used for Flood Storage within 250m of the study site?	No
7.7 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	Potential at Surface
7.8 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Low

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	0	0
8.2 Records of National Nature Reserves (NNR)	0	0	0	0	0	0
8.3 Records of Special Areas of Conservation (SAC)	0	0	0	0	0	0
8.4 Records of Special Protection Areas (SPA)	0	0	0	0	0	0
8.5 Records of Ramsar sites	0	0	0	0	0	0
8.6 Records of Ancient Woodlands	0	0	0	0	1	8
8.7 Records of Local Nature Reserves (LNR)	0	0	0	0	1	1
8.8 Records of World Heritage Sites	0	0	0	0	0	0
8.9 Records of Environmentally Sensitive Areas	0	0	0	0	0	2

Section 8: Designated Environmentally Sensitive Sites

	On-site	0-50m	51-250	251-500	501-1000	1000-2000
8.10 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	0	0
8.11 Records of National Parks	0	0	0	0	0	0
8.12 Records of Nitrate Sensitive Areas	0	0	0	0	0	0
8.13 Records of Nitrate Vulnerable Zones	0	0	0	0	0	0
8.14 Records of Green Belt land	0	0	0	0	1	0

Section 9: Natural Hazards

9.1 What is the maximum risk of natural ground subsidence?	Very Low
9.1.1 What is the maximum Shrink-Swell hazard rating identified on the study site?	Negligible
9.1.2 What is the maximum Landslides hazard rating identified on the study site?	Very Low
9.1.3 What is the maximum Soluble Rocks hazard rating identified on the study site?	Negligible
9.1.4 What is the maximum Compressible Ground hazard rating identified on the study site?	Negligible
9.1.5 What is the maximum Collapsible Rocks hazard rating identified on the study site?	Very Low
9.1.6 What is the maximum Running Sand hazard rating identified on the study site?	Negligible
9.2 Radon	
9.2.1 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.
9.2.2 Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary.

Section 10: Mining

10.1 Are there any coal mining areas within 75m of the study site?	No
10.2 Are there any Non-Coal Mining areas within 50m of the study site boundary?	No
10.3 Are there any brine affected areas within 75m of the study site?	No

Using this report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between Groundsure and the Client. The document contains the following sections:

1. Historical Industrial Sites

Provides information on past land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. Potentially Infilled Land features are also included. This search is conducted using radii of up to 500m.

2. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

3. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

4. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure gas pipelines and underground electricity transmission lines.

5. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

6. Hydrogeology and Hydrology

Provides information on productive strata within the bedrock and superficial geological layers, abstraction licenses, Source Protection Zones (SPZs) and river quality. These searches are conducted using radii of up to 2000m.

7. Flooding

Provides information on river and coastal flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

8. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites and Scheduled Ancient Woodland. These searches are conducted using radii of up to 2000m.

9. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence and radon..

10. Mining

Provides information on areas of coal and non-coal mining and brine affected areas.

11. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, Groundsure provide a free Technical Helpline (08444 159000) for further information and guidance.

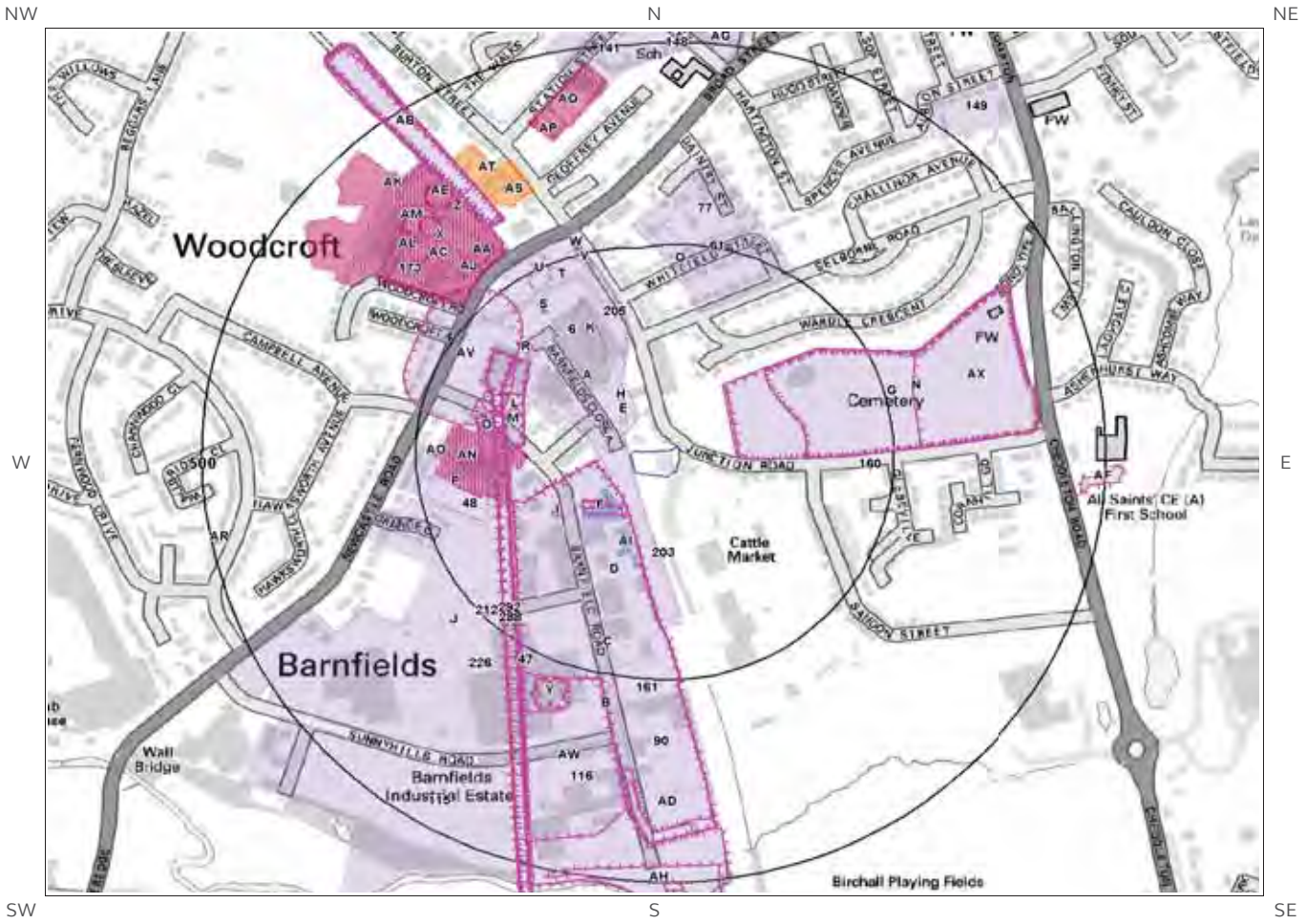
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier “A” on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as “Not Shown”.

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Historical Land Use



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Historical 1:10,000 and 1:10,560 scale mapping

Industrial Land Use

Potentially Infilled Land

Site Outline

Historical 1:2,500, 1:1,250 and 1:500 scale mapping

250
500
Search Buffers (m)

Energy Features

Petrol Stations

Tanks

Garages

1. Historical Industrial Sites

1.1 Potentially Contaminative Uses identified from 1:10,000 scale Mapping

The systematic analysis of data extracted from standard 1:10,560 and 1:10,000 scale historical maps provides the following information:

Records of sites with a potentially contaminative past land use within 500m of the search boundary: 151

ID	Distance [m]	Direction	Use	Date
1A	1	W	Railway Sidings	1938
2A	1	W	Railway Sidings	1945
3A	1	W	Railway Sidings	1879
4A	1	W	Railway Sidings	1923
5A	1	W	Railway Sidings	1966
6	10	NW	Railway Sidings	1898
7	21	W	Engine Shed	1898
8B	30	SW	Sewage Farm	1945
9B	30	SW	Sewage Farm	1898
10B	30	SW	Sewage Farm	1923
11C	30	SW	Sewage Farm	1938
12C	30	SW	Sewage Farm	1938
13D	34	SW	Unspecified Works	1974
14D	34	SW	Unspecified Commercial/Industrial	1992
15E	36	N	Railway Building	1945
16E	36	N	Railway Building	1923
17E	37	N	Railway Buildings	1938
18F	46	SW	Settling Tanks	1923
19F	47	SW	Settling Tanks	1945
20H	64	N	Railway Building	1898
21G	65	E	Cemetery	1992
22G	65	E	Cemetery	1966
23G	65	E	Cemetery	1974
24H	66	N	Railway Building	1945
25H	66	N	Railway Building	1923
26H	66	N	Railway Building	1879
27G	68	E	Cemetery	1923
28G	68	E	Cemetery	1945
29I	98	SW	Settling Tanks	1938
30I	98	SW	Settling Tanks	1938
31J	101	W	Industrial Estate	1974
32J	101	W	Industrial Estate	1992
33K	113	N	Railway Building	1966

34K	113	N	Goods Shed	1879
35K	113	N	Railway Building	1923
36K	113	N	Railway Building	1945
37K	115	N	Railway Building	1938
38L	123	W	Unspecified Wharf	1938
39L	123	W	Unspecified Wharf	1938
40M	124	W	Unspecified Wharf	1945
41M	124	W	Unspecified Wharf	1923
42L	125	W	Unspecified Wharf	1966
43K	127	N	Goods Shed	1898
44N	130	NE	Cemetery	1938
45N	130	NE	Cemetery	1898
46L	137	W	Unspecified Wharf	1898
47	141	SW	Unspecified Works	1974
48	152	W	Unspecified Depot	1974
49O	156	W	Unspecified Wharf	1938
50O	156	W	Unspecified Wharf	1938
51O	157	W	Unspecified Wharf	1945
52O	157	W	Unspecified Wharf	1923
53AV	158	NW	Unspecified Wharf	1879
54P	166	W	Iron and Brass Foundry	1938
55P	167	W	Iron and Brass Foundry	1923
56P	167	W	Iron and Brass Foundry	1945
57P	167	W	Iron and Brass Foundry	1966
58Q	168	N	Nursery	1923
59Q	168	N	Nursery	1945
60Q	168	N	Nursery	1898
61	169	N	Nursery	1938
62R	172	NW	Railway Building	1923
63R	172	NW	Railway Building	1945
64AN	175	W	Unspecified Wharf	1966
65S	198	NW	Railway Building	1923
66S	198	NW	Railway Building	1898
67S	198	NW	Railway Building	1945
68S	198	NW	Railway Building	1966
69S	199	NW	Railway Building	1938
70T	220	N	Railway Buildings	1966
71T	225	NW	Railway Station	1898
72U	227	NW	Railway Station	1966
73U	227	NW	Railway Station	1923
74U	227	NW	Railway Station	1945
75U	227	NW	Railway Station	1879
76U	228	NW	Railway Station	1938
77	228	N	Nursery	1879
78V	228	N	Railway Building	1945
79V	228	N	Railway Building	1879

80V	228	N	Railway Building	1923
81V	228	N	Railway Building	1938
82V	228	N	Railway Building	1966
83V	231	N	Railway Building	1898
84AW	258	S	Sewage Farm	1966
85W	259	N	Railway Building	1898
86W	260	N	Railway Building	1923
87W	260	N	Railway Building	1945
88AD	261	S	Unspecified Works	1992
89Y	265	S	Unspecified Tanks	1966
90	268	S	Unspecified Works	1974
91X	268	NW	Gas Works	1923
92X	268	NW	Unspecified Commercial/Industrial	1945
93Y	269	S	Filter Beds	1923
94Y	269	S	Filter Beds	1945
95Y	269	S	Filter Beds	1938
96Y	269	S	Filter Beds	1938
97X	269	NW	Unspecified Commercial/Industrial	1966
98AC	274	NW	Gas Works	1898
99X	275	NW	Unspecified Commercial/Industrial	1938
100X	279	NW	Gas Works	1879
101AX	280	E	Cemetery	1879
102Z	286	NW	Iron Foundry	1898
103Z	287	NW	Iron Foundry	1879
104AJ	289	NW	Gasometer	1879
105X	291	NW	Unspecified Commercial/Industrial	1992
106X	291	NW	Gas Holder Station	1974
107AA	295	NW	Gasometer	1879
108AA	296	NW	Unspecified Tank	1898
109AB	321	NW	Cuttings	1923
110AB	321	NW	Cuttings	1879
111AB	321	NW	Cuttings	1945
112AB	321	NW	Cuttings	1898
113AB	324	NW	Cuttings	1966
114AB	327	NW	Cuttings	1938
115	331	S	Industrial Estate	1992
116	334	S	Unspecified Works	1974
117AC	339	NW	Gasometer	1898
118AC	339	NW	Unspecified Tank	1945
119AC	339	NW	Unspecified Tank	1923
120X	340	NW	Unspecified Tanks	1938
121AC	341	NW	Unspecified Tank	1966
122X	352	NW	Unspecified Tank	1945

123X	352	NW	Gasometer	1898
124X	352	NW	Unspecified Tank	1923
125X	352	NW	Gasometer	1879
126X	354	NW	Unspecified Tank	1992
127X	354	NW	Unspecified Tank	1974
128X	354	NW	Unspecified Tank	1966
129AD	361	S	Refuse Heap	1945
130AD	361	S	Refuse Heap	1923
131Z	371	NW	Unspecified Tank	1945
132Z	371	NW	Gasometer	1923
133AB	372	NW	Cuttings	1974
134AB	372	NW	Cuttings	1992
135AE	372	NW	Unspecified Tank	1938
136AE	375	NW	Unspecified Tank	1974
137AE	375	NW	Unspecified Tank	1992
138AE	375	NW	Unspecified Tank	1966
139AD	379	S	Unspecified Heap	1938
140AD	379	S	Unspecified Heap	1938
141	433	N	Stone Yard	1898
142AF	472	E	Unspecified Ground Workings	1974
143AF	472	E	Unspecified Ground Workings	1992
144AG	476	N	Unspecified Mills	1923
145AG	476	N	Timber Yard	1898
146AH	480	S	Unspecified Heap	1992
147AH	480	S	Unspecified Heap	1974
148	484	N	Electric Power Station	1923
149	488	NE	Silk Mill	1879
150AH	500	S	Filter Beds	1938
151AH	500	S	Filter Beds	1938

1.2 Additional Information – Historical Tank Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical tanks within 500m of the search boundary: 51

ID	Distance (m)	Direction	Use	Date
152F	39	SW	Settling Tanks	1925
153F	46	SW	Unspecified Tank	1990
154AI	74	S	Tanks	1993
155AI	96	S	Tanks	1990

156D	100	S	Tanks	1993
157S	199	NW	Unspecified Tank	1968
158S	199	NW	Unspecified Tank	1965
159S	199	NW	Unspecified Tank	1989
160	220	E	Unspecified Tank	1937
161	262	S	Unspecified Tank	1993
162AC	266	NW	Gas Works	1925
163AL	274	NW	Gas Works	1965
164AC	274	NW	Gas Works	1968
165AC	275	NW	Gas Works	1989
166AC	276	NW	Gas Works	1879
167AC	276	NW	Gas Works	1899
168AC	281	NW	Gasholder Station	1971
169AJ	287	NW	Gasometers	1879
170AJ	287	NW	Gasometer	1899
171AC	329	NW	Unspecified Tank	1965
172AC	333	NW	Gasometers	1899
173	335	NW	Tanks	1965
174AC	338	NW	Gasometers	1925
175AC	338	NW	Tanks	1937
176AC	338	NW	Unspecified Tank	1925
177AC	340	NW	Gas Holder	1965
178X	341	NW	Unspecified Tank	1965
179X	349	NW	Gasometer	1879
180X	352	NW	Gasholder	1985
181X	352	NW	Gasholder	1990
182X	352	NW	Gas Holder	1971
183X	352	NW	Gas Holder	1965
184X	352	NW	Gas Holder	1968
185X	353	NW	Gasholder	1989
186AK	360	NW	Gas Works	1965
187AK	360	NW	Gas Works	1968
188Z	370	NW	Gasometer	1925
189Z	370	NW	Unspecified Tank	1937
190Z	372	NW	Gas Holder	1965
191Z	372	NW	Gas Holder	1971
192Z	372	NW	Gas Works	1968
193Z	372	NW	Gas Holder	1993
194Z	372	NW	Gasometer	1968
195Z	372	NW	Gas Holder	1985
196Z	373	NW	Gasometer	1965
197Z	373	NW	Unspecified Tank	1985
198Z	373	NW	Unspecified Tank	1990
199Z	373	NW	Gasholder	1989
200AM	376	NW	Unspecified Tank	1965
201AL	378	NW	Unspecified Tank	1965

202AM	386	NW	Unspecified Tank	1965

1.3 Additional Information – Historical Energy Features Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical energy features within 500m of the search boundary: 55

ID	Distance (m)	Direction	Use	Date
203	94	S	Electricity Substation	1993
204AN	118	W	Electricity Board Depot	1971
205	165	N	Electricity Substation	1990
206R	183	NW	Electricity Substation	1971
207R	183	NW	Electricity Substation	1985
208R	183	NW	Electricity Substation	1990
209AO	223	W	Electricity Substation	1971
210AO	225	W	Electricity Substation	1990
211AO	225	W	Electricity Substation	1985
212	242	SW	Electricity Substation	1993
213AC	266	NW	Gas Works	1925
214AL	274	NW	Gas Works	1965
215AC	274	NW	Gas Works	1968
216AJ	274	NW	Natural Gas Training Centre	1971
217AC	275	NW	Gas Works	1989
218AC	276	NW	Gas Works	1879
219AC	276	NW	Gas Works	1899
220AC	281	NW	Gasholder Station	1971
221AA	282	NW	Gas Works House	1989
222AA	283	NW	Gas Works House	1965
223AA	287	NW	Gasometers	1879
224AA	287	NW	Gasometer	1899
225AA	292	NW	Gas Works House	1968
226	298	SW	Electricity Substation	1987
227X	333	NW	Gasometers	1899
228X	338	NW	Gasometers	1925
229X	340	NW	Gas Holder	1965
230X	349	NW	Gasometer	1879
231X	352	NW	Gasholder	1985
232X	352	NW	Gasholder	1990
233X	352	NW	Gas Holder	1971
234X	352	NW	Gas Holder	1965
235X	352	NW	Gas Holder	1968
236X	353	NW	Gasholder	1989

237AK	360	NW	Gas Works	1965
238AK	360	NW	Gas Works	1968
239AE	370	NW	Gasometer	1925
240AE	372	NW	Gas Holder	1965
241AE	372	NW	Gas Holder	1971
242AE	372	NW	Gas Works	1968
243AE	372	NW	Gas Holder	1993
244AE	372	NW	Gasometer	1968
245AE	372	NW	Gas Holder	1985
246AE	373	NW	Gasometer	1965
247AE	373	NW	Gasholder	1989
248AQ	392	N	Electricity Board Depot	1968
249AP	395	N	Electricity Substation	1993
250AP	396	N	Electricity Substation	1985
251AQ	400	N	Electricity Board Depot	1965
252AQ	405	N	Electric Power Station	1925
253AP	415	N	Electricity Substation	1993
254AP	415	N	Electricity Substation	1985
255AR	487	W	Electricity Substation	1985
256AR	487	W	Electricity Substation	1990
257AR	488	W	Electricity Substation	1971

1.4 Additional Information – Historical Petrol and Fuel Site Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical petrol stations and fuel sites within 500m of the search boundary: 0

Database searched and no data found.

