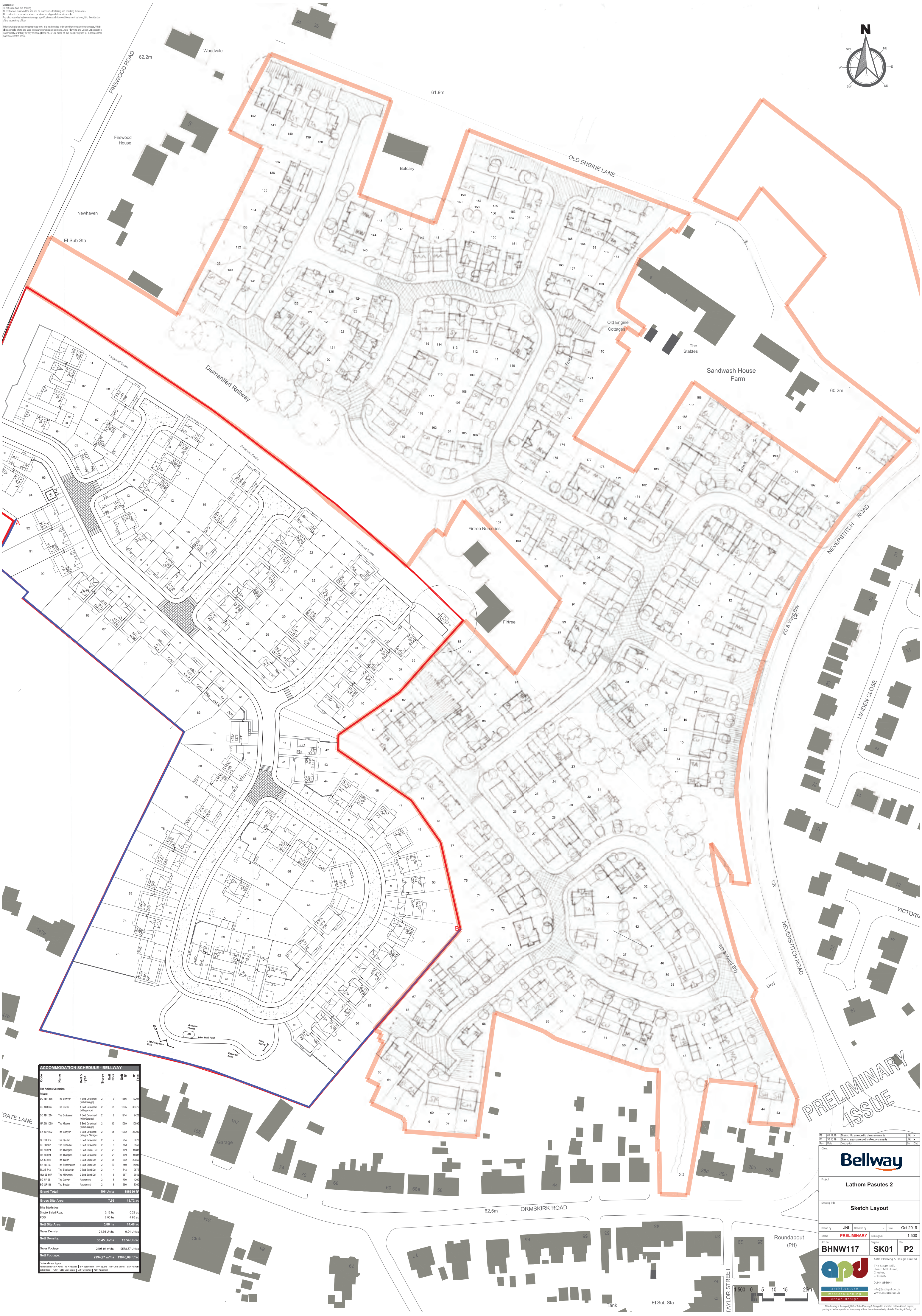
DRAWINGS

Disclaimer:
Do not scale from this drawing
All contractors must visit the site and be responsible for taking and checking dimensions.
All construction information should be taken from figured dimensions only.
Any discrepancies between drawings, specifications and site conditions must be brought to the attention of the supervising officer.

This drawing is for planning purposes only. It is not intended to be used for construction purposes. Whilst all reasonable efforts are used to ensure drawings are accurate, Astle Planning and Design Ltd accept no responsibility or liability for any reliance placed on, or use made of, this plan by anyone for purposes other than those stated above.



ACCOMMODATION SCHEDULE - BELLWAY

Code	Name	Bed & Type	Storey	Unit No's	Unit ft²	ft² Total
The Artisan Collection						
Private						
BO 4B 1356	The Bowyer	4 Bed Detached (with Garage)	2	9	1356	12204
CU 4B1335	The Cutler	4 Bed Detached (with garage)	2	25	1335	33375
SC 4B 1214	The Scrivener	4 Bed Detached (with Garage)	2	2	1214	2428
MA 3B 1059	The Mason	3 Bed Detached (with Garage)	2	10	1059	10590
SY 3B 1092	The Sawyer	3 Bed Detached (Integral Garage)	2	25	1092	27300
QU 3B 954	The Quilter	3 Bed Detached	2	7	954	6678
CH 3B 951	The Chandler	3 Bed Detached	2	9	951	8559
TH 3B 921	The Thespian	3 Bed Semi / Det	2	21	921	19341
TH 3B 921	The Thespian	3 Bed Detached	2	21	921	19341
TA 3B 802	The Tailor	3 Bed Semi Det	2	25	802	20050
SH 3B 750	The Shoemaker	3 Bed Semi Det	2	20	750	15000
BL 2B 643	The Blacksmith	2 Bed Semi Det	2	4	643	2572
MW 2B 657	The Millwright	2 Bed Semi Det	1	6	657	3942
SG-FF-2B	The Glover	Apartment	2	6	700	4200
SG-GF-1B	The Souter	Apartment	2	6	550	3300
Grand Total:				**196 Units**		**188880 ft²**
Gross Site Area:				**7.98**		**19.72 ac**
Site Statistics:						
Single Sided Road				0.12 ha		0.29 ac
POS				2.00 ha		4.95 ac
Nett Site Area:				**5.86 ha**		**14.48 ac**
Gross Density:				24.56 Un/ha		9.94 Un/ac
Nett Density:				**33.45 Un/ha**		**13.54 Un/ac**
Gross Footage:				2198.94 m²/ha		9578.57 Un/ac
Nett Footage:				**2994.97 m²/ha**		**13046.09 ft²/ac**

*Note - All Areas Approx.
Abbreviations - ac = Acres | ha = Hectares | ft² = square Feet | m² = square | Un = units Metres | SSR = Single Sided Road | POS = Public Open Space | Det = Detached | Apt = Apartment

1:500 0 5 10 15 25m

Rev.	Date	Description	By	Chd
P2	01.11.19	Sketch / Mix amended to clients comments	JNL	-
P1	30.10.19	Sketch / areas amended to clients comments	JNL	-

Client: Bellway

Project: **Lathom Pasutes 2**

Drawing Title: **Sketch Layout**

Drawn by: JNL	Checked by: -	Date: Oct 2019	
Status: PRELIMINARY	Scale @ A0: 1:500		
Job no.: **BHNW117**	Dwg.no.: **SK01**	Rev.: **P2**	