1.5 Additional Information – Historical Garage and Motor Vehicle Repair Database

The systematic analysis of data extracted from High Detailed 1:1,250 and 1:2,500 scale historical maps provides the following information.

Records of historical garage and motor vehicle repair sites within 500m of the search boundary: 8

ID	Distance (m)	Direction	Use	Date
258AS	334	NW	Garage	1965
259AS	334	NW	Garage	1993
260AS	334	NW	Garage	1985
261AS	334	NW	Garage	1968
262AT	355	NW	Garage	1985

263AS	355	NW	Garage	1965
264AS	355	NW	Garage	1968
265AT	361	NW	Garage	1993

1.6 Potentially Infilled Land

Records of Potentially Infilled Features from 1:10,000 scale mapping within 500m of the study site: 58

The following Historical Potentially Infilled Features derived from the Historical Mapping information is provided by Groundsure:

ID	Distance(m)	Direction	Use	Date
266B	30	SW	Sewage Farm	1945
267B	30	SW	Sewage Farm	1898
268B	30	SW	Sewage Farm	1923
269C	30	SW	Sewage Farm	1938
270C	30	SW	Sewage Farm	1938
271F	46	SW	Settling Tanks	1923
272F	47	SW	Settling Tanks	1945
273G	65	E	Cemetery	1992
274G	65	E	Cemetery	1974
275G	65	E	Cemetery	1966
276G	68	E	Cemetery	1945
277G	68	E	Cemetery	1923
278I	98	SW	Settling Tanks	1938
279I	98	SW	Settling Tanks	1938
280L	123	W	Unspecified Wharf	1938
281L	123	W	Unspecified Wharf	1938
282M	124	W	Unspecified Wharf	1923
283M	124	W	Unspecified Wharf	1945
284L	125	W	Unspecified Wharf	1966
285N	130	NE	Cemetery	1938
286N	130	NE	Cemetery	1898
287L	137	W	Unspecified Wharf	1898
288	141	W	Canal	1938
289AU	141	W	Canal	1923
290AU	141	W	Canal	1945
291AU	141	W	Canal	1898
292	141	W	Canal	1879
293Y	144	W	Canal	1966
294O	156	W	Unspecified Wharf	1938
295O	156	W	Unspecified Wharf	1938
296O	157	W	Unspecified Wharf	1923
297O	157	W	Unspecified Wharf	1945
298AV	158	NW	Unspecified Wharf	1879
299AN	175	W	Unspecified Wharf	1966
300AW	258	S	Sewage Farm	1966

301Y	269	S	Filter Beds	1923
302Y	269	S	Filter Beds	1945
303Y	269	S	Filter Beds	1938
304Y	269	S	Filter Beds	1938
305AX	280	E	Cemetery	1879
306AB	321	NW	Cuttings	1898
307AB	321	NW	Cuttings	1923
308AB	321	NW	Cuttings	1945
309AB	321	NW	Cuttings	1879
310AB	324	NW	Cuttings	1966
311AB	327	NW	Cuttings	1938
312AD	361	S	Refuse Heap	1923
313AD	361	S	Refuse Heap	1945
314AB	372	NW	Cuttings	1974
315AB	372	NW	Cuttings	1992
316AD	379	S	Unspecified Heap	1938
317AD	379	S	Unspecified Heap	1938
318AF	472	E	Unspecified Ground Workings	1974
319AF	472	E	Unspecified Ground Workings	1992
320AH	480	S	Unspecified Heap	1992
321AH	480	S	Unspecified Heap	1974
322AH	500	S	Filter Beds	1938
323AH	500	S	Filter Beds	1938

2. Environmental Permits, Incidents and Registers Map



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Site Outline

250
500
Search Buffers (m)

Recorded Pollution Incident

Dangerous Substances (List 1)

Dangerous Substances (List 2)

Water Industry Referrals

Licenced Discharge Consents

Red List Discharge Consents

RAS 3 & 4 Authorisations

Part A(1) Authorised Processes and Historic IPC Authorisations

Part A(2) and Part B Authorised Processes

COMAH / NIHHS Sites

Sites Determined as Contaminated Land

Hazardous Substance Consents and Enforcements

2. Environmental Permits, Incidents and Registers

2.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency/Natural Resources Wales and Local Authorities reveal the following information:

2.1.1 Records of historic IPC Authorisations within 500m of the study site:

9

The following IPC Authorisations are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
33B	126	S	397980 355550	Operator: Croda Leek Ltd Address: Barnfield Road, Leek, Staffordshire, ST13 5QJ Process: Manufacture And Use Of Organic Chemicals	Permit Number: AX1344 Original Permit Number: IPCMINVAR Date Approved: 17-11-1997 Effective Date: 18-11-1997 Status: Superseded By Variation
34B	126	S	397980 355550	Operator: Croda Leek Ltd Address: Barnfield Road, Leek, Staffordshire, ST13 5QJ Process: Manufacture And Use Of Organic Chemicals	Permit Number: BA7425 Original Permit Number: IPCMINVAR Date Approved: 6-7-1998 Effective Date: 6-7-1998 Status: Superseded By Variation
35B	126	S	397980 355550	Operator: Croda Leek Ltd Address: Barnfield Road, Leek, Staffordshire, ST13 5QJ Process: Manufacture And Use Of Organic Chemicals	Permit Number: AU1801 Original Permit Number: IPCMAJVAR Date Approved: 28-2-1996 Effective Date: 1-3-1996 Status: Superseded By Variation
36B	126	S	397980 355550	Operator: Croda Leek Ltd Address: Barnfield Road, Leek, Staffordshire, ST13 5QJ Process: Manufacture And Use Of Organic Chemicals	Permit Number: BF8984 Original Permit Number: IPCMINVAR Date Approved: 6-7-1999 Effective Date: 6-7-1999 Status: Superseded By Variation
37B	126	S	397980 355550	Operator: Croda Leek Ltd Address: Barnfield Road, Leek, Staffordshire, ST13 5QJ Process: Manufacture And Use Of Organic Chemicals	Permit Number: AK0898 Original Permit Number: IPCAIRAPP Date Approved: 7-2-1994 Effective Date: 7-2-1994 Status: Superseded By Variation
38B	126	S	397980 355550	Operator: Croda Leek Ltd Address: Barnfield Road, Leek, Staffordshire, ST13 5QJ Process: Manufacture And Use Of Organic Chemicals	Permit Number: BE3448 Original Permit Number: IPCMINVAR Date Approved: 24-11-1998 Effective Date: 30-11-1998 Status: Superseded By Variation

ID	Distance (m)	Direction	NGR	Details	
39B	126	S	397980 355550	Operator: Croda Leek Ltd Address: Barnfield Road, Leek, Staffordshire, ST13 5QJ Process: Manufacture And Use Of Organic Chemicals	Permit Number: BH2081 Original Permit Number: IPCMINVAR Date Approved: 9-5-2000 Effective Date: 9-5-2000 Status: Superseded By Variation
40B	126	S	397980 355550	Operator: Croda Leek Ltd Address: Barnfield Road, Leek, Staffordshire, ST13 5QJ Process: Manufacture And Use Of Organic Chemicals	Permit Number: BJ3691 Original Permit Number: IPCMINVAR Date Approved: 26-1-2001 Effective Date: 31-1-2001 Status: Superseded By Variation
41B	126	S	397980 355550	Operator: Croda Leek Ltd Address: Barnfield Road, Leek, Staffordshire, ST13 5QJ Process: Manufacture And Use Of Organic Chemicals	Permit Number: BM5399 Original Permit Number: IPCMINVAR Date Approved: 4-1-2002 Effective Date: 4-1-2002 Status: Revoked - Now Ippc

2.1.2 Records of Part A(1) and IPPC Authorised Activities within 500m of the study site:

4

The following Part A(1) and IPPC Authorised Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
29B	126	S	397980 355550	Operator: Croda Chemicals International Ltd Installation Name: Barnfield Road Chemical Works Leek Process: ORGANIC CHEMICALS; OXYGEN CONTAINING COMPOUNDS EG ALCOHOLS	Permit Number: BT8155ID Original Permit Number: BT8155ID EPR Reference: - Issue Date: 2/4/2004 Effective Date: 2/4/2004 Last date noted as effective: 2017-04-01 Status: Superceded
30B	126	S	397980 355550	Operator: Croda Leek Ltd Installation Name: - Process: ORGANIC CHEMICALS; OXYGEN CONTAINING COMPOUNDS EG ALCOHOLS	Permit Number: BT8155 Original Permit Number: BT8155 EPR Reference: - Issue Date: - Effective Date: - Last date noted as effective: 2004-10-01 Status: Superseded By Pas
31B	126	S	397980 355550	Operator: Croda Europe Ltd Installation Name: Barnfield Road Chemical Works Leek Process: ORGANIC CHEMICALS; OXYGEN CONTAINING COMPOUNDS EG ALCOHOLS	Permit Number: YP3731TR Original Permit Number: BT8155ID EPR Reference: - Issue Date: 16/3/2011 Effective Date: 16/3/2011 Last date noted as effective: 2017-04-01 Status: Effective
32B	126	S	397980 355550	Operator: Croda Chemicals International Ltd Installation Name: Barnfield Road Chemical Works Leek Process: ORGANIC CHEMICALS; OXYGEN CONTAINING COMPOUNDS EG ALCOHOLS	Permit Number: RP3836UB Original Permit Number: BT8155ID EPR Reference: - Issue Date: 9/8/2007 Effective Date: 9/8/2007 Last date noted as effective: 2017-04-01 Status: Superceded

2.1.3 Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site:

0

Database searched and no data found.

2.1.4 Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site:

0

Database searched and no data found.

2.1.5 Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site:

1

The following List 2 Dangerous Substance Inventory Site records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
4	72	S	398000 355600	Name: Croda Universal Ltd, Barnfield Road Status: Not Active Receiving Water: -	Authorised Substances: Copper, Zinc

2.1.6 Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site:

6

The following Part A(2) and Part B Activities are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
21	107	NW	397916 355739	Address: Hughes Concrete Ltd, Barnfields, Leek, Staffs, ST13 5QG Process: Cement and lime Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
22	276	SW	397800 355500	Address: F Ball & Co Barnfields Est Process: Coating & Enamelling Process Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
23	288	S	398016 355379	Address: CPM Ltd, Barnfields, Leek, Staffs, ST13 5QG Process: Use of Bulk Cement Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

ID	Distance (m)	Direction	NGR	Details	
24	347	NW	397882 356016	Address: Moorland Garage Services Ltd, Burton Street, Leek, Staffs, ST13 8BU Process: Small Waste Oil Burners Status: New Legislation Applies Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
25C	372	NW	397861 356037	Address: Cruso Auto Repairs, Station Garage, Burton Street, Leek, ST13 8BU Process: Waste Oil Burner Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified
26C	372	NW	397861 356037	Address: Station Garage, Burton Street, Leek, ST13 8BU Process: Waste Oil Burner Status: Historical Permit Permit Type: Part B	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcements Notified Comment: No Enforcements Notified

2.1.7 Records of Category 3 or 4 Radioactive Substances Authorisations:

0

Database searched and no data found.

2.1.8 Records of Licensed Discharge Consents within 500m of the study site:

3

The following Licensed Discharge Consents records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
5	303	N	398000 356000	Address: NEW HOUSE FARM, BOTTOM HOUSE, NR LEEK, . Effluent Type: SEWAGE & TRADE COMBINED - UNSPECIFIED Permit Number: DT/6342 Permit Version: 1	Receiving Water: TRIB OF RIVER CHURNET Status: 1961 R(PP)A APPLICATION REFUSED Issue date: 28/05/1963 Effective Date: 28-May-1963 Revocation Date: 19/09/2000
6A	466	S	398100 355200	Address: OLD STATION YARD, (OUTLET A), NR LEEK, STAFFORDSHIRE Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: T/30/03561/O Permit Version: 2	Receiving Water: RIVER CHURNET Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 23/05/2001 Effective Date: 23-May-2001 Revocation Date: -
7A	466	S	398100 355200	Address: OLD STATION YARD, (OUTLET A), NR LEEK, STAFFORDSHIRE Effluent Type: SEWAGE DISCHARGES - SEWER STORM OVERFLOW - WATER COMPANY Permit Number: T/30/03561/O Permit Version: 1	Receiving Water: RIVER CHURNET Status: PRE NRA LEGISLATION WHERE ISSUE DATE < 01-SEP-89 (HISTORIC ONLY) Issue date: 05/07/1973 Effective Date: 05-Jul-1973 Revocation Date: 22/05/2001

2.1.9 Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site:

0

Database searched and no data found.

2.1.10 Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site:

1

The following records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	Application Reference Number	NGR	Application Status	Application Date	Address	Details	Details of Enforcement Action
42D	365	NW	SM92-1248	397776 355973	Approved	No Details	Transco Plc, formerly British Gas, Leek Gasholder Station, Woodcroft Road, Leek, ST13 5QD	Storage Facilities For Natural Gas (application For Deemed Consent Under Hazardous Substances Act).	Enforcement: No Enforcements Notified Date of Enforcement: No Enforcement Notified Comment: No Enforcement Notified

---

2.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 1

The following COMAH & NIHHS Authorisation records provided by the Health and Safety Executive are represented as polygons or buffered points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	Company	Address	Operational Status	Tier
27	324	NW	British Gas	British Gas, Leek Holder Station, Woodcroft Road, Leek, ST13 5QD	Historical NIHHS Site	-

---

2.3 Environment Agency/Natural Resources Wales Recorded Pollution Incidents

2.3.1 Records of National Incidents Recording System, List 2 within 500m of the study site:

2

The following NIRS List 2 records are represented as points on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Details	
1	470	S	397880 355220	Incident Date: 05-Jan-2003 Incident Identification: 129317 Pollutant: Sewage Materials Pollutant Description: Grey Water	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2	474	S	398002 355193	Incident Date: 28-Jun-2003 Incident Identification: 169626 Pollutant: Contaminated Water Pollutant Description: Firefighting Run-Off	Water Impact: Category 4 (No Impact) Land Impact: Category 3 (Minor) Air Impact: Category 3 (Minor)

2.3.2 Records of National Incidents Recording System, List 1 within 500m of the study site:

0

Database searched and no data found.

2.4 Sites Determined as Contaminated Land under Part 2A EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? 1

The following records are represented as polygons on the Environmental Permits, Incidents and Registers Map:

ID	Distance (m)	Direction	NGR	Description	Location	Category	Year Identified
3	267	NW	397772 355966	Former tar tank, as part of historic gas works.	4 Newcastle Road, Leek, Staffordshire, ST13 5QD	Contaminated Land	2007

3. Landfill and Other Waste Sites Map



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3. Landfill and Other Waste Sites

3.1 Landfill Sites

3.1.1 Records from Environment Agency/Natural Resources Wales landfill data within 1000m of the study site:

0

Database searched and no data found.

3.1.2 Records of Environment Agency/Natural Resources Wales historic landfill sites within 1500m of the study site:

7

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
2	155	S	398000 355400	Site Address: Croda Leek Limited, Barnfield Road, Leek, Staffordshire Waste Licence: Yes Site Reference: 1/D/77/0118, WDL/C01, 9999/9961 Waste Type: Inert, Industrial, Commercial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 11-Oct-1977 Licence Surrendered: 01-Oct-1980 Licence Holder Address: Barnfield Road, Leek, Staffordshire Operator: - Licence Holder: Croda Leek Limited First Recorded: 31-Dec-1960 Last Recorded: 01-Oct-1980
3	433	NW	397700 356100	Site Address: Rear Of Station Garage, Burton Street, Leek, Staffordshire Waste Licence: Yes Site Reference: C38, 1/A/89/0313, 9999/9983 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 04-Jan-1989 Licence Surrendered: 25-Apr-1994 Licence Holder Address: Burton Street, Leek, Staffordshire Operator: - Licence Holder: C and C Diesels First Recorded: - Last Recorded: -
Not shown	1072	S	398000 354500	Site Address: Leek Water Reclamation Works, Northern Site, Leekbrook, Leek, Staffordshire Waste Licence: Yes Site Reference: B67, 1/A/92/0420, 9999/9978 Waste Type: Inert Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 01-Apr-1992 Licence Surrendered: 25-Mar-1993 Licence Holder Address: Alexander House, 4 Station Road, Cheadle Hulme Operator: - Licence Holder: Birse Construction Limited First Recorded: 16-Apr-1992 Last Recorded: 05-Nov-1992

ID	Distance (m)	Direction	NGR	Details	
Not shown	1248	S	397600 354300	Site Address: Wallgrange Farm, Land Adjacent To Soils Wood, Leekbrook, Part Of Wallgrange Farm Waste Licence: Yes Site Reference: B58, 1/A/91/0368, 9999/9979 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 24-Jul-1991 Licence Surrendered: 20-May-1992 Licence Holder Address: Alexander House, 4 Station Road, Cheadle Hulme Operator: - Licence Holder: Birse Construction Limited First Recorded: 24-Jul-1991 Last Recorded: 14-Oct-1991
Not shown	1347	S	398100 354100	Site Address: Leek Sewage Works, Leekbrook, Staffordshire Waste Licence: - Site Reference: STAFFORDSHIRE MOORLANDS 63, 9999/9373 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: 31-Dec-1971 Last Recorded: 31-Dec-1972
Not shown	1384	NE	398800 356800	Site Address: British Trimmings, Ball Haye Road, Leek, Staffordshire Waste Licence: Yes Site Reference: 1/E/77/0009, WDL/B03, 9999/9957 Waste Type: Inert, Industrial, Commercial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: 16-Mar-1977 Licence Surrendered: 14-Jan-1993 Licence Holder Address: Ball Haye Road, Leek, Staffordshire Operator: - Licence Holder: British Trimmings (Leek) Limited First Recorded: 31-Dec-1977 Last Recorded: 31-Dec-1992
Not shown	1440	S	398100 354100	Site Address: Leek Sewage Works, Leekbrook, Staffordshire Waste Licence: - Site Reference: STAFFORDSHIRE MOORLANDS 63, 9999/9373 Waste Type: Inert, Industrial Environmental Permitting Regulations (Waste) Reference: -	Licence Issue: Licence Surrendered: Licence Holder Address: - Operator: - Licence Holder: - First Recorded: 31-Dec-1971 Last Recorded: 31-Dec-1972

3.1.3 Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

0

Database searched and no data found.

3.1.4 Records of Landfills from Local Authority and Historical Mapping Records within 1500m of the study site:

0

Database searched and no data found.

3.2 Other Waste Sites

3.2.1 Records of waste treatment, transfer or disposal sites within 500m of the study site:

1

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details		
1	105	W	397899 355739	Type of Site: Scrap Metal Yard Site Address: N/A	Planning Application Reference: N/A Date: 1971	Further Details: N/A Data Source: Historic Mapping Data Type: Polygon

3.2.2 Records of Environment Agency/Natural Resources Wales licensed waste sites within 1500m of the study site:

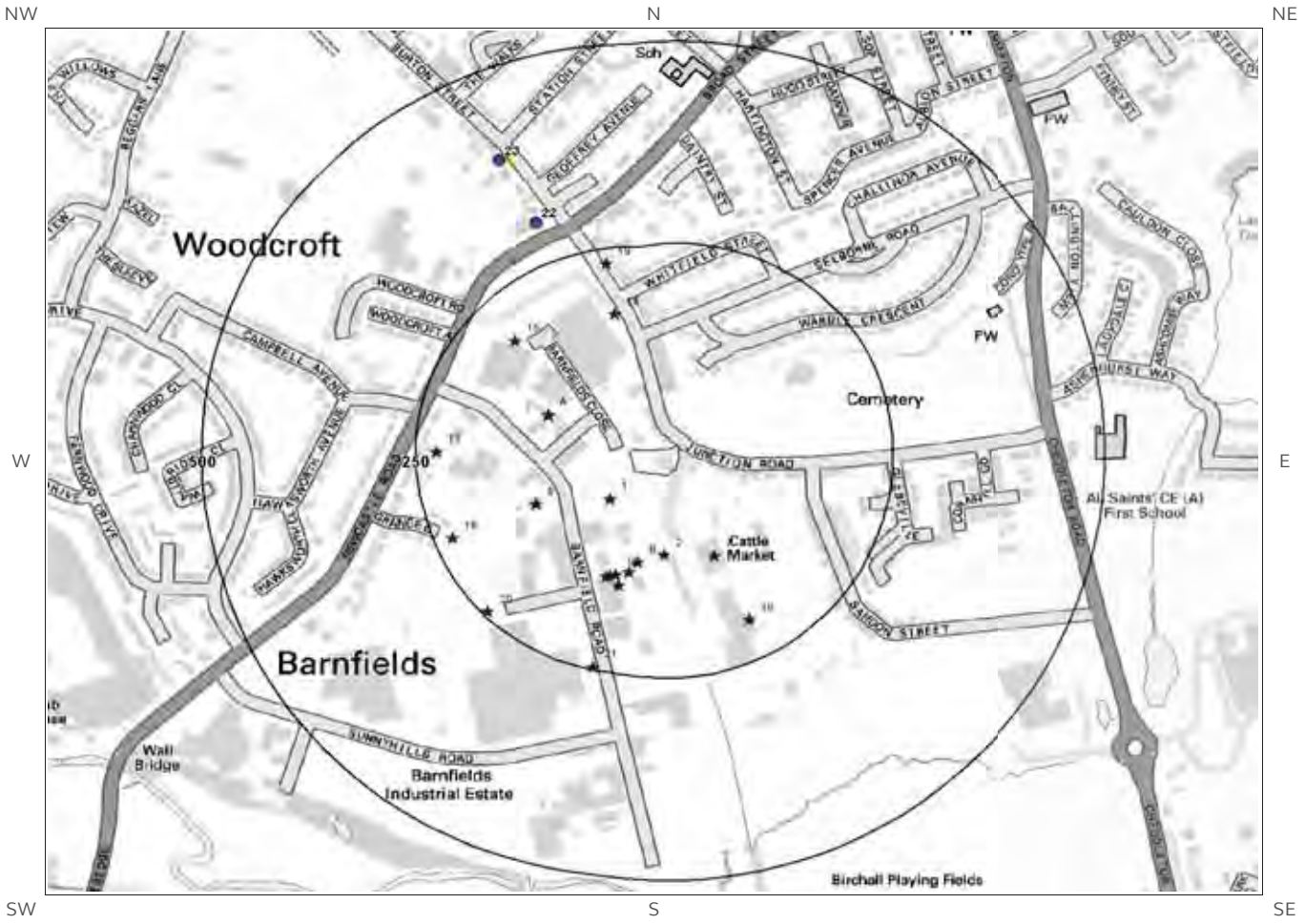
5

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance (m)	Direction	NGR	Details	
9A	470	S	398012 355196	Site Address: The Scrap Yard, Barnfield Ind Est, Leek, Staffordshire, ST13 5QG Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BES012 EPR reference: EA/EPR/FB3934RM/T001 Operator: R Bestwick & Sons Ltd Waste Management licence No: 42177 Annual Tonnage: 24999.0	Issue Date: 20/11/1991 Effective Date: 23/04/2012 Modified: - Surrendered Date: 0 Expiry Date: 0 Cancelled Date: 0 Status: Transferred Site Name: The Scrap Yard Correspondence Address: -
10A	470	S	398012 355196	Site Address: Barnfields Ind Est, Barnfield Road, Leek, Staffordshire, ST13 5QG Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BES002 EPR reference: EA/EPR/AP3596FW/A001 Operator: Bestwick Messrs Reginald And Robert Waste Management licence No: 42177 Annual Tonnage: 25000.0	Issue Date: 20/11/1991 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: R Beswick & Sons Correspondence Address: -
11A	470	S	398012 355196	Site Address: The Scrap Yard, Barnfields Industrial Est, Leek, Staffordshire, ST13 5QG Type: Metal Recycling Site (mixed MRS's) Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BES002 EPR reference: - Operator: Bestwick Messrs Rejinald And Robert Waste Management licence No: 42177 Annual Tonnage: 0.0	Issue Date: 20/11/1991 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: R Beswick & Sons Correspondence Address: 20, Westminster Road, Leek, Staffordshire, ST13 6PA

ID	Distance (m)	Direction	NGR	Details	
12	483	S	398074 355181	Site Address: The Old Coal Yard, Barnfield Road, Barnfields Ind Est, Leek, Staffordshire, ST13 5QJ Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: CHO013 EPR reference: EA/EPR/KP3098VZ/A001 Operator: 1st Choice Waste And Metals Ltd Waste Management licence No: 101798 Annual Tonnage: 24999.0	Issue Date: 28/09/2010 Effective Date: - Modified: - Surrendered Date: 0 Expiry Date: 0 Cancelled Date: 0 Status: Issued Site Name: The Old Coal Yard Correspondence Address: -
13	509	SW	397618 355355	Site Address: Sunnyhills Road, Barnfields Ind Est, Leek, Staffordshire, ST13 5RJ Type: Household, Commercial & Industrial Waste T Stn Size: < 25000 tonnes Environmental Permitting Regulations (Waste) Licence Number: BES001 EPR reference: EA/EPR/FP3896FM/V002 Operator: Bestwick Mr R Waste Management licence No: 42001 Annual Tonnage: 24999.0	Issue Date: 18/01/1990 Effective Date: - Modified: 13/01/2003 Surrendered Date: 0 Expiry Date: 0 Cancelled Date: 0 Status: Suspended Site Name: L W D Waste Services Correspondence Address: -

4. Current Land Use Map



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Site Outline

Search Buffers (m)
250
500

Current Industrial Sites

Petrol & Fuel Sites

Electricity Transmission Cables

Gas Transmission Pipelines

4. Current Land Uses

4.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site: 21

The following records are represented as points on the Current Land Uses map.

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
1	45	SW	Tank	397988 355636	ST13	Tanks (Generic)	Industrial Features
2	97	S	Electricity Sub Station	398051 355567	ST13	Electrical Features	Infrastructure and Facilities
3A	107	NW	Timeline Components	397915 355740	Barnfield Road Industrial Estate, Leek, ST13 5QG	Electrical Components	Industrial Products
4A	107	NW	Leek Tyre & Exhaust Centre	397915 355740	Barnfield Road Industrial Estate, Leek, ST13 5QG	Vehicle Repair, Testing and Servicing	Repair and Servicing
5A	107	NW	Tyrefit	397915 355740	Barnfield Road Industrial Estate, Leek, ST13 5QG	Vehicle Parts and Accessories	Motoring
6B	110	S	Tank	398020 355558	ST13	Tanks (Generic)	Industrial Features
7	112	SE	Leek Auctions Ltd	398109 355565	Cattle Market, Junction Road, Leek, ST13 5PY	Livestock Markets	Food, Drink and Multi Item Retail
8	123	W	S S Auto Care	397901 355630	Barnfield Road Industrial Estate, Leek, ST13 5QG	Vehicle Repair, Testing and Servicing	Repair and Servicing
9B	124	S	Barnfields Industrial Estate	398010 355546	ST13	Business Parks and Industrial Estates	Industrial Features
10C	129	S	Tank	397995 355543	ST13	Tanks (Generic)	Industrial Features
11C	131	S	Tank	397988 355542	ST13	Tanks (Generic)	Industrial Features
12C	133	S	Tank	397984 355541	ST13	Tanks (Generic)	Industrial Features
13C	141	S	Tank	397998 355530	ST13	Tanks (Generic)	Industrial Features
14	169	N	Electricity Sub Station	397994 355865	ST13	Electrical Features	Infrastructure and Facilities
15	193	NW	Electricity Sub Station	397877 355832	ST13	Electrical Features	Infrastructure and Facilities
16	201	SE	Cattle Market	398151 355487	ST13	Livestock Markets	Food, Drink and Multi Item Retail
17	226	W	Electricity Sub Station	397785 355695	ST13	Electrical Features	Infrastructure and Facilities
18	229	W	Pumping Station	397804 355588	ST13	Water Pumping Stations	Industrial Features
19	232	N	Electricity Sub Station	397984 355927	ST13	Electrical Features	Infrastructure and Facilities

ID	Distance (m)	Direction	Company	NGR	Address	Activity	Category
20	244	SW	Electricity Sub Station	397845 355497	ST13	Electrical Features	Infrastructure and Facilities
21	246	S	Electricity Sub Station	397968 355429	ST13	Electrical Features	Infrastructure and Facilities

4.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site: 2

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance (m)	Direction	NGR	Company	Address	LPG	Status
22	302	N	397901 355976	Morrisons	Morrisons Leek, Barnfield Close, Barnfield Close, Leek, Staffordshire, ST13 5EG	No	Open
23	389	NW	397859 356053	Uk	Cruso Auto Repairs Ltd, Burton Street, Burton Street, Leek, Staffordshire, ST13 8BU	No	Closed

4.3 National Grid High Voltage Underground Electricity Transmission Cables

This dataset identifies the high voltage electricity transmission lines running between generating power plants and electricity substations. The dataset does not include the electricity distribution network (smaller, lower voltage cables distributing power from substations to the local user network). This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high voltage underground electricity transmission cables within 500m of the study site: 0

Database searched and no data found.

4.4 National Grid High Pressure Gas Transmission Pipelines

This dataset identifies high-pressure, large diameter pipelines which carry gas between gas terminals, power stations, compressors and storage facilities. The dataset does not include the Local Transmission System (LTS) which supplies gas directly into homes and businesses. This information has been extracted from databases held by National Grid and is provided for information only with no guarantee as to its completeness or accuracy. National Grid do not offer any warranty as to the accuracy of the available data and are excluded from any liability for any such inaccuracies or errors.

Records of National Grid high pressure gas transmission pipelines within 500m of the study site: 0

Database searched and no data found.

5. Geology

5.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.2 Superficial Ground and Drift Geology

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

5.3 Bedrock and Solid Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
CHES-PESST	CHESTER FORMATION	SANDSTONE, PEBBLY (GRAVELLY)

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

6 Hydrogeology and Hydrology

6a. Aquifer Within Superficial Geology



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Site Outline

250 — 500 — Search Buffers (m)

Principal Aquifer

Secondary (A) Aquifer - Permeable Layers

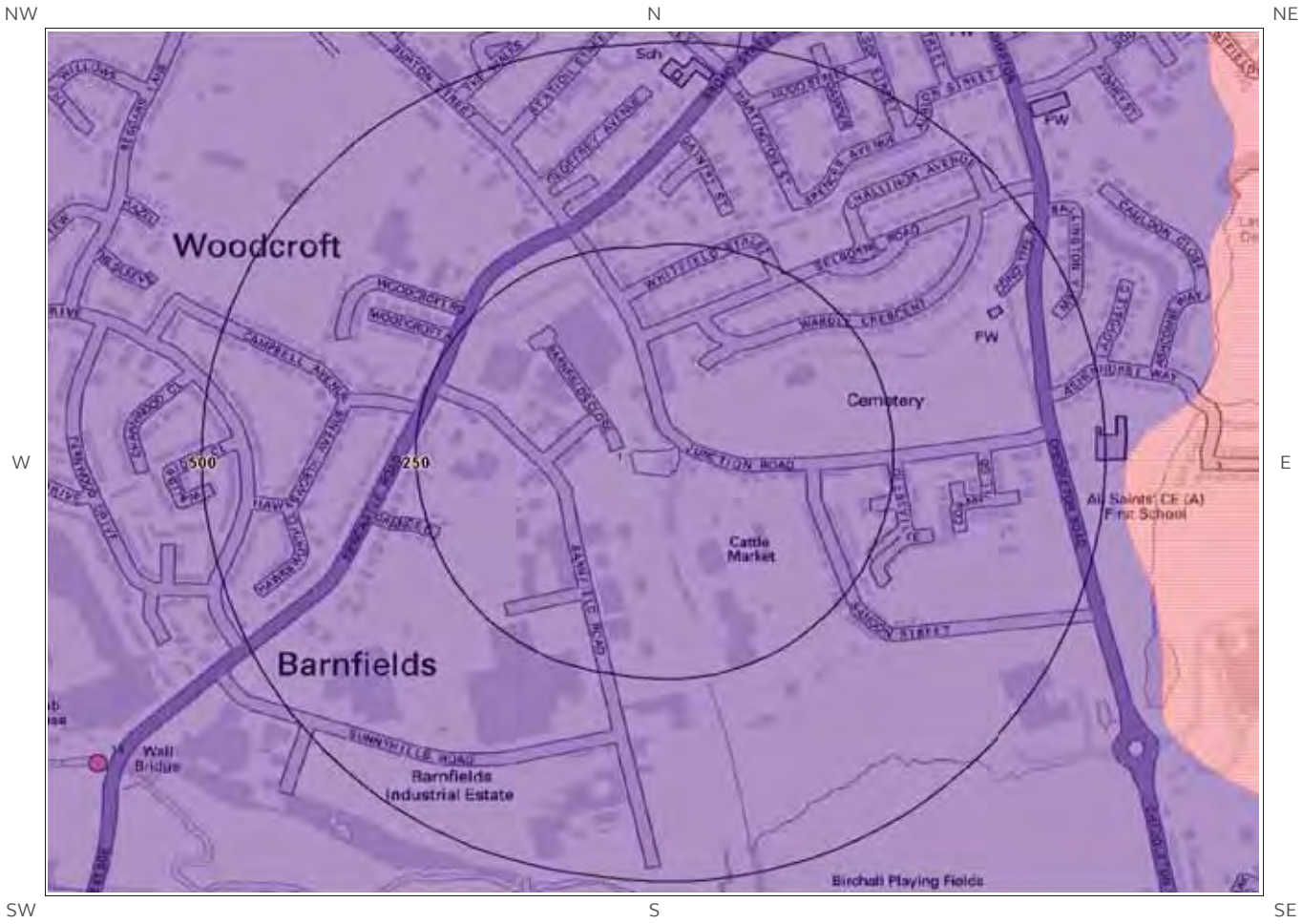
Secondary (B) Aquifer - Lower Permeability Layers

Secondary Aquifer - Undifferentiated Layers

Unproductive

Unknown (lakes and landslip)