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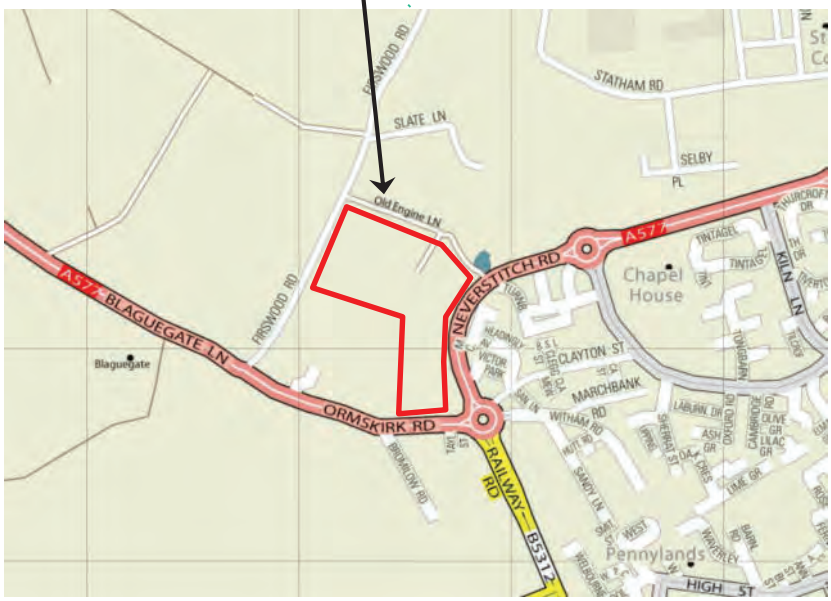
SITE LOCATION

NEAREST POSTCODE: WN8 8EQ



REV	DATE	DESCRIPTION	BY	CKD

BROWNFIELD SOLUTIONS LTD

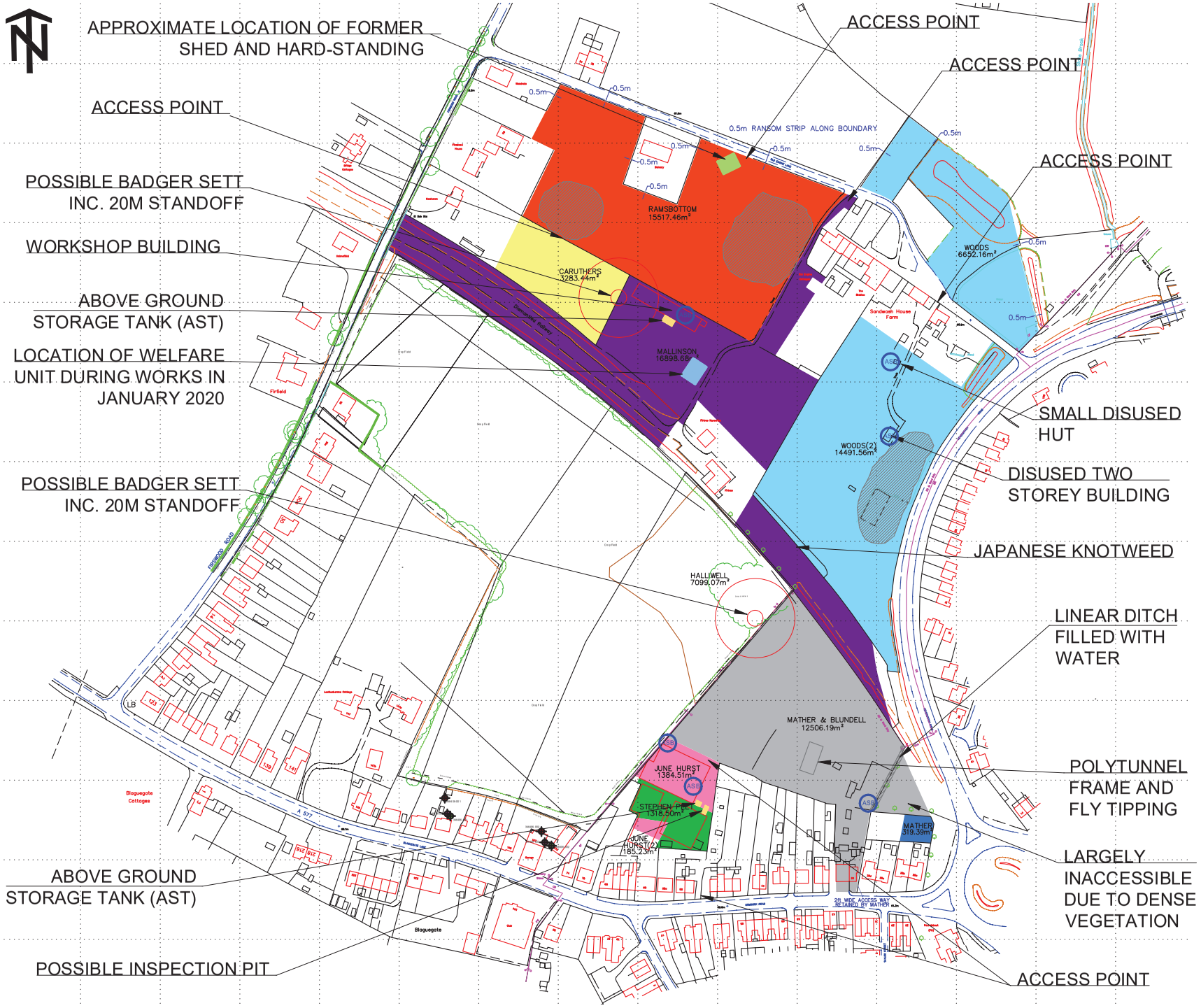
CLIENT
BELLWAY HOMES LTD (NW)