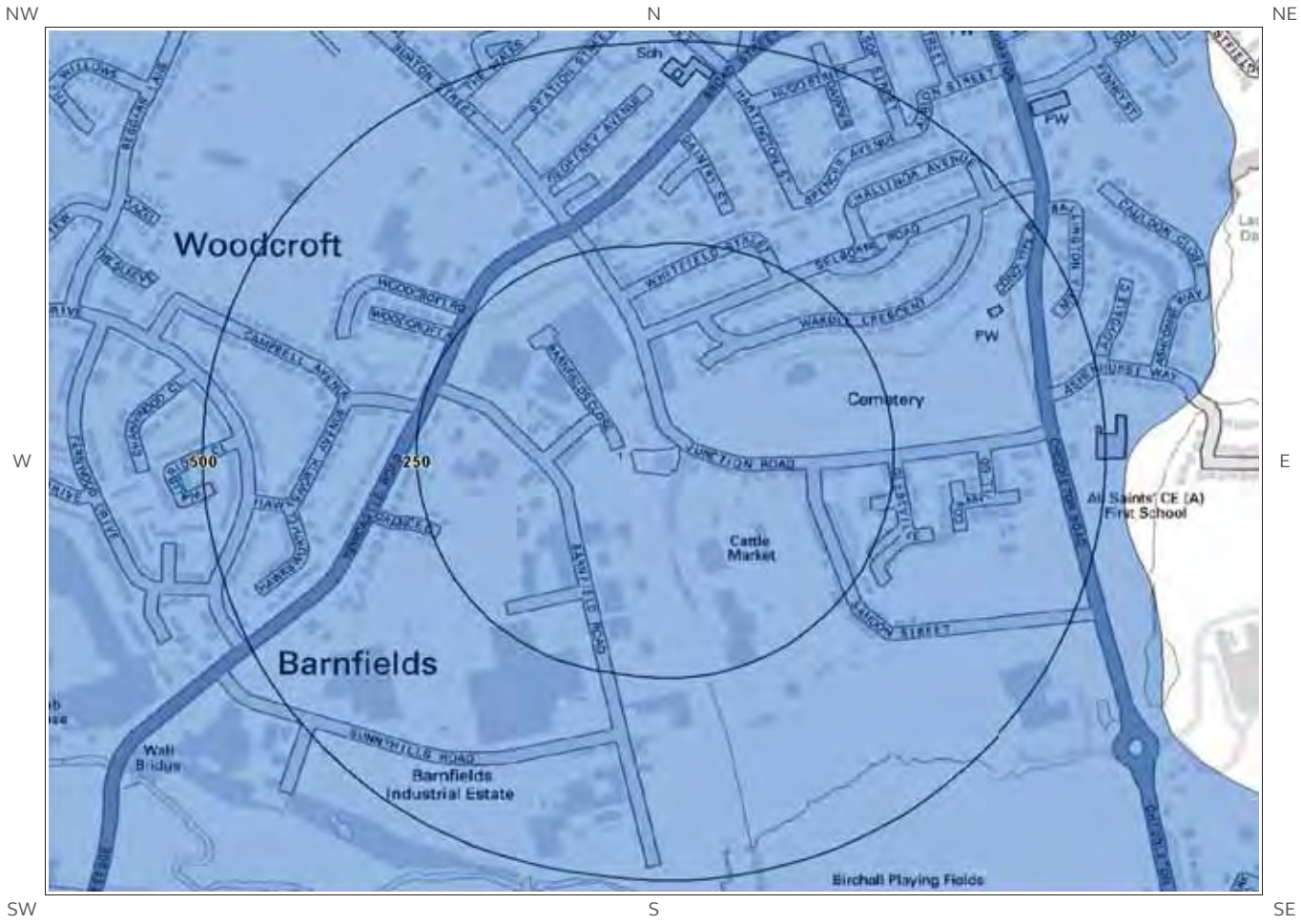
6b. Aquifer Within Bedrock Geology and Abstraction Licenses



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Site Outline
250
500
Search Buffers (m)
Principal Aquifer
Secondary (A) Aquifer - Permeable Layers
Secondary (B) Aquifer - Lower Permeability Layers
Groundwater Abstraction Licence
Secondary Aquifer - Undifferentiated Layers
Unproductive
Unknown (lakes and landslip)
Surface Water Abstraction Licence

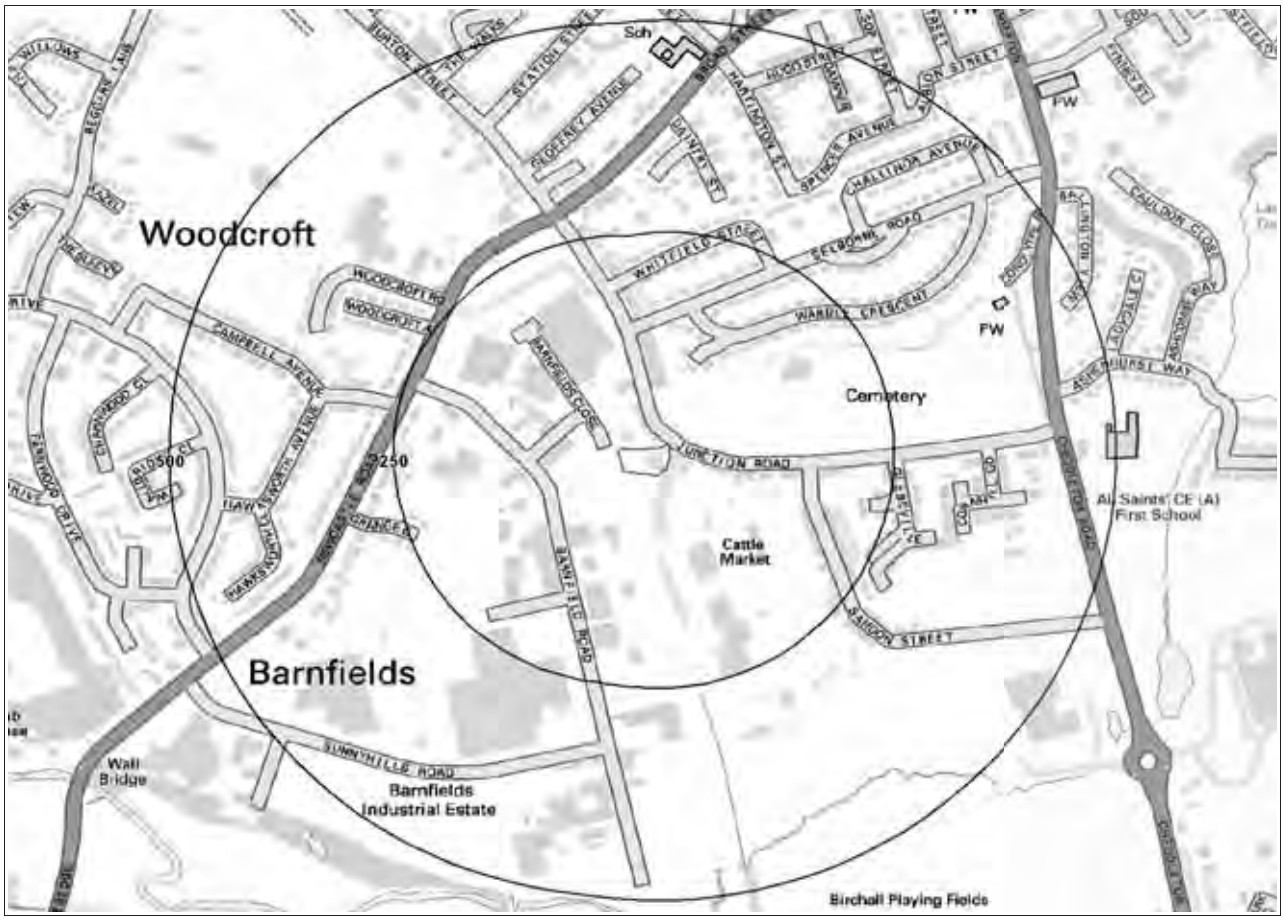
6c. Hydrogeology – Source Protection Zones and Potable Water Abstraction Licenses



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6d. Hydrogeology – Source Protection Zones within confined aquifer



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Site Outline

250 Search Buffers (m)
500

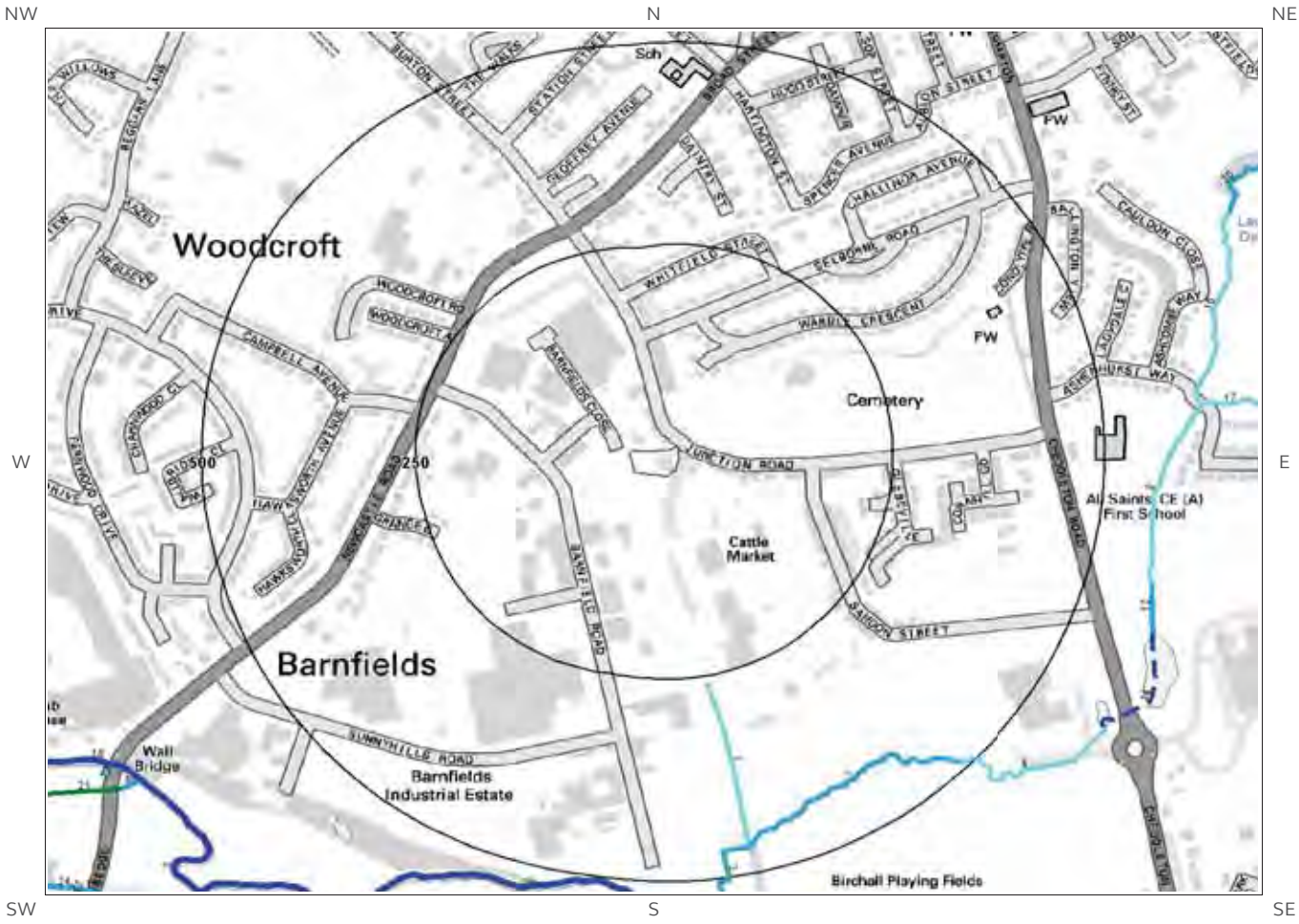
Source Protection Zone 1 - Inner Catchment

Source Protection Zone 2C - Outer Catchment within Confined Aquifer

Source Protection Zone 3C - Total Catchment within Confined Aquifer

Potable Water Abstraction Licence

6e. Hydrology – Detailed River Network and River Quality



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Site Outline

250 — Search Buffers (m)
500 —

Primary River
Secondary River
Tertiary River
Lake/Reservoir
Underground River (inferred)
General Quality Assessment: Biology
General Quality Assessment: Chemistry

Canal
Canal Tunnel
Culvert
Multiple Channel Culvert
Underground River (Potential Sewer)
Underground River (local knowledge)

6.Hydrogeology and Hydrology

6.1 Aquifer within Superficial Deposits

Are there records of strata classification within the superficial geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Superficial Geology Map (6a):

ID	Distance (m)	Direction	Designation	Description
1	77	S	Secondary A	Permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers

6.2 Aquifer within Bedrock Deposits

Are there records of strata classification within the bedrock geology at or in proximity to the property? Yes

From 1 April 2010, the Environment Agency/Natural Resources Wales's Groundwater Protection Policy has been using aquifer designations consistent with the Water Framework Directive. For further details on the designation and interpretation of this information, please refer to the Groundsure Enviro Insight User Guide.

The following aquifer records are shown on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	Designation	Description
1	0	On Site	Principal	Geology of high intergranular and/or fracture permeability, usually providing a high level of water storage and may support water supply/river base flow on a strategic scale. Generally principal aquifers were previously major aquifers

6.3 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 2000m of the study site? Yes

The following Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
Not shown	1299	N	398100 357000	Status: Historical Licence No: 03/28/30/0158 Details: General Farming & Domestic Direct Source: Groundwater Midlands Region Point: Maple House - Well Data Type: Point Name: AVON HOLDINGS (WOLVERHAMPTON) LIMITED	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 17/11/1966 Expiry Date: - Issue No: 100 Version Start Date: 16/11/1972 Version End Date:
Not shown	1413	NE	398800 356910	Status: Historical Licence No: 03/28/30/0019 Details: Process water Direct Source: Groundwater Midlands Region Point: Ball Haye Road, Leek - Borehole Data Type: Point Name: BRITISH TRIMMINGS (LEEK) LTD	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 12/11/1965 Expiry Date: - Issue No: 100 Version Start Date: 9/8/1996 Version End Date:
Not shown	1418	N	397560 357040	Status: Historical Licence No: 03/28/30/0214 Details: Non-Evaporative Cooling Direct Source: Groundwater Midlands Region Point: Macclesfield Road, Leek - Borehole Data Type: Point Name: The Portland Dyeing Company Ltd	Annual Volume (m^3): 147972 Max Daily Volume (m^3): 5454 Original Application No: - Original Start Date: 9/6/1998 Expiry Date: - Issue No: 104 Version Start Date: 30/1/2009 Version End Date:
Not shown	1418	N	397560 357040	Status: Historical Licence No: 03/28/30/0214 Details: Process Water Direct Source: Groundwater Midlands Region Point: Macclesfield Road, Leek - Borehole Data Type: Point Name: The Portland Dyeing Company Ltd	Annual Volume (m^3): 147972 Max Daily Volume (m^3): 5454 Original Application No: - Original Start Date: 9/6/1998 Expiry Date: - Issue No: 104 Version Start Date: 30/1/2009 Version End Date:
Not shown	1460	S	397540 354290	Status: Active Licence No: 03/28/30/0195 Details: Potable Water Supply - Direct Direct Source: Groundwater Midlands Region Point: Wall Grange - Borehole 1 Data Type: Point Name: SEVERN TRENT WATER LIMITED	Annual Volume (m^3): 4970000 Max Daily Volume (m^3): 20000 Original Application No: NPS/WR/005189 Original Start Date: 8/2/1988 Expiry Date: - Issue No: 102 Version Start Date: 22/10/2010 Version End Date:
Not shown	1705	S	397550 354030	Status: Active Licence No: 03/28/30/0195 Details: Potable Water Supply - Direct Direct Source: Groundwater Midlands Region Point: Wall Grange - Borehole 2 Data Type: Point Name: SEVERN TRENT WATER LIMITED	Annual Volume (m^3): 4970000 Max Daily Volume (m^3): 20000 Original Application No: NPS/WR/005189 Original Start Date: 8/2/1988 Expiry Date: - Issue No: 102 Version Start Date: 22/10/2010 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1770	S	398200 353900	Status: Historical Licence No: 03/28/30/0068 Details: Process water Direct Source: Groundwater Midlands Region Point: Leekbrook Works - Borehole 2 Data Type: Point Name: JOSHUA WARDLE LIMITED	Annual Volume (m^3): 909200 Max Daily Volume (m^3): 9092 Original Application No: - Original Start Date: 17/11/1965 Expiry Date: - Issue No: 100 Version Start Date: 7/6/1994 Version End Date:
Not shown	1830	N	397700 357500	Status: Historical Licence No: 03/28/30/0054 Details: General Farming & Domestic Direct Source: Groundwater Midlands Region Point: Home Farm - Collecting Chamber Data Type: Point Name: MYCOCK	Annual Volume (m^3): - Max Daily Volume (m^3): - Original Application No: - Original Start Date: 18/11/1965 Expiry Date: - Issue No: 100 Version Start Date: 18/11/1965 Version End Date:
Not shown	1971	N	397970 357670	Status: Active Licence No: 03/28/30/0184 Details: Potable Water Supply - Direct Direct Source: Groundwater Midlands Region Point: Abbey Green Pumping Station - Borehole Data Type: Point Name: SEVERN TRENT WATER LIMITED	Annual Volume (m^3): 3650000 Max Daily Volume (m^3): 10000 Original Application No: NPS/WR/005188 Original Start Date: 6/7/1978 Expiry Date: - Issue No: 102 Version Start Date: 22/10/2010 Version End Date:
Not shown	1979	S	398300 353700	Status: Historical Licence No: 03/28/30/0068 Details: Process water Direct Source: Groundwater Midlands Region Point: Leekbrook Works - Borehole 1 Data Type: Point Name: JOSHUA WARDLE LIMITED	Annual Volume (m^3): 909200 Max Daily Volume (m^3): 9092 Original Application No: - Original Start Date: 17/11/1965 Expiry Date: - Issue No: 100 Version Start Date: 7/6/1994 Version End Date:

6.4 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 2000m of the study site? Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer within Bedrock Geology Map (6b):

ID	Distance (m)	Direction	NGR	Details	
14	724	SW	397390 355310	Status: Historical Licence No: 03/28/30/0218 Details: Spray Irrigation - Direct Direct Source: Surface Water Midlands Region Point: Westwood Golf Club (river Churnet) Data Type: Point Name: WESTWOOD GOLF CLUB	Annual Volume (m^3): 27392 Max Daily Volume (m^3): 128 Application No: A/28/30/43 Original Start Date: 11/10/2005 Expiry Date: 31/3/2018 Issue No: 1 Version Start Date: 11/10/2005 Version End Date:
Not shown	1243	N	397700 356900	Status: Active Licence No: 03/28/30/0173 Details: Milling & Water Power Other Than Electricity Generation Direct Source: Surface Water Midlands Region Point: River Churnet Data Type: Point Name: THE BRINDLEY MILL PRESERVATION TRUST	Annual Volume (m^3): 272760 Max Daily Volume (m^3): 272760 Application No: - Original Start Date: 23/2/1974 Expiry Date: - Issue No: 100 Version Start Date: 23/2/1974 Version End Date:

ID	Distance (m)	Direction	NGR	Details	
Not shown	1418	N	397590 357050	Status: Historical Licence No: 03/28/30/0208 Details: Process Water Direct Source: Surface Water Midlands Region Point: Churnet Works - River Churnet Data Type: Point Name: The Portland Dyeing Company Ltd	Annual Volume (m³): 800000 Max Daily Volume (m³): 8800 Application No: - Original Start Date: 19/9/1995 Expiry Date: - Issue No: 107 Version Start Date: 30/1/2009 Version End Date:
Not shown	1418	N	397590 357050	Status: Historical Licence No: 03/28/30/0208 Details: Non-Evaporative Cooling Direct Source: Surface Water Midlands Region Point: Churnet Works - River Churnet Data Type: Point Name: The Portland Dyeing Company Ltd	Annual Volume (m³): 800000 Max Daily Volume (m³): 8800 Application No: - Original Start Date: 19/9/1995 Expiry Date: - Issue No: 107 Version Start Date: 30/1/2009 Version End Date:
Not shown	1418	N	397590 357050	Status: Historical Licence No: 03/28/30/0208 Details: General Use Relating To Secondary Category (Medium Loss) Direct Source: Surface Water Midlands Region Point: Churnet Works - River Churnet Data Type: Point Name: CHURNET WORKS ESTATES LIMITED	Annual Volume (m³): 1200000 Max Daily Volume (m³): 4400 Application No: - Original Start Date: 19/9/1995 Expiry Date: - Issue No: 105 Version Start Date: 16/10/2007 Version End Date:
Not shown	1533	N	397438 357117	Status: Active Licence No: 03/28/30/0208 Details: Process Water Direct Source: Surface Water Midlands Region Point: River Churnet At Churnet Works Data Type: Point Name: The Portland Dyeing Company Ltd	Annual Volume (m³): 400000 Max Daily Volume (m³): 4400 Application No: NPS/WR/013697 Original Start Date: 19/9/1995 Expiry Date: 31/3/2030 Issue No: 109 Version Start Date: 28/6/2013 Version End Date:
Not shown	1546	NW	397410 357120	Status: Active Licence No: 03/28/30/0129 Details: Process Water Direct Source: Surface Water Midlands Region Point: Bridge End,leek - River Churnet Data Type: Point Name: Tennants Fine Chemicals Ltd	Annual Volume (m³): 425800 Max Daily Volume (m³): 2513 Application No: NPS/WR/006904 Original Start Date: 8/2/1966 Expiry Date: - Issue No: 104 Version Start Date: 25/3/2011 Version End Date:
Not shown	1546	NW	397410 357120	Status: Active Licence No: 03/28/30/0129 Details: Evaporative Cooling Direct Source: Surface Water Midlands Region Point: Bridge End,leek - River Churnet Data Type: Point Name: Tennants Fine Chemicals Ltd	Annual Volume (m³): 425800 Max Daily Volume (m³): 2513 Application No: NPS/WR/006904 Original Start Date: 8/2/1966 Expiry Date: - Issue No: 104 Version Start Date: 25/3/2011 Version End Date:
Not shown	1870	S	398200 353800	Status: Historical Licence No: 03/28/30/0017 Details: Non-Evaporative Cooling Direct Source: Surface Water Midlands Region Point: Leekbrook Works, Staffs - River Churnet Data Type: Point Name: JOSHUA WARDLE LIMITED	Annual Volume (m³): 254576 Max Daily Volume (m³): 1091.04 Application No: - Original Start Date: 9/11/1965 Expiry Date: - Issue No: 100 Version Start Date: 7/6/1994 Version End Date:

6.5 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site? Yes

The following Potable Water Abstraction Licences records are represented as points, lines and regions on the SPZ and Potable Water Abstraction Licences Map (6c):

ID	Distance (m)	Direction	NGR	Details	
Not shown	1460	S	397540 354290	Status: Active Licence No: 03/28/30/0195 Details: Potable Water Supply - Direct Direct Source: Groundwater Midlands Region Point: Wall Grange - Borehole 1 Data Type: Point Name: SEVERN TRENT WATER LIMITED	Annual Volume (m^3): 4970000 Max Daily Volume (m^3): 20000 Original Application No: NPS/WR/005189 Original Start Date: 8/2/1988 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
Not shown	1705	S	397550 354030	Status: Active Licence No: 03/28/30/0195 Details: Potable Water Supply - Direct Direct Source: Groundwater Midlands Region Point: Wall Grange - Borehole 2 Data Type: Point Name: SEVERN TRENT WATER LIMITED	Annual Volume (m^3): 4970000 Max Daily Volume (m^3): 20000 Original Application No: NPS/WR/005189 Original Start Date: 8/2/1988 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:
Not shown	1971	N	397970 357670	Status: Active Licence No: 03/28/30/0184 Details: Potable Water Supply - Direct Direct Source: Groundwater Midlands Region Point: Abbey Green Pumping Station - Borehole Data Type: Point Name: SEVERN TRENT WATER LIMITED	Annual Volume (m^3): 3650000 Max Daily Volume (m^3): 10000 Original Application No: NPS/WR/005188 Original Start Date: 6/7/1978 Expiry Date: - Issue No: 102 Version Start Date: Version End Date:

6.6 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site? Yes

The following Source Protection Zones records are represented on the SPZ and Potable Water Abstraction Map (6c):

ID	Distance (m)	Direction	Zone	Description
1	0	On Site	3	Total catchment

6.7 Source Protection Zones within Confined Aquifer

Are there any Source Protection Zones within the Confined Aquifer within 500m of the study site? No

Historically, Source Protection Zone maps have been focused on regulation of activities which occur at or near the ground surface, such as prevention of point source pollution and bacterial contamination of water supplies. Sources in confined aquifers were often considered to be protected from these surface pressures due to the presence of a low permeability confining layer (e.g. glacial till, clay). The increased interest in subsurface activities such as onshore oil and gas exploration, ground source heating and cooling requires protection zones for confined sources to be marked on SPZ maps where this has not already been done.

Database searched and no data found.

6.8 Groundwater Vulnerability and Soil Leaching Potential

Is there any Environment Agency/Natural Resources Wales information on groundwater vulnerability and soil leaching potential within 500m of the study site? Yes

Distance (m)	Direction	Classification	Soil Vulnerability Category	Description
0	On Site	Major Aquifer/High Leaching Potential	HU	Soil information for urban areas and restored mineral workings. These soils are therefore assumed to be highly permeable in the absence of site-specific information.
305	S	Major Aquifer/High Leaching Potential	H1	Soils which readily transmit liquid discharges because they are shallow or susceptible to rapid flow directly to rock, gravel or groundwater.
421	E	Major Aquifer/Low Leaching Potential	L	Soils in which pollutants are unlikely to penetrate the soil layer because either water movement is largely horizontal, or they have the ability to attenuate diffuse pollutants.

6.9 River Quality

Is there any Environment Agency/Natural Resources Wales information on river quality within 1500m of the study site? Yes

6.9.1 Biological Quality:

Database searched and no data found.

6.9.2 Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAHI). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

The following Chemical Quality records are shown on the Hydrology Map (6e):

					Chemical Quality Grade				
ID	Distance (m)	Direction	NGR	River Quality Grade	2005	2006	2007	2008	2009
31A	720	SW	397400 355300	River Name: Churnet R Reach: Bridgend To Leek Stw Outfall End/Start of Stretch: Sample Point NGR	B	B	B	A	B

6.10 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site? Yes

The following Detailed River Network records are represented on the Hydrology Map (6e):

ID	Distance (m)	Direction	Details	
1	258	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined
2	426	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
3	466	S	River Name: - Welsh River Name: - Alternative Name: -	River Type: Secondary River Main River Status: Currently Undefined
4	488	SE	River Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Main River Status: Currently Undefined

6.11 Surface Water Features

Are there any surface water features within 250m of the study site? No

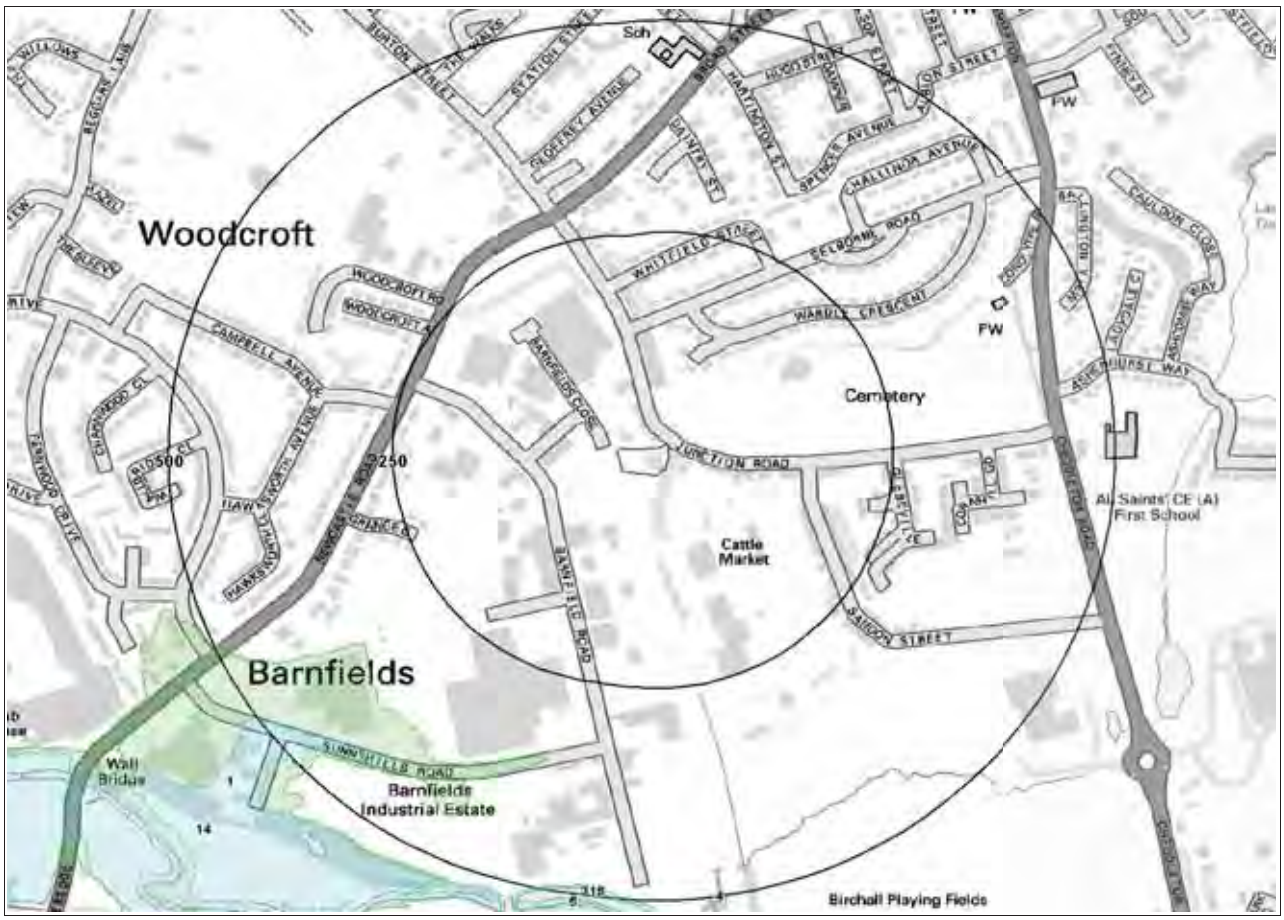
Database searched and no data found.

7a. Environment Agency/Natural Resources Wales Flood Map for Planning (from rivers and the sea)

NW N NE

W E

SW S SE



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Site Outline

100 / 250 Search Buffers (m)

Zone 2 Floodplain

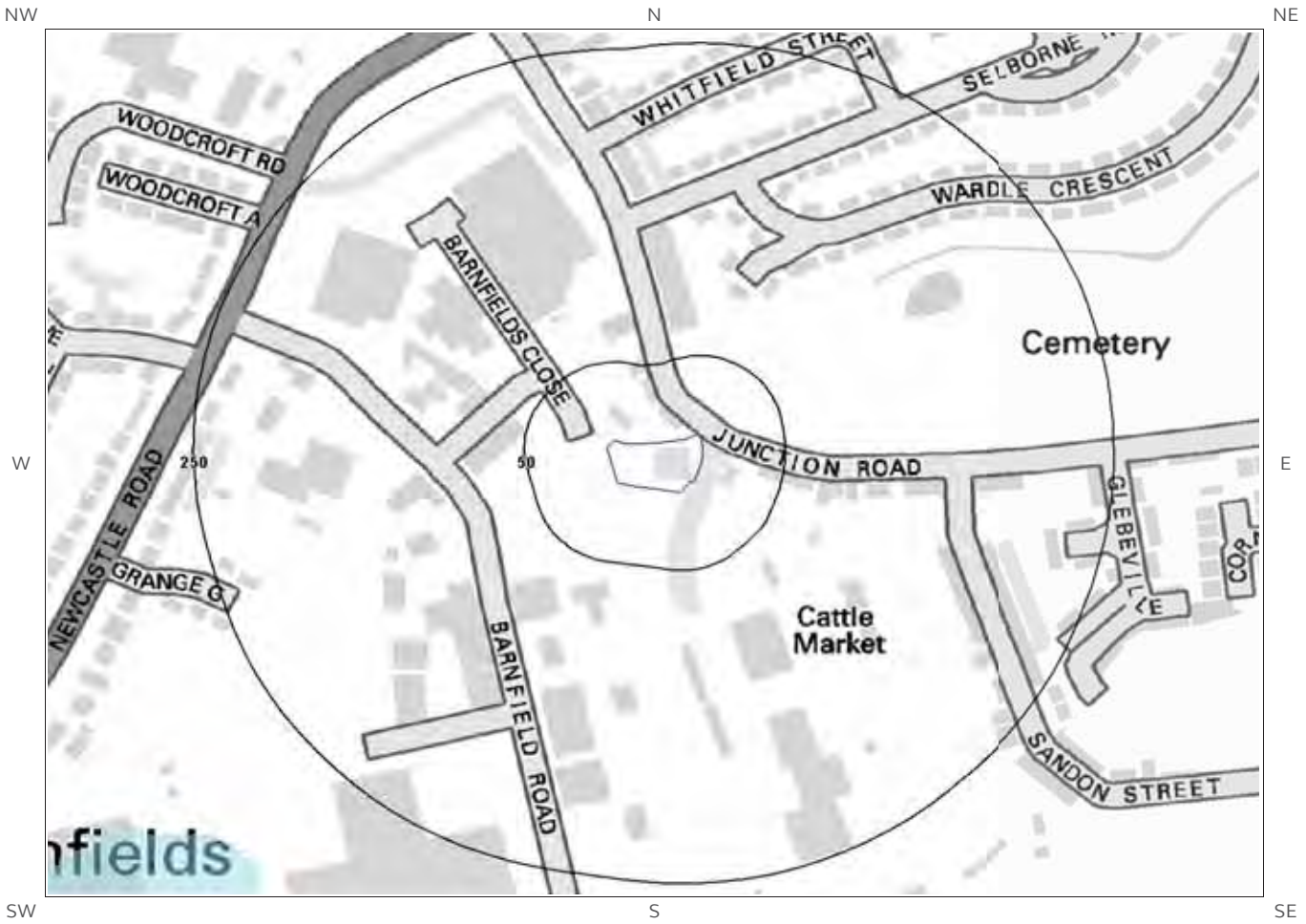
Zone 3 Floodplain

Flood Defences

Area used for Flood Storage

Area Benefiting from Flood Defences

7b. Environment Agency/Natural Resources Wales Risk of Flooding from Rivers and the Sea (RoFRaS) Map



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Site Outline

100 250 Search Buffers (m)

RoFRaS Rating

- Very Low
- Low
- Medium
- High

7 Flooding

7.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency/Natural Resources Wales Zone 2 floodplain? No

Environment Agency/Natural Resources Wales Zone 2 floodplains estimate the annual probability of flooding as between 1 in 1000 (0.1%) and 1 in 100 (1%) from rivers and between 1 in 1000 (0.1%) and 1 in 200 (0.5%) from the sea. Any relevant data is represented on Map 7a – Flood Map for Planning:

Database searched and no data found.

7.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency/Natural Resources Wales Zone 3 floodplain? No

Zone 3 shows the extent of a river flood with a 1 in 100 (1%) or greater chance of occurring in any year or a sea flood with a 1 in 200 (0.5%) or greater chance of occurring in any year. Any relevant data is represented on Map 7a – Flood Map for Planning.

Database searched and no data found.

7.3 Risk of Flooding from Rivers and the Sea (RoFRaS) Flood Rating

What is the highest risk of flooding onsite? Very Low

The Environment Agency/Natural Resources Wales RoFRaS database provides an indication of river and coastal flood risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach by considering their location, type, condition and standard of protection.

RoFRaS data for the study site indicates the property is in an area with a Very Low (less than 1 in 1000) chance of flooding in any given year.

7.4 Flood Defences

Are there any Flood Defences within 250m of the study site? No

Database searched and no data found.

7.5 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? No

7.6 Areas benefiting from Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? No

7.7 Groundwater Flooding Susceptibility Areas

7.7.1 Are there any British Geological Survey groundwater flooding susceptibility areas within 50m of the boundary of the study site? Yes

Does this relate to Clearwater Flooding or Superficial Deposits Flooding? Clearwater Flooding

Notes: Groundwater flooding may either be associated with shallow unconsolidated sedimentary aquifers which overlie unproductive aquifers (Superficial Deposits Flooding), or with unconfined aquifers (Clearwater Flooding).