PROJECT TITLE
FIRSWOOD ROAD, SKELMERSDALE

DRAWING TITLE
SITE LOCATION PLAN

DRAWING No.	REVISION	SCALE	DATE
C4380/01	-	NTS	10/02/20

DRAWN BY	CHECKED BY
SD	JMC



LANDOWNERS LEGEND

- CARUTHERS
- RAMSBOTTOM
- MALLINSON
- WOODS
- MATHER & BLUNDELL
- MATHER
- JUNE HURST
- STEPHEN PEET

GENERAL KEY

- POSSIBLE ASBESTOS IDENTIFICATION
- STANDING WATER

NOTES

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REV	DATE	DESCRIPTION	BY	CKD

BROWNFIELD SOLUTIONS LTD

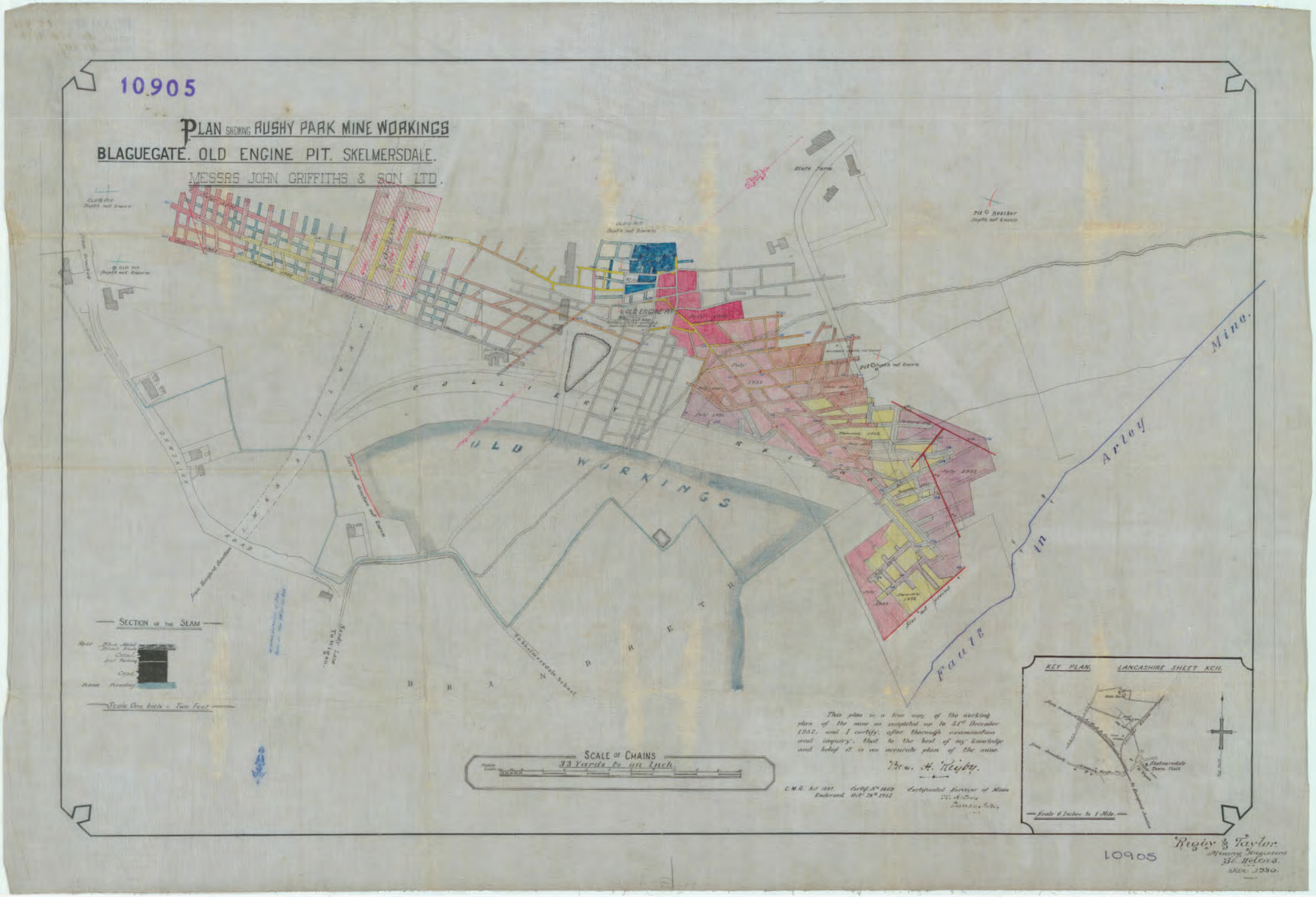
CLIENT: BELLWAY HOMES LTD (NW)

PROJECT TITLE: LATHOM PASTURES (PHASE 2)

DRAWING TITLE: SITE FEATURES PLAN

DRAWING No.	REVISION	SCALE	DATE
C4380/02	-	NTS	22/01/20

DRAWN BY	CHECKED BY
TM	JMC



The Coal Authority

Catalogue No.: 10905 Sheet Info:

Date: 28/07/2015

Scale: 33 YARDS TO 1 INCH (1 TO 1188)

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Hollie Beardsley - The Coal Authority,200 Lichfield Lane,Mansfield,Notts.NG18 4RG,United Kingdom

KEY

- TRIAL PIT (TPXX)
- TRIAL TRENCH (TTXX)
- WINDOW SAMPLE BOREHOLE (WSXX)
- ROTARY OPEN BOREHOLE (ROXX)
- CONJECTURED COAL SEAM
- BOREHOLE INSTALLATION
- POSSIBLE BADGER SETT INCLUDING 20M STAND OFF

NOTES

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REV	DATE	DESCRIPTION	BY	CKD
A	21/11/19	UPDATE FOLLOWING BSL WALKOVER	JMC	AJS
B	19/12/19	UPDATE FOLLOWING DRILLER WALKOVER	TM	JMC
C	21/01/20	UPDATE FOLLOWING INTRUSIVE INVESTIGATION	TM	JMC

BROWNFIELD SOLUTIONS LTD

CLIENT: BELLWAY HOMES LTD (NW)

PROJECT TITLE: LATHOM PASTURES (PHASE 2)

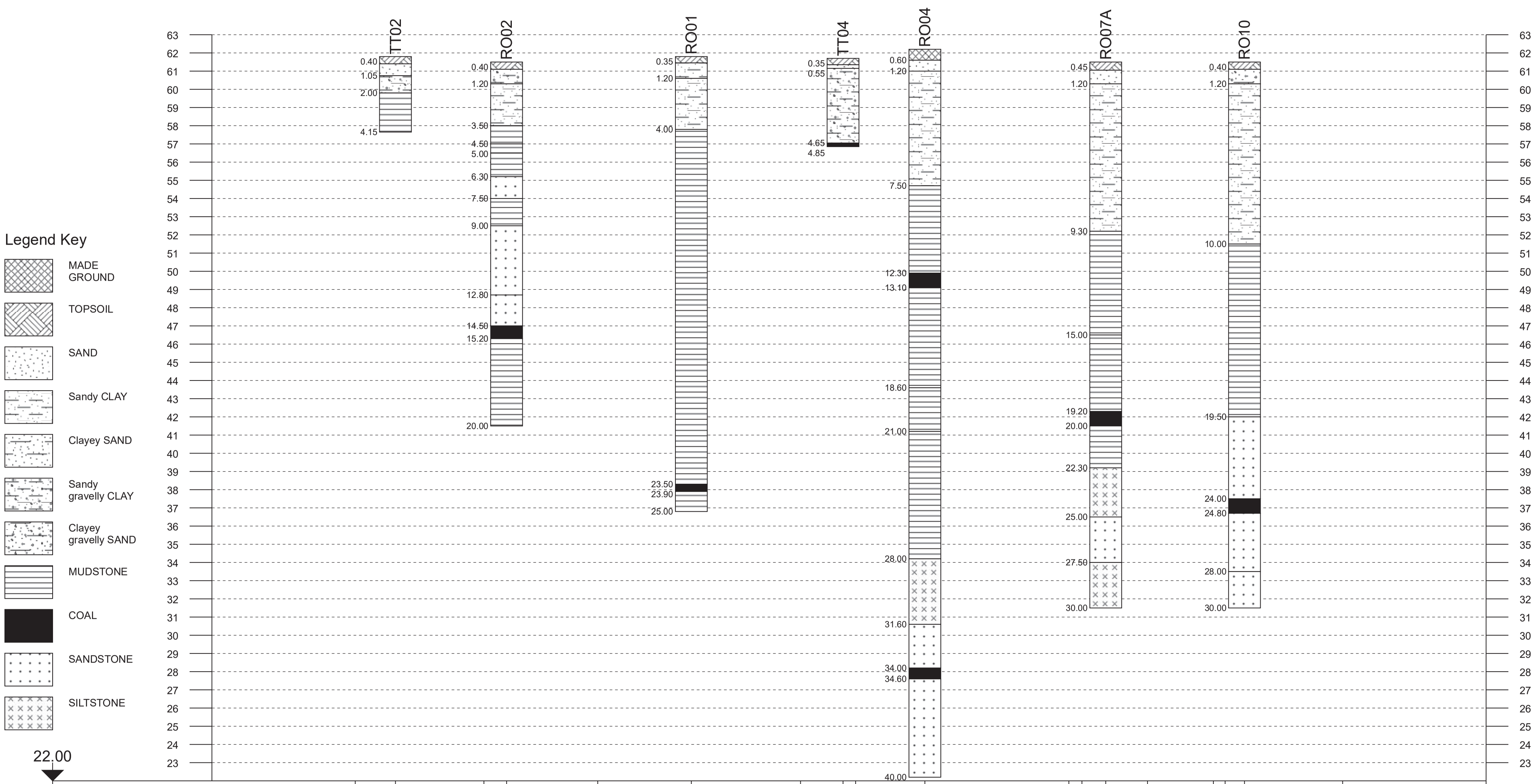
DRAWING TITLE: EXPLORATORY HOLE LOCATION PLAN

DRAWING No.	REVISION	SCALE	DATE
C4380/03	C	NTS	21/01/20

DRAWN BY	CHECKED BY
TM	JMC

Project Id: C4380
Project Title: LATHOM PASTURES (PHASE 2)
Location: SKELMERSDALE
Client: BELLWAY HOMES LIMITED (NORTH WEST)

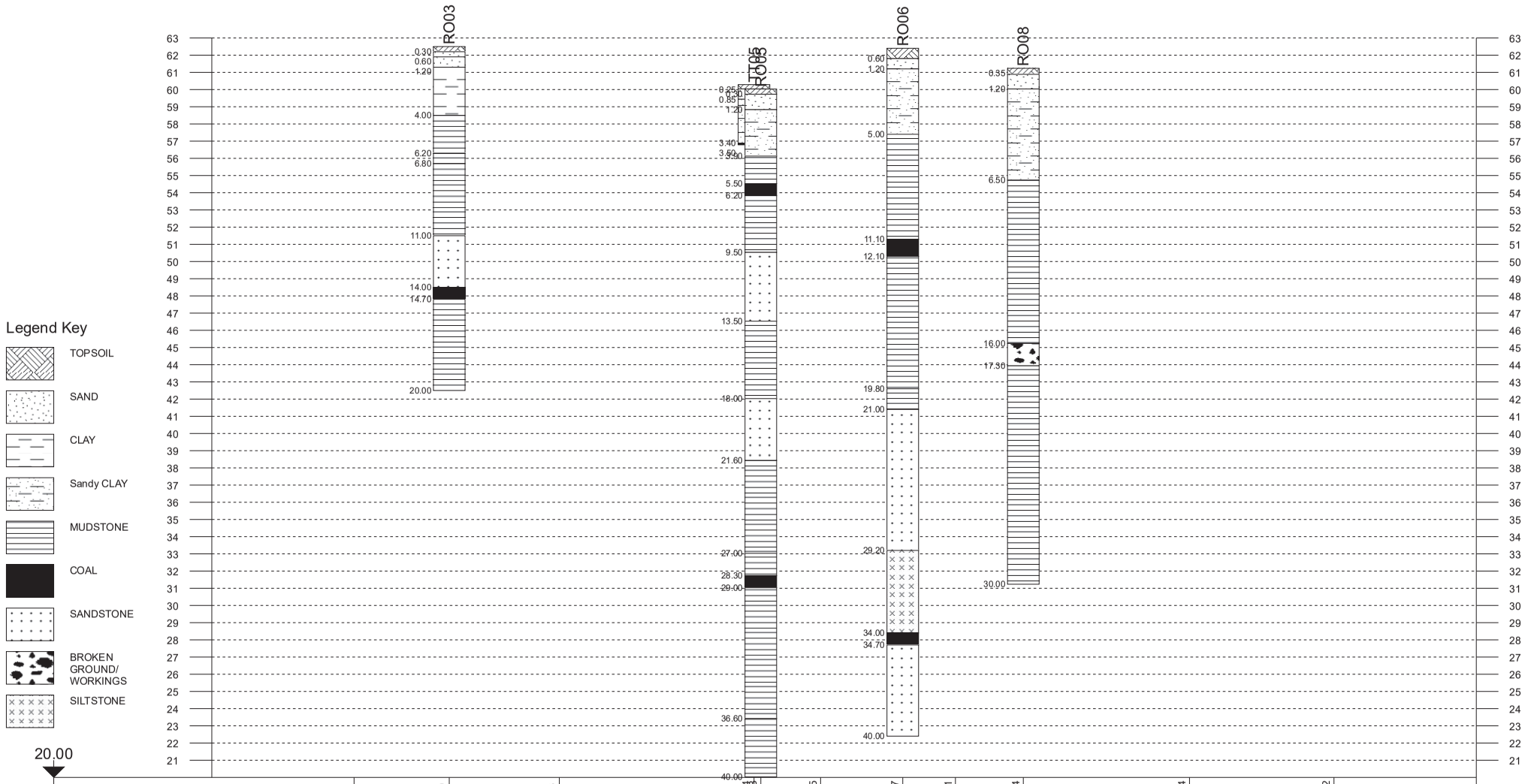
Title: CROSS SECTION A - A'
Vertical Scale: 1:314
Horizontal Scale: 1:2054
Engineer: TM



Chainage (m)	Offset (m)	Elevation (mAOD)
0.00		
14.44	11.85	61.80
46.21	11.03	62.30
54.36	0.97	61.50
87.09	8.29	60.80
120.70	8.68	61.80
159.91	11.16	60.60
175.18	12.93	61.70
179.70	13.33	62.00
204.58	0.08	62.20
256.28	14.41	61.40
260.97	4.21	61.30
269.52	8.24	61.50
284.52	13.94	61.60
308.19	13.34	61.60
312.39	12.64	61.30
319.35	5.40	61.50
354.60		

Project Id: C4380	Title: CROSS SECTION B - B'
Project Title: LATHOM PASTURES (PHASE 2)	Vertical Scale: 1:330
Location: SKELMERSDALE	Horizontal Scale: 1:1783
Client: BELLWAY HOMES LIMITED (NORTH WEST)	Engineer: TM