7.7.2 What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

Potential at Surface

Where potential for groundwater flooding to occur at surface is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

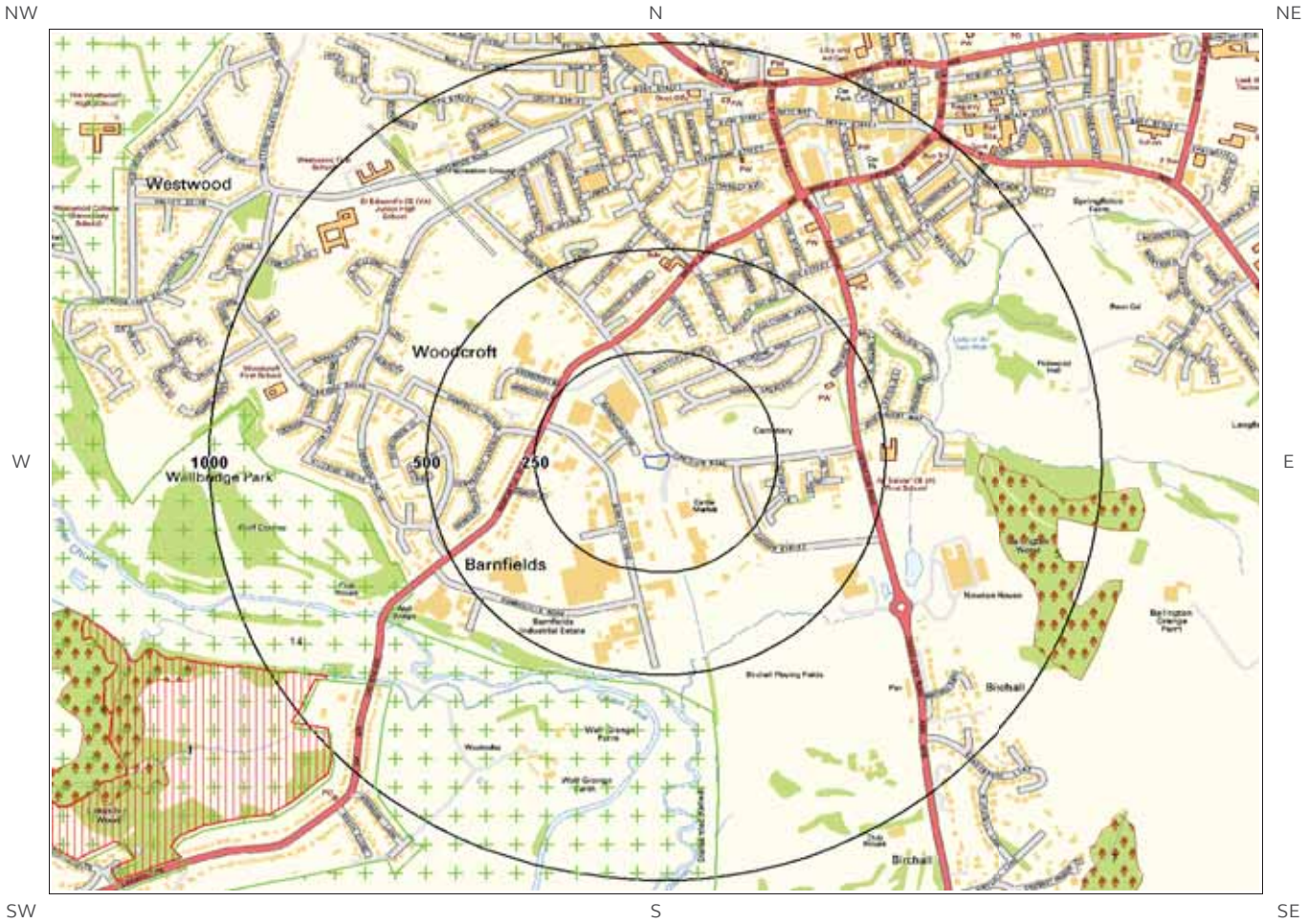
7.8 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result? Low

Notes: Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The confidence rating is on a threefold scale - Low, Moderate and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

8. Designated Environmentally Sensitive Sites Map



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Site Outline

100 / 250 Search Buffers (m)

- AONB
- National Park
- SSSI
- Special Protection Areas
- Nitrate Vulnerable Zones
- Green Belt
- Environmentally Sensitive Areas
- Special Areas of Conservation
- World Heritage Sites
- Nitrate Sensitive Areas
- Ancient Woodland
- National Nature Reserve
- Local Nature Reserves
- Ramsar Sites

8. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 2000m of the study site?	Yes

8.1 Records of Sites of Special Scientific Interest (SSSI) within 2000m of the study site:

0

Database searched and no data found.

8.2 Records of National Nature Reserves (NNR) within 2000m of the study site:

0

Database searched and no data found.

8.3 Records of Special Areas of Conservation (SAC) within 2000m of the study site:

0

Database searched and no data found.

8.4 Records of Special Protection Areas (SPA) within 2000m of the study site:

0

Database searched and no data found.

8.5 Records of Ramsar sites within 2000m of the study site:

0

Database searched and no data found.

8.6 Records of Ancient Woodland within 2000m of the study site:

9

The following records of Designated Ancient Woodland provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	Ancient Woodland Name	Data Source
5	712	E	UNKNOWN	Ancient and Semi-Natural Woodland
6	1149	SW	UNKNOWN	Ancient and Semi-Natural Woodland
7	1338	SE	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1418	S	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1508	W	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1538	W	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1815	SW	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1938	W	UNKNOWN	Ancient and Semi-Natural Woodland
Not shown	1986	W	UNKNOWN	Ancient Replanted Woodland

8.7 Records of Local Nature Reserves (LNR) within 2000m of the study site:

2

The following Local Nature Reserve (LNR) records provided by Natural England/Natural Resources Wales are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	LNR Name	Data Source
1	893	SW	Ladderedge Country Park	Natural England
Not shown	1485	N	Brough Park Fields	Natural England

8.8 Records of World Heritage Sites within 2000m of the study site:

0

Database searched and no data found.

8.9 Records of Environmentally Sensitive Areas within 2000m of the study site:

2

The following Environmentally Sensitive Area records produced by DEFRA are represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance (m)	Direction	ESA Name	Data Source
Not shown	1717	SE	South West Peak	Natural England
Not shown	1935	E	South West Peak	Natural England

8.10 Records of Areas of Outstanding Natural Beauty (AONB) within 2000m of the study site:

0

Database searched and no data found.

8.11 Records of National Parks (NP) within 2000m of the study site:

0

Database searched and no data found.

8.12 Records of Nitrate Sensitive Areas within 2000m of the study site:

0

Database searched and no data found.

8.13 Records of Nitrate Vulnerable Zones within 2000m of the study site:

0

Database searched and no data found.

8.14 Records of Green Belt land within 2000m of the study site:

1

Green Belt data contains Ordnance Survey data © Crown copyright and database right [2015].

ID	Distance	Direction	Green Belt Name	Local Authority Name

14	523	S	Stoke Greenbelt	Staffordshire Moorlands District

9. Natural Hazards Findings

9.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a Groundsure Geo Insight, available from our website. The following information has been found:

9.1.1 Shrink Swell

What is the maximum Shrink-Swell*[*] hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Ground conditions predominantly non-plastic. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely likely due to potential problems with shrink-swell clays.

9.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.

9.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Soluble rocks are present, but unlikely to cause problems except under exceptional conditions. No special actions required to avoid problems due to soluble rocks. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with soluble rocks.

* This indicates an automatically generated 50m buffer and site.

9.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

9.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
Deposits with potential to collapse when loaded and saturated are unlikely to be present. No special ground investigation required or increased construction costs or increased financial risk due to potential problems with collapsible deposits.

9.1.6 Running Sand

What is the maximum Running Sand*[*] hazard rating identified on the study site? Negligible

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard
No indicators for running sand identified. No special actions required to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.

9.2 Radon

9.2.1 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level? The property is in a Radon Affected Area, as between 1 and 3% of properties are above the Action Level.

* This indicates an automatically generated 50m buffer and site.

9.2.2 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing
ones as described in publication BR211 by the Building Research Establishment? No radon protective measures are necessary.

10. Mining

10.1 Coal Mining

Are there any coal mining areas within 75m of the study site? No

Database searched and no data found.

10.2 Non-Coal Mining

Are there any Non-Coal Mining areas within 50m of the study site boundary? No

Database searched and no data found.

10.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site? No
Guidance: No Guidance Required.

Contact Details

Groundsure Helpline
Telephone: 08444 159 000
info@groundsure.com

British Geological Survey Enquiries
Kingsley Dunham Centre
Keyworth, Nottingham NG12 5GG
Tel: 0115 936 3143.
Fax: 0115 936 3276.
Email:
Web:**www.bgs.ac.uk**
BGS Geological Hazards Reports and general geological enquiries:
enquiries@bgs.ac.uk

Environment Agency
National Customer Contact Centre, PO Box 544
Rotherham, S60 1BY
Tel: 03708 506 506
Web: **www.environment-agency.gov.uk**
Email: enquiries@environment-agency.gov.uk

Public Health England
Public information access office
Public Health England, Wellington House
133-155 Waterloo Road, London, SE1 8UG
www.gov.uk/phe
Email:**enquiries@phe.gov.uk**
Main switchboard**: 020 7654 8000**

The Coal Authority
200 Lichfield Lane
Mansfield
Notts NG18 4RG
Tel: 0345 7626 848
DX 716176 Mansfield 5
www.coal.gov.uk

Ordnance Survey
Adanac Drive, Southampton
SO16 0AS
Tel: 08456 050505

Local Authority
Authority: Staffordshire Moorlands District Council
Phone: 0845 605 3010
Web: http://www.staffsmoorlands.gov.uk/
Address: Moorlands House, Stockwell Street, Leek, Staffordshire,

Gemapping PLC
Virginia Villas, High Street, Hartley Witney,
Hampshire RG27 8NW
Tel: 01252 845444

Acknowledgements: Site of Special Scientific Interest, National Nature Reserve, Ramsar Site, Special Protection Area, Special Area of Conservation data is provided by, and used with the permission of, Natural England who retain the Copyright and Intellectual Property Rights for the data.
PointX © Database Right/Copyright, Thomson Directories Limited © Copyright Link Interchange Network Limited © Database Right/Copyright and Ordnance Survey © Crown Copyright and/or Database Right. All Rights Reserved. Licence Number [03421028].
This report has been prepared in accordance with the Groundsure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

Groundsure's Terms and Conditions can be viewed online at this link:
https://www.groundsure.com/terms-and-conditions-sept-2016

APPENDIX C
BOREHOLE and
IN SITU TEST RESULTS

SLADEN ASSOCIATES

Unit 5, Netherton Workshops, Highley, Bridgnorth, Shropshire, WV16 6NN Tel:01746 860222 Fax:01746 862330

Borehole No: 1

Equipment & Methods	Job No: 17-1844			
Mini Rig/Window Sampler	Project: Former Moorlands Public House, Leek			
Carried out for	Ground Level	Coordinates		Date
Moss Builders Ltd	0	E N		30-10-17

Descriptions	Legend	Depth	Reduced Level	Samples/Tests/Notes Depth	Sample Type	Sample No.	Test	Field Records	Well
Grass underlain by: soft dark brown sandy CLAY with occasional rounded to angular fine to coarse gravel and many roots. Gravel is quartz and brick. (MADE GROUND)				0.00 to 1.00	U	1	PID	<0.1ppm	
				0.10 to 2.30	CPT	2	DPSH Test	see separate record	
		0.30	-0.30						
Medium dense black slightly sandy angular fine to medium GRAVEL. Gravel is ash. (MADE GROUND)		0.40	-0.40						
Medium dense red brown sandy angular fine to coarse GRAVEL. Gravel is ash. (MADE GROUND)		0.65	-0.65						
Red SANDSTONE cobble. (MADE GROUND)		0.70	-0.70						
Loose to medium dense dark brown, locally black SAND with some angular fine to coarse gravel. Gravel is ash, brick and sandstone. (MADE GROUND)				1.00 to 2.00	U	3	PID	<0.1ppm	
		1.10	-1.10						
Loose dark brown, locally brown silty fine to medium SAND. (CHESTER PEBBLE BEDS FORMATION)									
		1.40	-1.40						
Loose orange brown silty fine to medium SAND with occasional rounded to sub rounded fine to coarse gravel. Gravel is quartz. (CHESTER PEBBLE BEDS FORMATION)									
		1.85	-1.85						
Medium dense red silty fine to medium SAND with occasional sandstone lithorelicts. (CHESTER PEBBLE BEDS FORMATION)				2.00 to 2.15	SPT	4	N=>50	14,30 blows for 75mm	
		2.15	-2.15						
End of Borehole									

Additional Comments
Log based on limited returns due to sampling method - depths are approximate.
Continuous dynamic probe put down prior borehole - see separate record.
Groundwater: none encountered.
50mm groundwater/gas monitoring standpipe installed 0.0m to 0.5m, plain pipe with bentonite seal 0.5m to 1.97m slotted pipe with gravel surround.

Logged by GLD

Figure

SLADEN ASSOCIATES

Unit 5, Netherton Workshops, Highley, Bridgnorth, Shropshire, WV16 6NN Tel:01746 860222 Fax:01746 862330

Borehole No: 2

Equipment & Methods	Job No: 17-1844			
Mini Rig/Window Sampler	Project: Former Moorlands Public House, Leek			
Carried out for	Ground Level	Coordinates		Date
Moss Builders Ltd	0	E N		30-10-17

Descriptions	Legend	Depth	Reduced Level	Samples/Tests/Notes Depth	Sample Type	Sample No.	Test	Field Records
Asphalt. (MADE GROUND)		0.07	-0.07	0.00 to 1.00	U	1	PID	<0.1ppm
Medium dense red brown, grey and black SAND with much angular fine to coarse gravel. Gravel is ash. (MADE GROUND)		0.35	-0.35					
Medium dense becoming dense black SAND with much angular fine to coarse gravel. Gravel is ash. (MADE GROUND)		0.65	-0.65	0.40 to 1.80	CPT	2	DPSH Test	see separate record
Medium dense dark brown SAND with occasional carbonaceous fragments. (OLD TOPSOIL)		0.70	-0.70					
Medium dense orange brown becoming red silty fine to medium SAND with occasional rounded to sub rounded fine to medium gravel. Gravel is quartz. (CHESTER PEBBLE BEDS FORMATION)				1.00 to 1.30	SPT	3	N=>50	5,8,15,38 blows for 75mm
End of Borehole		1.30	-1.30					

Additional Comments
Log based on limited returns due to sampling method - depths are approximate.
Continuous dynamic probe put down prior borehole - see separate record.
Groundwater: none encountered.

Logged by GLD

Figure

SLADEN ASSOCIATES

Unit 5, Netherton Workshops, Highley, Bridgnorth, Shropshire, WV16 6NN Tel:01746 860222 Fax:01746 862330

Borehole No: 3

Equipment & Methods	Job No: 17-1844			
Mini Rig/Window Sampler	Project: Former Moorlands Public House, Leek			
Carried out for	Ground Level	Coordinates		Date
Moss Builders Ltd	0	E N		30-10-17

Descriptions	Legend	Depth	Reduced Level	Samples/Tests/Notes Depth	Sample Type	Sample No.	Test	Field Records	Well
Asphalt. (MADE GROUND)		0.07	-0.07	0.07 to 0.50	B	1	PID	<0.1ppm	
Medium dense red brown SAND with much angular fine coarse gravel. Gravel is ash. (MADE GROUND)				0.40 to 1.70	CPT	2	DPSH Test	see separate record	
		0.50	-0.50	0.50 to 1.00	B	3	PID	<0.1ppm	
Dense becoming medium dense black and dark grey SAND with much angular fine coarse gravel and occasional cobbles. Gravel is ash and occasional brick. (MADE GROUND)									
		1.00	-1.00	1.00 to 1.37	SPT	4	N=>50	4,4,8,14,20 blows fo 75mm	
Medium dense becoming very dense red brown silty fine to medium SAND. (CHESTER PEBBLE BEDS FORMATION)									
		1.37	-1.37						
End of Borehole									

Additional Comments
Log based on limited returns due to sampling method - depths are approximate.
Continuous dynamic probe put down prior borehole - see separate record.
Groundwater: none encountered.
50mm groundwater/gas monitoring standpipe installed 0.0m to 0.5m, plain pipe with bentonite seal 0.5m to 0.97m slotted pipe with gravel surround.

Logged by GLD

Figure

SLADEN ASSOCIATES

Unit 5, Netherton Workshops, Highley, Bridgnorth, Shropshire, WV16 6NN Tel:01746 860222 Fax:01746 862330

Borehole No: 4

Equipment & Methods	Job No: 17-1844			
Mini Rig/Window Sampler	Project: Former Moorlands Public House, Leek			
Carried out for	Ground Level	Coordinates		Date
Moss Builders Ltd	0	E N		30-10-17

Descriptions	Legend	Depth	Reduced Level	Samples/Tests/Notes Depth	Sample Type	Sample No.	Test	Field Records
Asphalt. (MADE GROUND)		0.07	-0.07	0.00 to 1.00	U	1	PID	<0.1ppm
Medium dense red brown SAND with much angular fine to coarse gravel. Gravel is ash. (MADE GROUND)		0.35	-0.35	0.30 to 0.70	CPT	2	DPSH Test	see separate record
Medium dense becoming very dense red silty fine to medium SAND. (CHESTER PEBBLE BEDS FORMATION)		0.60	-0.60	0.60	SPT	3	N=>50	25 blows for 75mm
End of Borehole								

Additional Comments
Log based on limited returns due to sampling method - depths are approximate.
Continuous dynamic probe put down prior borehole - see separate record.
Groundwater: none encountered.
No recovery SPT 0.6 - 0.675m.

Logged by GLD

Figure

SLADEN ASSOCIATES

Unit 5, Netherton Workshops, Highley, Bridgnorth, Shropshire, WV16 6NN Tel:01746 860222 Fax:01746 862330

Borehole No: 5

Equipment & Methods	Job No: 17-1844			
Mini Rig/Window Sampler	Project: Former Moorlands Public House, Leek			
Carried out for	Ground Level	Coordinates		Date
Moss Builders Ltd	0	E N		26-10-17

Descriptions	Legend	Depth	Reduced Level	Samples/Tests/Notes Depth	Sample Type	Sample No.	Test	Field Records	Well
Concrete paving on sand. (MADE GROUND)		0.05	-0.05	0.00 to 1.00	U	1	PID	<0.1ppm	
Loose to medium dense brown and dark brown SAND with some rounded to angular fine to medium gravel. Gravel is concrete, brick, quartz and ash. (MADE GROUND)		0.35	-0.35						
Loose to medium dense black, locally brown SAND with much angular fine to medium gravel. Gravel is ash and glass. (MADE GROUND)		0.60	-0.60	0.40 to 1.20	CPT	2	DPSH Test	see separate record	
Loose to medium dense black, locally brown slightly clayey SAND with occasional angular to sub angular fine to medium gravel. Gravel is ash. (MADE GROUND)		0.75	-0.75						
Loose to medium dense silty fine to medium SAND with some carbonaceous fragments. (MADE GROUND)		0.85	-0.85	1.00 to 1.07	SPT	3	N=>50	25 blows for 75mm	
Loose to medium dense red brown, locally brown silty fine to medium SAND with occasional carbonaceous fragments and sub rounded fine to medium gravel. Gravel is sandstone. (DISTURBED CHESTER PEBBLE BEDS FORMATION)		1.07	-1.07						
End of Borehole									

Additional Comments
Log based on limited returns due to sampling method - depths are approximate.
Continuous dynamic probe put down prior borehole - see separate record.
Groundwater: none encountered. No recovery SPT 1.0 - 1.075m.
50mm groundwater/gas monitoring standpipe installed 0.0m to 0.5m, plain pipe with bentonite seal 0.5m to 1.05m slotted pipe with gravel surround.