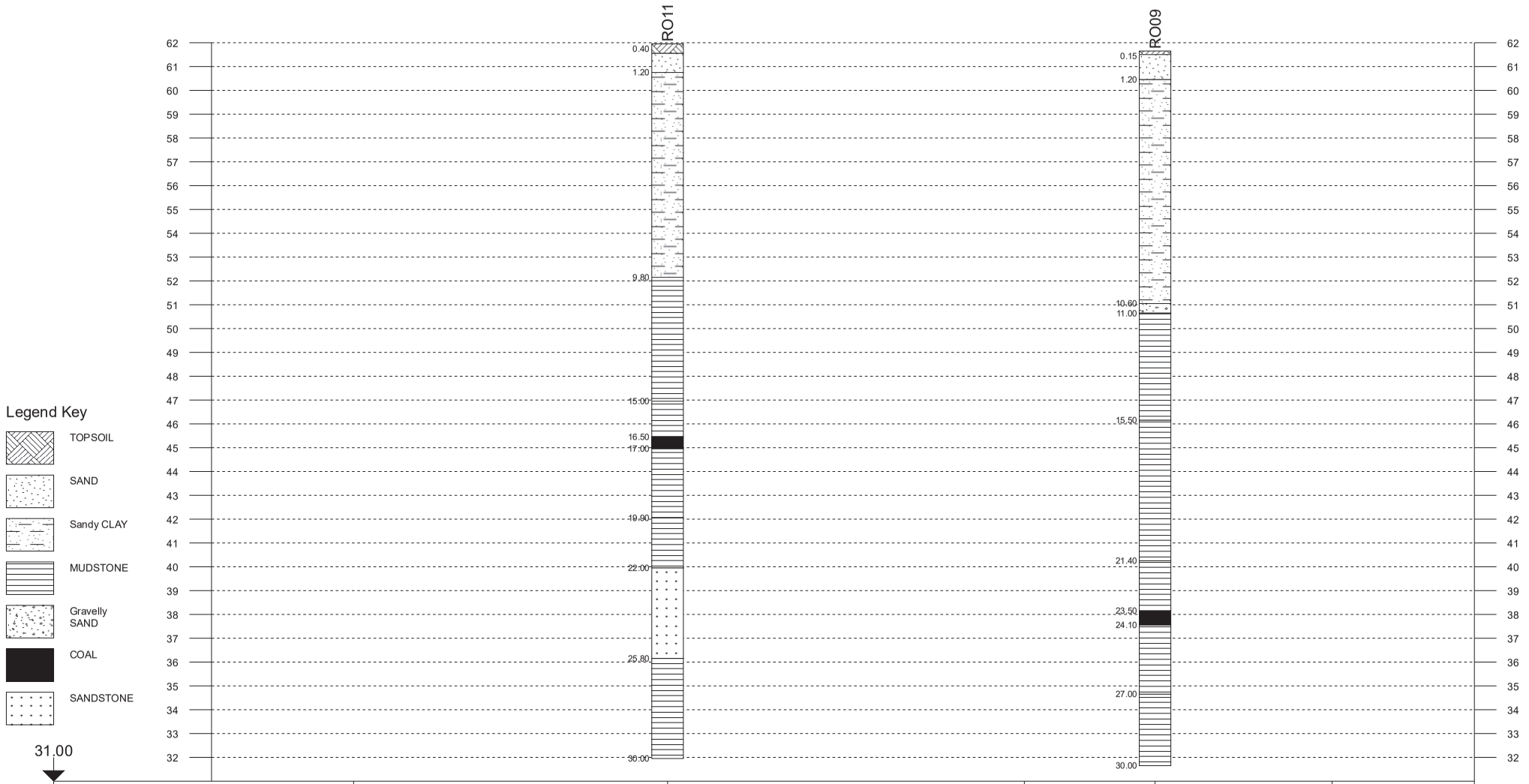
BROWNFIELD SOLUTIONS LTD



Chainage (m)	0.00	29.90	64.48	125.64 127.78	146.55	172.37	188.91	210.24	262.44	307.82
Offset (m)	0.66	1.46	3.68 4.78	7.89	5.92	4.22	6.05	1.02		
Elevation (mAOD)	62.50	62.50	60.29 60.03	59.59	62.40	62.30	61.24	63.50		

Project Id: C4380	Title: CROSS SECTION C - C'
Project Title: LATHOM PASTURES (PHASE 2)	Vertical Scale: 1:238
Location: SKELMERSDALE	Horizontal Scale: 1:562
Client: BELLWAY HOMES LIMITED (NORTH WEST)	Engineer: TM

BROWNFIELD SOLUTIONS LTD



Chainage (m)	0.00	31.13	66.50	79.46	97.01
Offset (m)	1.29	1.35	1.44		
Elevation (mAOD)	61.95	61.66	61.65		

KEY

- TPXX — TRIAL PIT
- TTXX — TRIAL TRENCH
- WSXX — WINDOW SAMPLE BOREHOLE
- ROXX — ROTARY OPEN BOREHOLE
- CONJECTURED COAL SEAM SUBCROP
- REGIONAL BEDROCK DIP DIRECTION
- BOREHOLE INSTALLATION
- COAL RISK ZONE 1 (MODERATE RISK)
- COAL RISK ZONE 2 (LOW RISK)
- COAL RISK ZONE 3 (HIGH RISK)
- COAL RISK ZONE 4 (LOW RISK)
- COAL RISK ZONE 5 (LOW RISK)

NOTES

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REV.	DATE	DESCRIPTION	BY	CKD

BROWNFIELD SOLUTIONS LTD

CLIENT: BELLWAY HOMES LTD (NW)

PROJECT TITLE: LATHOM PASTURES (PHASE 2)

DRAWING TITLE: COAL MINING RISK AREAS

DRAWING No.	REVISION	SCALE	DATE
C4380/04	-	NTS	06/02/20

DRAWN BY	CHECKED BY
TM	AJS

APPENDIX A

BSL Methodology and Guidance

BSL Methodology and Guidance – Geo-Environmental Assessment Reports

This Appendix provides information on the approaches, methods and guidance used by Brownfield Solutions Ltd in the preparation of this report.

The term 'geo-environmental' is used to describe aspects relating to ground-related environmental issues (such as potential soils and groundwater contamination). The term 'geotechnical' is used to describe aspects relating to the physical nature of the site (such as foundation requirements). It should be noted that this is an integrated investigation and these two main aspects are related, unless otherwise specified within the report.

Desk Studies are written in broad agreement with BS 10175:2011+A2:2017. The first stage of a two-staged investigation and assessment of a site is the Preliminary Investigation (BS 10175:2011+A2:2017), often referred to as a Phase 1 Desk Study Assessment, comprising a desk study and walk-over survey, which culminates in the Preliminary Risk Assessment. A preliminary conceptual site model (CSM) is developed. From this are identified any geotechnical and geo-environmental hazards and the qualitative degree of risk associated with them.

From the geo-environmental perspective, the hazard Identification process uses professional judgement to evaluate all the hazards in terms of possible contaminant linkages (of source-pathway-receptor). Possible contaminant linkages are potentially unacceptable risks in terms of the current contaminated land regime legal framework and require either remediation or further assessment. These are normally addressed via intrusive ground investigation and generic risk assessment.

The second stage is the Ground Investigation, Generic Risk Assessment and Geotechnical Interpretation. This represents the further assessment mentioned above. The Ground Investigation comprises field work and laboratory testing based on the findings of the Preliminary Risk Assessment, to reduce uncertainty in the geotechnical and geo-environmental hazard identification. This may include the exploratory, main and supplementary Investigations described in BS 10175:2011+A2:2017.

Legislative Background

Environmental liabilities and risks have been evaluated in terms of a source -pathway - target relationship in accordance with the approach set out in:

- The 1995 Environment Act;
- The Contaminated Land (England) Regulations 2000;
- The DETR circular 02/2000 Environmental Protection Act 1990: Part IIA Contaminated Land.

Contaminated land is defined within the legislative framework as land which is in such condition by reason of substances in, on or under the land that:

1) Significant harm is being caused or there is a significant possibility of such harm being caused;
2) Significant pollution of controlled waters is being or is likely to be caused.

The potential for harm is based on the presence of three factors:

- **Source** - substances that are potential contaminants or pollutants that may cause harm;
- **Pathway** - a potential route by which contaminants can move from the source to the receptor;
- **Receptor** - a receptor that may be harmed, for example the water environment, humans and water.

Where a source, pathway and target are all present a pollutant linkage exists and there is potential for harm to be caused. The presence of a source does not automatically imply that a contamination problem exists, since contamination must be defined in terms of pollutant linkages and unacceptable risk of harm. The nature and importance of both pathways and receptors are site specific and will vary according to the intended end use of the site, its characteristics and its surroundings.

The key principle which supports the SPR approach is 'suitable for use' criteria. This requires remedial action only where contamination is considered to pose unacceptable actual or potential risks to health or the environment and, taking into account the proposed use of the site.

Relevant Guidance Documents
This report has been prepared in accordance with the list of guidance below however the list is not exhaustive:

- DETR Circular 02/2000, Contaminated Land: Implementation of Part IIA of the Environmental Protection Act 1990.
- CLR11 – Model Procedures.
- Brownfields – Managing the development of previously developed land – A client's guide, CIRIA 2002.
- DEFRA and Environment Agency publications CLR7 – 10, supported by the TOX guides and SGV guides, dated March 2002.
- Environment Agency technical advice to third parties on Pollution of Controlled Waters for Part IIA of the EPA1990, May 2002.
- Contamination and Environmental Matters - Their implications for Property Professionals (2nd Edition RICS Nov 2003).
- BS 10175:2011+A2:2017.

Relevant Legislative Documents
The following is a non-exhaustive list of legislative framework documents that has been considered in the production of this report:

- The Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012).
- The Environment Protection Act (1990).
- The Water Resources Act (1991).
- The Environment Act (1995).
- The Contaminated Land (England) Act (2000).
- The Pollution Prevention and Control (England and Wales) Regulations (2000).
- The Landfill Regulations (England and Wales) Regulations (2002).
- The Landfill (England and Wales) (Amendment) Regulations (2004).
- Contaminated Land (England) Regulations (2012).
- Health and Safety at Work Act.

Contaminated Land Risk Assessment

Contaminated Land Risk Assessment is a technique that identifies and considers the associated risk, determines whether the risks are significant and whether action needs to be taken. The four main stages of risk assessment are:

Hazard Identification → Hazard Assessment → Risk Estimation → Risk Evaluation

CLR11 outlines the framework to be followed for risk assessment in the UK. The framework is designed to be consistent with UK legislation and policies including planning. The starting point of the risk assessment is to identify the context of the problem and the objectives of the process. Under CLR11, three tiers of risk assessment exist - Preliminary, Generic Quantitative and Detailed Quantitative.

Formulating and developing a conceptual model for the site is an important requirement of risk assessment, this supports the identification and assessment of pollutant linkages. Development of the conceptual model forms the main part of preliminary risk assessment, and the model is subsequently refined or revised as more information and understanding is obtained through the risk assessment process.

Risk is a combination of the likelihood of an event occurring and the magnitude of its consequences. Therefore, both the likelihood and the consequences of an event must be taken into account when assessing risk.

The risk assessment process needs to take into account the degree of confidence required in decisions. Identification of uncertainties is an essential step in risk assessment.

The likelihood of an event is classified on a four-point system using the following terms and definitions from CIRIA C552:

- **High likelihood**: There is a pollution linkage and an event appears very likely in the short term and almost inevitable over the long term, or there is evidence at the receptor of harm or pollution;

- **Likely**: There is a pollution linkage and all the elements are present and in the right place, which means it is probable that an event will occur. Circumstances are such that the event is not inevitable, but possible in the short term and likely over the long term;

- **Low likelihood**: There is a pollution linkage and circumstances are possible under which an event could occur. However, it is by no means certain even over a longer period such event would take place, and is less likely in the short term;

- **Unlikely**: There is a pollution linkage but circumstances are such that it is improbable the event would occur even in the long term.

The severity is also classified using a system based on CIRIA C552. The terms and definitions are:

- **Severe**: Short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA. Short-term risk of pollution of sensitive water resources. Catastrophic damage to buildings or property. A short-term risk to a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
  Examples – High concentrations of contaminant on surface of recreation area, major spillage of contaminants from site into controlled waters, explosion causing building to collapse;

- **Medium**: Chronic damage to human health ('significant harm' as defined in DETR 2000). Pollution of sensitive water resources. A significant change in a particular ecosystem or organism forming part of that ecosystem (note definition of ecosystem in 'Draft Circular on Contaminated Land', DETR 2000);
  Examples - Concentrations of contaminants exceed the generic assessment criteria, leaching of contaminants from a site to a Principal or Secondary Aquifer, death of species within a designated nature reserve;

- **Mild**: Pollution of non-sensitive water resources. Significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000). Damage to sensitive buildings, structures, services or the environment;
  Examples – Pollution of non-classified groundwater or damage to buildings rendering it unsafe to occupy.

- **Minor**: harm, not necessarily significant harm, which may result in financial loss or expenditure to resolve. Non-permanent health effects to human health (easily prevented by use of personal protective clothing etc). Easily repairable effects of damage to buildings, structures and services.

Examples – Presence of contaminants at such concentrations PPE is required during site work, loss of plants in landscaping scheme or discolouration of concrete.

Once the likelihood and severity have been determined, a risk category can be assigned using the table below.

		Consequences			
		Severe	Medium	Mild	Minor
Probability	Highly likely	Very high	High	Moderate	Moderate/low
	Likely	High	Moderate	Moderate/low	Low
	Low likelihood	Moderate	Moderate/low	Low	Very low
	Unlikely	Moderate/low	Low	Very Low	Very low
	No Linkage	No risk			

Definitions of the risk categories obtained from the above table are as follows together with an assessment of the further work that might be required:

- **Very high**: There is a high probability that severe harm could arise to a designated receptor from an identified hazard or there is evidence that severe harm is currently happening. This risk, if realised, could result in substantial liability. Urgent investigation and remediation are likely to be required;

- **High**: Harm is likely to arise to a designated receptor from an identified hazard. Realisation of the risk is likely to present a substantial liability. Urgent investigation is required and remedial works may be necessary in the short term and are likely over the longer term;

- **Moderate**: It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it would be more likely to be relatively mild. Investigation is normally required to clarify the risk and determine the liability. Some remedial works may be required in the longer term;

- **Low**: It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild;

- **Very Low**: There is a low possibility that harm could arise to a receptor. In the event of such harm being realised, it is not likely to be severe.

Some linkages may be identified which constitutes a theoretical connection between a source and a receptor, but professional judgement shows them not to be possible for some reason. These are labelled 'no linkage' in the summary table and no further action is required.

Ground Gas Guidance

Redevelopment on brownfield sites is an ever increasing occurrence, including those sites where a potential ground gas issue is present.

BS8485:2015+A1:2019 and CIRIA C665 is the current guidance which gives up-to-date advice on all aspects of ground gas. It outlines good practice in investigation, the collection of relevant data and monitoring programmes in a risk-based approach to gas contaminated land. Two semi-quantitative methods are set out for the assessment of risk:

1 For low rise housing with a ventilated under floor void at minimum 150 mm (Boyle and Witherington);
2 For all other development types (Wilson and Card).

Both methods use the concept of Gas Screening Values (GSVs) to identify levels of risk. The mitigation and management of potentially unacceptable risk is described with reference to both passive and active systems of gas. Source removal is also discussed as an option.

CIRIA C665 and the advice it contains has been prepared to be generally consistent with CLR11 *Model Procedures for the management of land contamination* (Defra and Environment Agency, 2004a). The aim of CIRIA C665 is a consistent approach to decision making, particularly relating to the scope of protective design measures on a site specific basis.

Legislative Framework
CIRIA C665 provides technical guidance however also recognises the context into which the guidance has to be employed. Government policy is based upon a "suitable for use approach", which is relevant to both the current and proposed future use of land. When considering the current use of land, Part IIA of the Environment Protection Act 1990 provides the regulatory regime. The presence of hazardous ground gases could provide the "source" in a "pollutant linkage" which could lead the regulator to determine that considerable harm or there is a significant possibility of such harm being caused. Under such circumstances, the regulator would determine the land to be "contaminated land" under the provisions of the Act, setting out the process of remediation as described in the DETR Circular 02/2000 *Statutory guidance on contaminated land* (DETR, 2000a).

Frequency and Duration of Monitoring
The monitoring period for a specific site covers the "worst case" scenario. A "worst case" scenario will occur during falling atmospheric pressure and, in particular, weather conditions such as rainfall, frost and dry weather.