Logged by GLD

Figure

SLADEN ASSOCIATES

Unit 5, Netherton Workshops, Highley, Bridgnorth, Shropshire, WV16 6NN Tel:01746 860222 Fax:01746 862330

Borehole No: 6

Equipment & Methods	Job No: 17-1844		
Mini Rig/Window Sampler	Project: Former Moorlands Public House, Leek		
Carried out for	Ground Level	Coordinates	Date
Moss Builders Ltd	0	E N	30-10-17

Descriptions	Legend	Depth	Reduced Level	Samples/Tests/Notes: Depth	Sample Type	Sample No.	Test	Field Records
Concrete paving underline by: loose to medium dense red brown fine to medium SAND with occasional rounded fine to medium gravel. Gravel is quartz. (MADE GROUND)				0.00 to 1.00	U	1	PID	<0.1ppm
		0.40	-0.40	0.40 to 1.20	CPT	2	DPSH Test	see separate record
Loose to medium dense red brown SAND with much angular fine to coarse gravel. Gravel is ash. (MADE GROUND)								
		0.70	-0.70					
Loose to medium dense dark brown, red and red brown SAND with occasional, locally much angular to rounded fine to medium gravel and occasional cobbles. Gravel is ash, quartz and brick. (MADE GROUND)								
		1.00	-1.00	1.00 to 1.03	SPT	3	N=>50	25 blows for 35mm
End of Borehole								

Additional Comments

Log based on limited returns due to sampling method - depths are approximate.

Continuous dynamic probe put down prior borehole - see separate record.

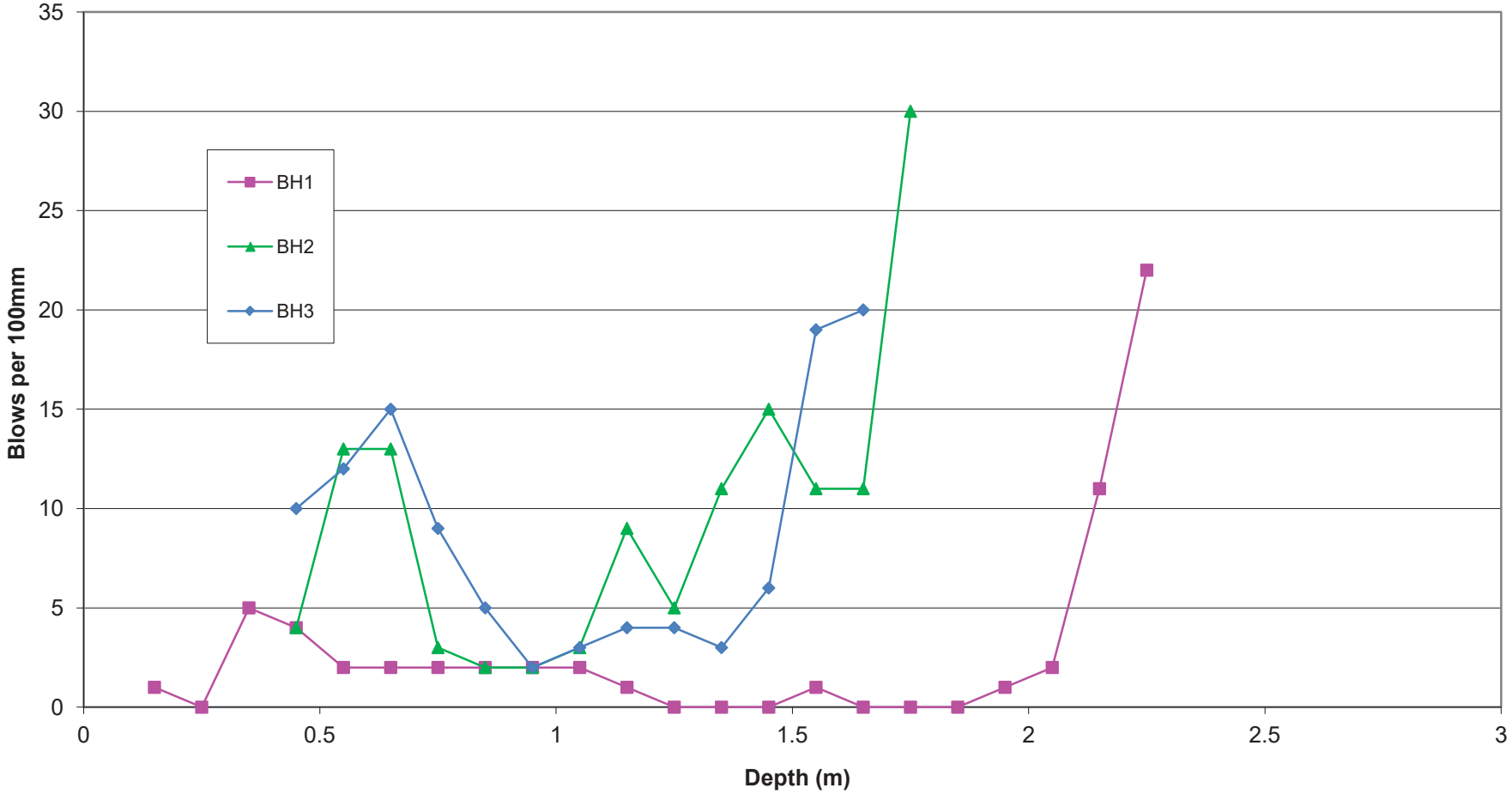
Groundwater: none encountered. No recovery SPT 1.0 - 1.035m.

No recovery SPT 1.0 - 1.035m.

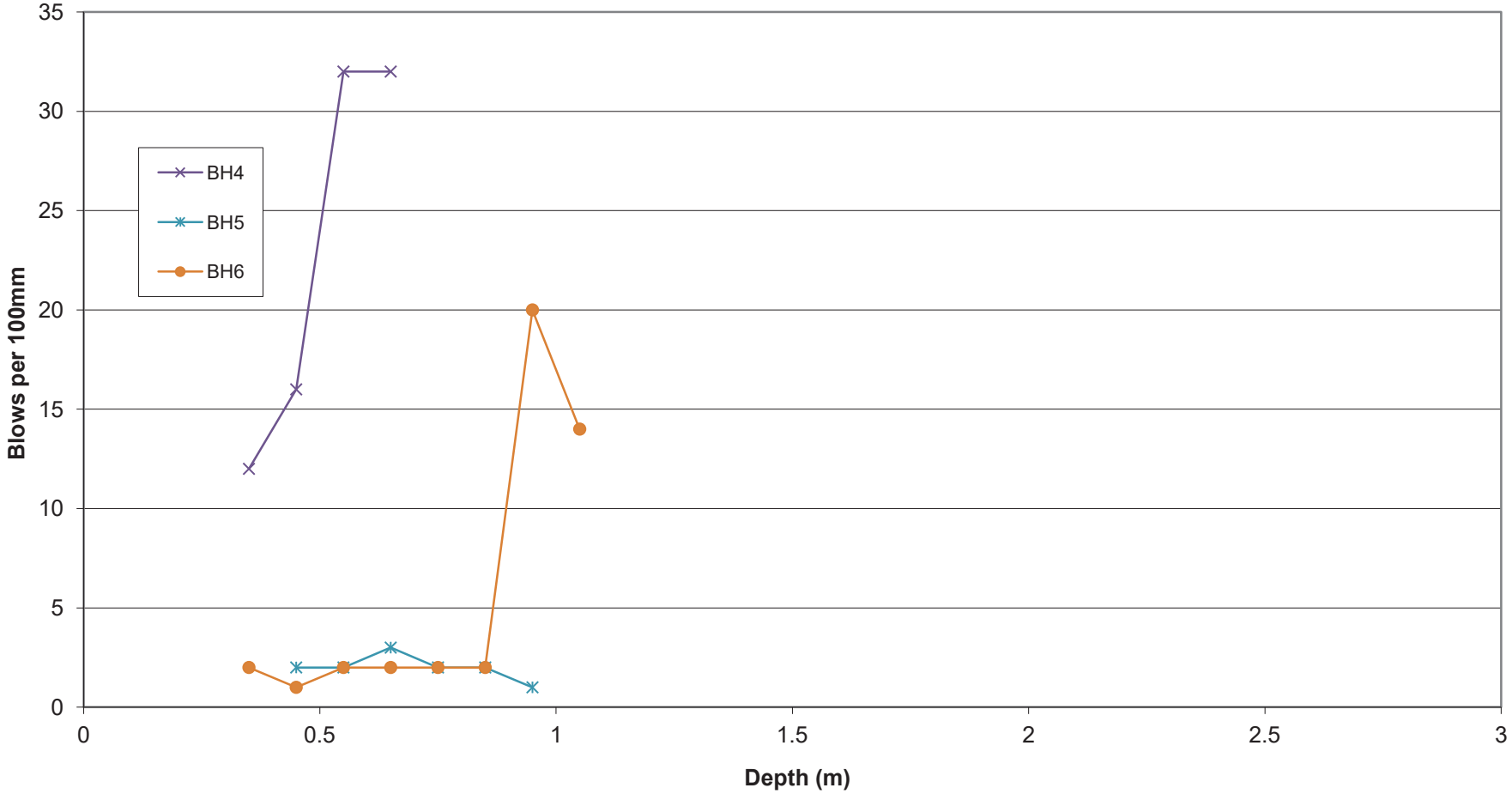
Logged by GLD

Figure

17-1844 Former Moorlands Public House, Leek
Dynamic Probe Test Results (DPSH Method) Sheet 1 of 2



17-1844 Former Moorlands Public House, Leek
Dynamic Probe Test Results (DPSH Method) Sheet 2 of 2



APPENDIX D
LABORATORY TEST RESULTS

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
16486942	BH1		0.00 - 0.45	30/10/2017
16486948	BH1		2.00 - 2.15	30/10/2017
16486943	BH2		0.00 - 0.45	30/10/2017
16486949	BH2		1.00	30/10/2017
16486945	BH3		0.00 - 0.50	30/10/2017
16486946	BH4		0.00 - 0.45	30/10/2017
16486947	BH5		0.00 - 0.50	30/10/2017
16486951	BH6		1.00	30/10/2017

Maximum Sample/Coolbox Temperature (°C) : **5.4**

ISO5667-3 Water quality - Sampling - Part3 -

During Transportation samples shall be stored in a cooling device capable of maintaining a temperature of (5±3)°C.

ALS have data which show that a cool box with 4 frozen icepacks is capable of maintaining pre-chilled samples at a temperature of (5±3)°C for a period of up to 24hrs.

Only received samples which have had analysis scheduled will be shown on the following pages.

Validated

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -
S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			16486942			16486948			16486943			16486949			16486945			16486946			16486947			16486951
Customer Sample Reference			BH1			BH1			BH2			BH2			BH3			BH4			BH5			BH6
AGS Reference																								
Depth (m)			0.00 - 0.45			2.00 - 2.15			0.00 - 0.45			1.00			0.00 - 0.50			0.00 - 0.45			0.00 - 0.50			1.00
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Anions by Kone (soil)	All	NDPs: 0 Tests: 8		X		X	X			X			X			X			X			X		X
Asbestos ID in Solid Samples	All	NDPs: 0 Tests: 5	X						X				X			X			X			X		
Boron Water Soluble	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	
Chromium III	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	
Easily Liberated Sulphide	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	
Elemental Sulphur	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	
EPH CWG (Aliphatic) GC (S)	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	
EPH CWG (Aromatic) GC (S)	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	
GRO by GC-FID (S)	All	NDPs: 0 Tests: 5			X			X							X			X			X			
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	
Metals in solid samples by OES	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	
PAH by GCMS	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	
pH	All	NDPs: 0 Tests: 8		X		X	X			X			X			X			X			X		X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 5		X			X							X			X			X			X	

Validated

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

Results Legend

X Test

N No Determination Possible

Sample Types -

S - Soil/Solid
UNS - Unspecified Solid
GW - Ground Water
SW - Surface Water
LE - Land Leachate
PL - Prepared Leachate
PR - Process Water
SA - Saline Water
TE - Trade Effluent
TS - Treated Sewage
US - Untreated Sewage
RE - Recreational Water
DW - Drinking Water Non-regulatory
UNL - Unspecified Liquid
SL - Sludge
G - Gas
OTH - Other

Lab Sample No(s)			16486942	16486948			16486943	16486949		16486945			16486946			16486947			16486951
Customer Sample Reference			BH1	BH1			BH2	BH2		BH3			BH4			BH5			BH6
AGS Reference																				
Depth (m)			0.00 - 0.45	2.00 - 2.15			0.00 - 0.45	1.00		0.00 - 0.50			0.00 - 0.45			0.00 - 0.50			1.00
Container			1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB	1kg TUB	250g Amber Jar (ALE210)	60g VOC (ALE215)	1kg TUB
Sample Type			S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
Sample description	All	NDPs: 0 Tests: 8		X		X		X		X		X			X			X		X
Total Organic Carbon	All	NDPs: 0 Tests: 5		X				X				X			X			X		
Total Sulphate	All	NDPs: 0 Tests: 5		X				X				X			X			X		
TPH CWG GC (S)	All	NDPs: 0 Tests: 5		X				X				X			X			X		

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

Sample Descriptions

Grain Sizes

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm

Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Inclusions	Inclusions 2
16486942	BH1	0.00 - 0.45	Dark Brown	Sandy Clay	Crushed Brick	Stones
16486948	BH1	2.00 - 2.15	Dark Brown	Sandy Clay	Stones	None
16486943	BH2	0.00 - 0.45	Dark Brown	Sandy Clay	Crushed Brick	Stones
16486949	BH2	1.00	Light Brown	Sandy Loam	Stones	None
16486945	BH3	0.00 - 0.50	Dark Brown	Sandy Clay	Crushed Brick	Stones
16486946	BH4	0.00 - 0.45	Dark Brown	Sandy Clay	Stones	None
16486947	BH5	0.00 - 0.50	Dark Brown	Sandy Clay	Crushed Brick	Stones
16486951	BH6	1.00	Dark Brown	Loamy Sand	Stones	None

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

Validated

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH1	BH2	BH2	BH3	BH4
			Depth (m)	0.00 - 0.45	2.00 - 2.15	0.00 - 0.45	1.00	0.00 - 0.50	0.00 - 0.45
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	30/10/2017	30/10/2017	30/10/2017	30/10/2017	30/10/2017	30/10/2017
			Sample Time	.	.	.	.	.	.
			Date Received	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017
			SDG Ref	171103-68	171103-68	171103-68	171103-68	171103-68	171103-68
			Lab Sample No.(s)	16486942	16486948	16486943	16486949	16486945	16486946
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		13	11	15	11	12	9.5
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M		<0.05 M		<0.01 M	<0.01 M
Cresols	<0.01 mg/kg	TM062 (S)		0.0345 M		0.55 M		0.0228 M	<0.01 M
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M		1.8 M		0.0342 M	<0.015 M
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M		2.35 M		0.057 M	<0.035 M
Soil Organic Matter (SOM)	<0.35 %	TM132		3.29 #		49 #		10.7 #	1.03 #
pH	1 pH Units	TM133		8.25 M	7.61 M	8.24 M	5.42 M	8.71 M	11.1 M
Sulphur, Elemental	<10 mg/kg	TM136		393 M		2630 M		300 M	109 M
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #		<0.6 #		<0.6 #	<0.6 #
Cyanide, Total	<1 mg/kg	TM153		<1 M		5.08 M		<1 M	<1 M
Sulphide, Easily liberated	<15 mg/kg	TM180		<15 @ M		55.3 @ M		20.1 @ M	<15 @ M
Chromium, Trivalent	<0.9 mg/kg	TM181		4.72		<0.9		1.63	3.52
Arsenic	<0.6 mg/kg	TM181		4.8 M		13.4 M		3.53 M	4.16 M
Cadmium	<0.02 mg/kg	TM181		0.568 M		0.472 M		0.326 M	0.428 M
Chromium	<0.9 mg/kg	TM181		4.72 M		<0.9 M		1.63 M	3.52 M
Copper	<1.4 mg/kg	TM181		14.9 M		30.1 M		121 M	5.09 M
Lead	<0.7 mg/kg	TM181		35 M		62.7 M		19.5 M	18.2 M
Mercury	<0.14 mg/kg	TM181		0.388 M		0.429 M		0.361 M	0.264 M
Nickel	<0.2 mg/kg	TM181		8.45 M		14.8 M		12.9 M	5.84 M
Selenium	<1 mg/kg	TM181		<1 #		<1 #		<1 #	<1 #
Vanadium	<0.2 mg/kg	TM181		14.6 #		17.6 #		16.3 #	10.1 #
Zinc	<1.9 mg/kg	TM181		48.9 M		122 M		37 M	36.1 M
Sulphate, Total	<48 mg/kg	TM221		478 M		343 M		644 M	897 M
Boron, water soluble	<1 mg/kg	TM222		<1 M		<1 M		<1 M	<1 M
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243		<0.004 M	0.0232 M	0.0105 M	0.0157 M	0.0316 M	0.12 M