The benefits of the additional information and whether it is likely to change the scope of gas protection should be considered, as are the consequences of failing to characterise adequately pollutant linkages. Investigations concerned with soil gas are required to provide monitoring data sufficient to allow prediction of worst case conditions enabling the confident assessment of risk and subsequent design of appropriate gas protection schemes. Monitoring programmes should not be an academic exercise in data collection.

Below are matrices that will aid in determining an appropriate number of gas monitoring visits and the length of monitoring period.

Typical/idealised periods of monitoring

		Generation of Potential Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	1 month	2 months	3 months	6 months	12 months
	Moderate (Flats)	2 months	3 months	6 months	12 months	24 months
	High (Residential with Gardens)	3 months	6 months	6 months	12 months	24 months

Typical/idealised frequency of monitoring

		Generation of Potential Source				
		Very Low	Low	Moderate	High	Very High
Sensitivity of Development	Low (Commercial)	4	6	6	12	12
	Moderate (Flats)	6	6	9	12	24
	High (Residential with Gardens)	6	9	12	24	24

Note

1 NHBC guidance also recommends this period of monitoring (Boyle and Witherington, 2007).
2 There is no industry consent over "high", "medium" or "low" generation potential of source.
3 At least two sets of readings should be at low and falling atmospheric pressure (but not restricted to periods below <1000 mb) known as worst case conditions. Historical data can be used as part of the data set (Table 5.5b).

It is recommended that newly installed monitoring wells are left for 24 hours to allow the soil gas to reach equilibrium. It should be recognised, however, that some soil gas regimes could take considerably longer (up to seven days). Interpretation of any initial readings should take this equilibrium process into account.

Contaminated Land Screening Values

In assessing the potential for contamination Brownfield Solutions Limited (BSL) follows UK guidance and current best practice.

General
The current recommended method for assessing contamination is on the basis of:

Source-Pathway-Receptor

Where any one of these "pollution linkages" is absent there is deemed to be no risk.

Fundamentally receptors can be considered as humans and controlled waters (surface and ground waters).

The purpose of using Tier 1 screening levels is to have a simple means of assessing the potential contamination of a site and to inform decisions on whether further investigation is warranted or whether an option to undertake clean up based on the data to hand is cost effective.

Human Health
Current UK guidance is provided by DEFRA and the Environment Agency (EA). Publications forming part of the guidance include; CLEA Model, toxicological reports and soil guideline values (SGV), collectively referred to as the CLEA Guidance. The CLEA Guidance has included a number of publications which have provided initial screening values for soil contamination based on standard land uses and soil assumptions.

CLEA guidance has gone through a number of revisions, all of the original SGV's that were published have been withdrawn and publication of new SGV's commenced in 2009.

For determinands where no SGVs are available, S4UL values have been published using the CLEA 1.06 Model. These are the third set of generic assessment criteria generated by CIEH, and replace the previous two sets of GACs. The revised S4UL values are based on greater knowledge of relevant toxicology and further consideration of exposure frequencies.

No SGV or S4UL is available for lead as this is derived based on blood lead levels. C4SL values for six determinands including lead was published by DEFRA/CL:AIRE in December 2014 and they represent a low risk as opposed to minimal risk. The C4SL values are based on a sandy loam with 6% Soil Organic Matter. These screening values were published by DEFRA for Part 2A use, although with the dual purpose for use under planning. However these have not been officially accepted by Local Government for use under planning. S4ULs remain the first reference due to the broader range of end uses and soil organic content.

The preference from the EA is that site specific screening levels are used wherever possible. Due to numerous factors it is not always possible to utilise site specific values. In these instances the following data sources are used in the order of preference given below:

- CIEH S4UL values (derived by CIEH/LQM)
- DEFRA/CL:AIRE C4SL's
- CL:AIRE GAC values
- Current UK SGV's
- Guidance from other European countries
- Guidance from the outside Europe

Controlled Waters
The European Water Framework Directive (WFD) became UK law in December 2003. It was created to ensure that European countries manage their rivers, groundwater and lakes so that they stay healthy for people and for wildlife.

This is achieved by the use of chemical standards for surface waters and groundwater. These values describe concentrations of chemicals that are not expected to cause harm to environmental organisms or human health, provided they are not exceeded. The same chemical may have several standards for different environmental regimes, and for different protection objectives.

Statutory Standards are set in legislation and if exceeded, this constitutes non-compliance with statutory obligations. European Directives are implemented in England and Wales by corresponding statutory instruments (i.e. regulations). The statutory instruments can be the exact same standards as they appear in the Directive or be more stringent.

A number of non-statutory standards also exist, these are set by various organisations (including the EA) for chemicals that are considered to be of concern, but are not covered by any specific legislation.

The chemical standards used in the UK to control impaction of contamination on controlled waters are Environmental Quality Standards (EQS). The EQS's cover a large number of compounds.

Where certain compounds are not covered by the EQS these are commonly compared to the UK Drinking Water Standards (DWS).

Further Assessment

When screening values are exceeded then further consideration is required. This could include the use of simple measures to break the pollution pathway and mitigate the risk, further more detailed investigation, including the deriving of site specific values to better define the risk and to design appropriate remedial measures.