Validated

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH5	BH6				
			Depth (m)	0.00 - 0.50	1.00				
			Sample Type	Soil/Solid (S)	Soil/Solid (S)				
			Date Sampled	30/10/2017	30/10/2017				
			Sample Time	.	.				
			Date Received	02/11/2017	02/11/2017				
			SDG Ref	171103-68	171103-68				
			Lab Sample No.(s)	16486947	16486951				
			AGS Reference						
Moisture Content Ratio (% of as received sample)	%	PM024		17	10				
Phenol	<0.01 mg/kg	TM062 (S)		<0.01 M					
Cresols	<0.01 mg/kg	TM062 (S)		<0.01 M					
Xylenols	<0.015 mg/kg	TM062 (S)		<0.015 M					
Phenols, Total Detected monohydric	<0.035 mg/kg	TM062 (S)		<0.035 M					
Soil Organic Matter (SOM)	<0.35 %	TM132		14.3 #					
pH	1 pH Units	TM133		8.57 M	8.09 M				
Sulphur, Elemental	<10 mg/kg	TM136		159 M					
Chromium, Hexavalent	<0.6 mg/kg	TM151		<0.6 #					
Cyanide, Total	<1 mg/kg	TM153		<1 M					
Sulphide, Easily liberated	<15 mg/kg	TM180		<15 @ M					
Chromium, Trivalent	<0.9 mg/kg	TM181		<0.9					
Arsenic	<0.6 mg/kg	TM181		7.91 M					
Cadmium	<0.02 mg/kg	TM181		0.91 M					
Chromium	<0.9 mg/kg	TM181		<0.9 M					
Copper	<1.4 mg/kg	TM181		53 M					
Lead	<0.7 mg/kg	TM181		66.2 M					
Mercury	<0.14 mg/kg	TM181		0.619 M					
Nickel	<0.2 mg/kg	TM181		23.8 M					
Selenium	<1 mg/kg	TM181		<1 #					
Vanadium	<0.2 mg/kg	TM181		34.6 #					
Zinc	<1.9 mg/kg	TM181		268 M					
Sulphate, Total	<48 mg/kg	TM221		424 M					
Boron, water soluble	<1 mg/kg	TM222		<1 M					
Water Soluble Sulphate as SO4 2:1 Extract	<0.004 g/l	TM243		0.013 M	<0.004 M				

Validated

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

PAH by GCMS

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5
			Depth (m)	0.00 - 0.45	0.00 - 0.45	0.00 - 0.50	0.00 - 0.45	0.00 - 0.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	30/10/2017	30/10/2017	30/10/2017	30/10/2017	30/10/2017
			Sample Time	.	.	.	.	.
			Date Received	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017
			SDG Ref	171103-68	171103-68	171103-68	171103-68	171103-68
			Lab Sample No.(s)	16486942	16486943	16486945	16486946	16486947
			AGS Reference					
Naphthalene-d8 % recovery**	%	TM218		104	102	89.3	87.5	97.7
Acenaphthene-d10 % recovery**	%	TM218		109	102	87	89.4	101
Phenanthrene-d10 % recovery**	%	TM218		110	103	89.1	90.2	98.1
Chrysene-d12 % recovery**	%	TM218		118	117	107	97.1	105
Perylene-d12 % recovery**	%	TM218		124	126	117	104	106
Naphthalene	<9 µg/kg	TM218		50.9 M	10700 M	380 M	13.5 M	769 M
Acenaphthylene	<12 µg/kg	TM218		185 M	19400 M	861 M	47.1 M	411 M
Acenaphthene	<8 µg/kg	TM218		1060 M	13400 M	1050 M	464 M	326 M
Fluorene	<10 µg/kg	TM218		591 M	37900 M	1650 M	356 M	409 M
Phenanthrene	<15 µg/kg	TM218		8660 M	240000 M	27900 M	4730 M	5310 M
Anthracene	<16 µg/kg	TM218		2410 M	97500 M	7170 M	926 M	1730 M
Fluoranthene	<17 µg/kg	TM218		30100 M	425000 M	56000 M	7780 M	11400 M
Pyrene	<15 µg/kg	TM218		25400 M	333000 M	49000 M	6330 M	10100 M
Benz(a)anthracene	<14 µg/kg	TM218		13800 M	232000 M	33700 M	3120 M	7860 M
Chrysene	<10 µg/kg	TM218		10700 M	180000 M	23400 M	2490 M	6770 M
Benzo(b)fluoranthene	<15 µg/kg	TM218		15600 M	234000 M	45400 M	3370 M	10500 M
Benzo(k)fluoranthene	<14 µg/kg	TM218		6700 M	102000 M	18500 M	1270 M	4400 M
Benzo(a)pyrene	<15 µg/kg	TM218		13700 M	218000 M	40400 M	2760 M	8900 M
Indeno(1,2,3-cd)pyrene	<18 µg/kg	TM218		6840 M	97000 M	22000 M	1320 M	4800 M
Dibenzo(a,h)anthracene	<23 µg/kg	TM218		2030 M	35700 M	6150 M	369 M	1590 M
Benzo(g,h,i)perylene	<24 µg/kg	TM218		7810 M	98900 M	24100 M	1550 M	5200 M
PAH, Total Detected USEPA 16	<118 µg/kg	TM218		146000	2370000	358000	36900	80500

Validated

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

TPH CWG (S)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
aq	Aqueous / settled sample.
diss.filt	Dissolved / filtered sample.
tot.unfilt	Total / unfiltered sample.
*	Subcontracted test.
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-5&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH1	BH2	BH3	BH4	BH5
			Depth (m)	0.00 - 0.45	0.00 - 0.45	0.00 - 0.50	0.00 - 0.45	0.00 - 0.50
			Sample Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
			Date Sampled	30/10/2017	30/10/2017	30/10/2017	30/10/2017	30/10/2017
			Sample Time	.	.	.	.	.
			Date Received	02/11/2017	02/11/2017	02/11/2017	02/11/2017	02/11/2017
			SDG Ref	171103-68	171103-68	171103-68	171103-68	171103-68
			Lab Sample No.(s)	16486942	16486943	16486945	16486946	16486947
			AGS Reference					
GRO Surrogate % recovery**	%	TM089		101	40	77	94	52
GRO TOT (Moisture Corrected)	<44 µg/kg	TM089		<44 M	1130 M	295 M	338 M	<44 M
Methyl tertiary butyl ether (MTBE)	<5 µg/kg	TM089		<5 #	<5 #	<5 #	<5 #	<5 #
Benzene	<10 µg/kg	TM089		<10 M	17.6 M	<10 M	<10 M	<10 M
Toluene	<2 µg/kg	TM089		<2 M	19.9 M	6.84 M	<2 M	7.2 M
Ethylbenzene	<3 µg/kg	TM089		<3 M	4.68 M	<3 M	<3 M	<3 M
m,p-Xylene	<6 µg/kg	TM089		<6 M	24.6 M	<6 M	<6 M	<6 M
o-Xylene	<3 µg/kg	TM089		<3 M	11.7 M	<3 M	<3 M	<3 M
sum of detected mpo xylene by GC	<9 µg/kg	TM089		<9	36.3	<9	<9	<9
sum of detected BTEX by GC	<24 µg/kg	TM089		<24	78.5	<24	<24	<24
Aliphatics >C5-C6	<10 µg/kg	TM089		<10	11.7	<10	<10	<10
Aliphatics >C6-C8	<10 µg/kg	TM089		<10	49.1	34.2	<10	<10
Aliphatics >C8-C10	<10 µg/kg	TM089		<10	166	59.3	19.8	<10
Aliphatics >C10-C12	<10 µg/kg	TM089		<10	426	79.8	174	<10
Aliphatics >C12-C16	<100 µg/kg	TM173		1940	65900	3760	3670	4580
Aliphatics >C16-C21	<100 µg/kg	TM173		2950	176000	13100	5070	10100
Aliphatics >C21-C35	<100 µg/kg	TM173		20200	354000	38000	22800	30700
Aliphatics >C35-C44	<100 µg/kg	TM173		19700	53700	20400	26000	2190
Total Aliphatics >C12-C44	<100 µg/kg	TM173		44800	650000	75300	57500	47500
Aromatics >EC5-EC7	<10 µg/kg	TM089		<10	17.6	<10	<10	<10
Aromatics >EC7-EC8	<10 µg/kg	TM089		<10	19.9	<10	<10	<10
Aromatics >EC8-EC10	<10 µg/kg	TM089		<10	152	50.2	13.2	<10
Aromatics >EC10-EC12	<10 µg/kg	TM089		<10	284	53.6	116	<10
Aromatics >EC12-EC16	<100 µg/kg	TM173		5910	402000	18000	10500	12300
Aromatics >EC16-EC21	<100 µg/kg	TM173		86500	2670000	294000	105000	92300
Aromatics >EC21-EC35	<100 µg/kg	TM173		269000	5980000	768000	207000	337000
Aromatics >EC35-EC44	<100 µg/kg	TM173		100000	942000	189000	84900	93100
Aromatics >EC40-EC44	<100 µg/kg	TM173		39000	287000	64500	34500	31700
Total Aromatics >EC12-EC44	<100 µg/kg	TM173		462000	9990000	1270000	407000	535000
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg	TM173		507000	10600000	1340000	465000	582000

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

Asbestos Identification - Solid Samples

		Date of Analysis	Analysed By	Comments	Amosite (Brown) Asbestos	Chrysotile (White) Asbestos	Crocidolite (Blue) Asbestos	Fibrous Actinolite	Fibrous Anthophyllite	Fibrous Tremolite	Non-Asbestos Fibre
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH1 0.00 - 0.45 SOLID 30/10/2017 00:00:00 04/11/2017 13:05:34 171103-68 16486942 TM048	09/11/2017	Neville Mann	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH2 0.00 - 0.45 SOLID 30/10/2017 00:00:00 04/11/2017 13:10:04 171103-68 16486943 TM048	09/11/2017	Neville Mann	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH3 0.00 - 0.50 SOLID 30/10/2017 00:00:00 04/11/2017 13:08:26 171103-68 16486945 TM048	09/11/2017	Neville Mann	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH4 0.00 - 0.45 SOLID 30/10/2017 00:00:00 04/11/2017 13:17:46 171103-68 16486946 TM048	08/11/2017	Neville Mann	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected
Cust. Sample Ref. Depth (m) Sample Type Date Sampled Date Receieved SDG Original Sample Method Number	BH5 0.00 - 0.50 SOLID 30/10/2017 00:00:00 04/11/2017 13:18:57 171103-68 16486947 TM048	09/11/2017	Neville Mann	-	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected (#)	Not Detected

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
TM048	HSG 248, Asbestos: The analysts' guide for sampling, analysis and clearance procedures	Identification of Asbestos in Bulk Material		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)		
TM132	In - house Method	ELTRA CS800 Operators Guide		
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter		
TM136	Method 17.10, Second Site property, March 2003	Determination of Sulphur by HPLC		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the Skalar SANS+ System Segmented Flow Analyser		
TM173	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID		
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)'	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by iCap 6500 Duo ICP-OES		
TM218	Determination of PAH by GCMS Microwave extraction	The determination of PAH in soil samples by microwave extraction and GC-MS		
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		
TM243		Mixed Anions In Soils By Kone		

[1] Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

Chemical testing (unless subcontracted) performed at ALS Environmental Hawarden (Method codes TM) or ALS Environmental Aberdeen (Method codes S).

CERTIFICATE OF ANALYSIS

SDG:	171103-68	**Client Reference:**	17-1844	**Report Number:**	432588
Location:	Pride of the Moorlands PH,	**Order Number:**	1844	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	16486942	16486948	16486943	16486949	16486945	16486946	16486947	16486951
Customer Sample Ref.	BH1	BH1	BH2	BH2	BH3	BH4	BH5	BH6
AGS Ref.								
Depth	0.00 - 0.45	2.00 - 2.15	0.00 - 0.45	1.00	0.00 - 0.50	0.00 - 0.45	0.00 - 0.50	1.00
Type	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)	Soil/Solid (S)
Anions by Kone (soil)	08-Nov-2017	09-Nov-2017	08-Nov-2017	09-Nov-2017	08-Nov-2017	08-Nov-2017	08-Nov-2017	09-Nov-2017
Asbestos ID in Solid Samples	09-Nov-2017		09-Nov-2017		09-Nov-2017	08-Nov-2017	09-Nov-2017	
Boron Water Soluble	08-Nov-2017		08-Nov-2017		08-Nov-2017	08-Nov-2017	08-Nov-2017	
Chromium III	09-Nov-2017		09-Nov-2017		09-Nov-2017	09-Nov-2017	09-Nov-2017	
Cyanide Comp/Free/Total/Thiocyanate	08-Nov-2017		08-Nov-2017		08-Nov-2017	08-Nov-2017	08-Nov-2017	
Easily Liberated Sulphide	09-Nov-2017		09-Nov-2017		09-Nov-2017	10-Nov-2017	09-Nov-2017	
Elemental Sulphur	09-Nov-2017		09-Nov-2017		09-Nov-2017	09-Nov-2017	09-Nov-2017	
EPH CWG (Aliphatic) GC (S)	09-Nov-2017		09-Nov-2017		09-Nov-2017	09-Nov-2017	09-Nov-2017	
EPH CWG (Aromatic) GC (S)	09-Nov-2017		09-Nov-2017		09-Nov-2017	09-Nov-2017	09-Nov-2017	
GRO by GC-FID (S)	08-Nov-2017		08-Nov-2017		08-Nov-2017	08-Nov-2017	08-Nov-2017	
Hexavalent Chromium (s)	08-Nov-2017		08-Nov-2017		08-Nov-2017	08-Nov-2017	08-Nov-2017	
Metals in solid samples by OES	09-Nov-2017		09-Nov-2017		09-Nov-2017	09-Nov-2017	09-Nov-2017	
PAH by GCMS	08-Nov-2017		08-Nov-2017		09-Nov-2017	08-Nov-2017	08-Nov-2017	
pH	08-Nov-2017	07-Nov-2017	07-Nov-2017	07-Nov-2017	08-Nov-2017	08-Nov-2017	07-Nov-2017	07-Nov-2017
Phenols by HPLC (S)	09-Nov-2017		09-Nov-2017		09-Nov-2017	09-Nov-2017	09-Nov-2017	
Sample description	04-Nov-2017	04-Nov-2017	04-Nov-2017	04-Nov-2017	04-Nov-2017	04-Nov-2017	04-Nov-2017	04-Nov-2017
Total Organic Carbon	14-Nov-2017		14-Nov-2017		14-Nov-2017	14-Nov-2017	14-Nov-2017	
Total Sulphate	09-Nov-2017		09-Nov-2017		09-Nov-2017	09-Nov-2017	09-Nov-2017	
TPH CWG GC (S)	09-Nov-2017		09-Nov-2017		09-Nov-2017	09-Nov-2017	09-Nov-2017	

Appendix General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICs and SVOC TICs.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 6 months after the analysis date. All bulk samples will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALS reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible (NDP). The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP - No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals - total metals must be requested separately.

11. Results relate only to the items tested.

12. LoDs (Limit of Detection) for wet tests reported on a dry weight basis are not corrected for moisture content.

13. **Surrogate recoveries** - Surrogates are added to your sample to monitor recovery of the test requested. A % recovery is reported, results are not corrected for the recovery measured. Typical recoveries for organics tests are 70-130%, they are generally wider for volatiles analysis, 50-150%. Recoveries in soils are affected by organic rich or clay rich matrices. Waters can be affected by remediation fluids or high amounts of sediment. Test results are only ever reported if all of the associated quality checks pass; it is assumed that all recoveries outside of the values above are due to matrix affect.

14. **Product analyses** - Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethyphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For leachate preparations other than Zero Headspace Extraction (ZHE) volatile loss may occur.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C5-C12 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

24. **Tentatively Identified Compounds (TICs)** are non-target peaks in VOC and SVOC analysis. All non-target peaks detected with a concentration above the LoD are subjected to a mass spectral library search. Non-target peaks with a library search confidence of >75% are reported based on the best mass spectral library match. When a non-target peak with a library search confidence of <75% is detected it is reported as “mixed hydrocarbons”. Non-target compounds identified from the scan data are semi-quantified relative to one of the deuterated internal standards, under the same chromatographic conditions as the target compounds. This result is reported as a semi-quantitative value and reported as Tentatively Identified Compounds (TICs). TICs are outside the scope of UKAS accreditation and are not moisture corrected.

Sample Deviations

If a sample is classed as deviated then the associated results may be compromised.

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
5	**Samples exceeded holding time before presevation was performed**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials which have been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using ALS (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysotile	White Asbestos
Amosite	Brown Asbestos
Crocidolite	Blue Asbestos
Fibrous Actinolite	-
Fibrous Anthophyllite	-
Fibrous Tremolite	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: - Trace - Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

APPENDIX D
GENERIC RTM LEVEL 1 SCREENING VALUES

SLADEN ASSOCIATES

DERIVATION OF GENERIC PRELIMINARY LEVEL 1 SCREENING FOR LEACHABLE METALS

Development of Level 1 Remedial Targets in accordance with the document 'Remedial Targets Methodology: Hydrogeological risk assessment for land contamination (Environment Agency 2006) for some metals can be undertaken in a generic manner.

For such potential contaminants, Table 5.1 of that document gives the following equation for Level 1 Soil Remedial Target (RTs (mg/kg)):

$RTs = Cs = Ct . [Kd + ((\theta w + \theta a . H) / \rho)]$

Where:

Kd = Soil water partition coefficient (l/kg)

θw = Water-filled soil porosity

θa = Air-filled soil porosity

H = Henry's Law constant (dimensionless)

ρ = bulk density (g/cm^3)

Ct = Target Concentration (mg/kg)

Cs = Total soil concentration (mg/kg)

Such materials are those where the ratio $(\theta w + \theta a . H) / \rho$ is small compared to Kd and may therefore be ignored such that:

$RTs = Cs = Ct . Kd$

Values of Kd have been suggested by Lijzen et al 2001 (RIVM Report 711701 023) or, for Boron (RIVM Report 715810 004, 1994). Ct is generally been taken to be the relevant Environmental Quality Standard (EQS) level. Where no EQS has been published, the relevant drinking water standard (DWS) has been used. However, for the phytotoxins copper and zinc, the EQS results in unreasonably low screening values and the lower leaching limit Waste Acceptance Criteria (WAC) for inert waste have been used.

Contaminant	Kp	EQS/DWS/WAC Ct	Level 1 RTs
Arsenic	1800	0.05	90
Boron	10	2	20
Cadmium	2560	0.005	12.8
Chromium (Total)	4800	0.02	96
Lead	36000	0.02	720
Mercury	7500	0.001	7.5
Selenium	300	0.01	3
Zinc	2600	0.4	1040
Copper	2120	0.2	424
Nickel	2000	0.04	80

Where possible, for samples where the total soil concentration exceeds the Level 1 RTs, testing is undertaken to measure the actual leachable concentration of the relevant potential contaminant in that sample.