Source	Contaminant	Unit	Proposed End Use														
			Residential with Homegrown Produce			Residential without Homegrown Produce			Commercial			Public Open Space (POS) resi			Public Open Space (POS) park		
		SOM (%)	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6
LQM S4UL	Arsenic	mg/kg	37	37	37	40	40	40	640	640	640	79	79	79	170	170	170
LQM S4UL	Cadmium	mg/kg	11	11	11	85	85	85	190	190	190	120	120	120	532	532	532
LQM S4UL	Chromium (III)	mg/kg	910	910	910	910	910	910	8600	8600	8600	1500	1500	1500	33000	33000	33000
LQM S4UL	Chromium (VI)	mg/kg	6	6	6	6	6	6	33	33	33	7.7	7.7	7.7	220	220	220
LQM S4UL	Copper	mg/kg	2400	2400	2400	7100	7100	7100	68000	68000	68000	12000	12000	12000	44000	44000	44000
C4SL	Lead	mg/kg	200	200	200	330	330	330	2300	2300	2300	760	760	760	1400	1400	1400
LQM S4UL	Mercury, Elemental	mg/kg	1.2	1.2	1.2	1.2	1.2	1.2	58	58	58	16	16	16	30	30	30
LQM S4UL	Nickel	mg/kg	180	180	180	180	180	180	980	980	980	230	230	230	3400	3400	3400
LQM S4UL	Selenium	mg/kg	250	250	250	430	430	430	12000	12000	12000	1100	1100	1100	1800	1800	1800
LQM S4UL	Zinc	mg/kg	3700	3700	3700	40000	40000	40000	730000	730000	730000	81000	81000	81000	170000	170000	170000
LQM S4UL	Phenol (total)	mg/kg	280	550	1100	750	1300	2300	760	1500	3200	760	1500	3200	760	1500	3200
LQM S4UL	Acenaphthene	mg/kg	210	510	1100	3000	4700	6000	84000	97000	100000	15000	15000	15000	29000	30000	30000
LQM S4UL	Acenaphthylene	mg/kg	170	420	920	2900	4600	6000	83000	97000	100000	15000	15000	15000	29000	30000	30000
LQM S4UL	Anthracene	mg/kg	2400	5400	11000	31000	35000	37000	520000	540000	540000	74000	74000	74000	150000	150000	150000
LQM S4UL	Benz(a)anthracene	mg/kg	7.2	11	13	11	14	15	170	170	180	29	29	29	49	56	62
LQM S4UL	Benzo(a)pyrene	mg/kg	2.2	2.7	3.0	3.2	3.2	3.2	35	35	36	5.7	5.7	5.7	11	12	13
LQM S4UL	Benzo(b)fluoranthene	mg/kg	2.6	3.3	3.7	3.9	4	4	44	44	45	7.1	7.2	7.2	13	15	16
LQM S4UL	Benzo(ghi)perylene	mg/kg	320	340	350	360	360	360	3900	4000	4000	640	640	640	1400	1500	1600
LQM S4UL	Benzo(k)fluoranthene	mg/kg	77	93	100	110	110	110	1200	1200	1200	190	190	190	370	410	440
LQM S4UL	Chrysene	mg/kg	15	22	27	30	31	32	350	350	350	57	57	57	93	110	120
LQM S4UL	Dibenz(a,h)anthracene	mg/kg	0.24	0.28	0.30	0.31	0.32	0.32	3.5	3.6	3.6	0.57	0.57	0.58	1.1	1.3	1.4
LQM S4UL	Fluoranthene	mg/kg	280	560	890	1500	1600	1600	23000	23000	23000	3100	3100	3100	6300	6300	6400
LQM S4UL	Fluorene	mg/kg	170	400	860	2800	3800	4500	63000	68000	71000	9900	9900	9900	20000	20000	20000
LQM S4UL	Indeno(1,2,3,cd)pyrene	mg/kg	27	36	41	45	46	46	500	510	510	82	82	82	150	170	180
LQM S4UL	Naphthalene	mg/kg	2.3	5.6	13	2.3	5.6	13	190	460	1100	4900	4900	4900	1200	1900	3000
LQM S4UL	Phenanthrene	mg/kg	95	220	440	1300	1500	1500	22000	22000	23000	3100	3100	3100	6200	62000	6300
LQM S4UL	Pyrene	mg/kg	620	1200	2000	3700	3800	3800	54000	54000	54000	7400	7400	7400	15000	15000	15000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 5 - 6	mg/kg	42	78	160	42	78	160	3200	5900	12000	570000	590000	600000	95000	130000	180000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 6 - 8	mg/kg	100	230	530	100	230	530	7800	17000	40000	600000	610000	620000	150000	220000	320000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 8 - 10	mg/kg	27	65	150	27	65	150	2000	4800	11000	13000	13000	13000	14000	18000	21000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 10 - 12	mg/kg	130	330	760	130	330	770	9700	23000	47000	13000	13000	13000	21000	23000	24000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 12 - 16	mg/kg	1100	2400	4300	1100	2400	4400	59000	82000	90000	13000	13000	13000	25000	25000	26000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 16 - 35	mg/kg	65000	92000	110000	65000	92000	110000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000
LQM S4UL	Petroleum Hydrocarbons Aliphatic EC 35 - 44	mg/kg	65000	92000	110000	65000	92000	110000	1600000	1700000	1800000	250000	250000	250000	450000	480000	490000
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 5 - 7	mg/kg	70	140	300	370	690	1400	26000	46000	86000	56000	56000	56000	76000	84000	92000
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 7 - 8	mg/kg	130	290	660	860	1800	3900	56000	110000	180000	56000	56000	56000	87000	95000	100000
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 8 - 10	mg/kg	34	83	190	47	110	270	3500	8100	17000	5000	5000	5000	7200	8500	9300
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 10 - 12	mg/kg	74	180	380	250	590	1200	16000	28000	34000	5000	5000	5000	9200	9700	10000
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 12 -16	mg/kg	140	330	660	1800	2300	2500	36000	37000	38000	5100	5100	5000	10000	10000	10000
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 16 - 21	mg/kg	260	540	930	1900	1900	1900	28000	28000	28000	3800	3800	3800	7600	7700	7800
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 21 - 35	mg/kg	1100	1500	1700	1900	1900	1900	28000	28000	28000	3800	3800	3800	7800	7800	7900
LQM S4UL	Petroleum Hydrocarbons Aromatic EC 35 - 44	mg/kg	1100	1500	1700	1900	1900	1900	28200	28200	28200	3800	3800	3800	7800	7800	7900
LQM S4UL	Benzene	mg/kg	0.087	0.17	0.37	0.38	0.7	1.4	27	47	90	72	72	73	90	100	110
LQM S4UL	Toluene	mg/kg	130	290	660	880	1900	3900	56000	110000	180000	56000	56000	56000	87000	95000	100000
LQM S4UL	Ethyl Benzene	mg/kg	47	110	260	83	190	440	5700	13000	27000	24000	24000	25000	17000	22000	27000
LQM S4UL	Xylene - o	mg/kg	60	140	330	88	210	480	6600	15000	33000	41000	42000	43000	17000	24000	33000
LQM S4UL	Xylene - m	mg/kg	59	140	320	82	190	450	6200	14000	31000	41000	42000	43000	17000	24000	32000
LQM S4UL	Xylene - p	mg/kg	56	130	310	79	180	430	5900	14000	30000	41000	42000	43000	17000	23000	31000
CL:AIRE 2010	MTBE (methyl tert-butyl ether)	mg/kg	49	84	160	49	84	160	7900	13000	24000	49	84	160	49	84	160
LQM S4UL	Chloroethene (Vinyl Chloride)	mg/kg	0.00064	0.00087	0.0014	0.00077	0.001	0.0015	0.059	0.077	0.12	3.5	3.5	3.5	4.8	5	5.4
LQM S4UL	1,2-Dichloroethane (1,2-DCA)	mg/kg	0.0071	0.011	0.019	0.0092	0.013	0.023	0.67	0.97	1.7	29	29	29	21	24	28
LQM S4UL	1,1,1-Trichloroethane	mg/kg	8.8	1.8	39	9	18	40	660	1300	3000	14000	14000	14000	57000	76000	100000
LQM S4UL	1,1,2,2-Tetrachloroethane	mg/kg	1.6	3.4	7.5	3.9	8	17	270	550	11000	1400	1400	1400	1800	2100	2300
LQM S4UL	1,1,1,2-Tetrachloroethane	mg/kg	1.2	2.8	6.4	1.5	3.5	8.2	0.79	1.9	4.4	1400	1400	1400	1500	1800	2100
LQM S4UL	Tetrachloroethene (PCE)	mg/kg	0.18	0.39	0.9	0.18	0.4	0.92	19	42	95	1400	1400	1400	810	1100	1500
LQM S4UL	Tetrachloromethane (carbon tetrachloride)	mg/kg	0.026	0.056	0.13	0.026	0.056	0.13	2.9	6.3	14	890	920	950	190	270	400

			Proposed End Use															
Source	Contaminant	Unit	Residential with Homegrown Produce			Residential without Homegrown Produce			Commercial			Public Open Space (POS) resi			Public Open Space (POS) park		
		SOM (%)	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6	1	2.5	6
LQM S4UL	Trichloroethene (TCE)	mg/kg	0.016	0.034	0.075	0.017	0.036	0.08	1.2	2.6	5.7	120	120	120	70	91	120
LQM S4UL	Trichloromethane (chloroform)	mg/kg	0.91	1.7	3.4	1.2	2.1	4.2	99	170	350	2500	2500	2500	2600	2800	3100
LQM S4UL	Chlorobenzene	mg/kg	0.45	1	2.4	0.46	1	2.4	56	130	290	11000	13000	14000	1300	2000	2900
LQM S4UL	1, 2 Dichlorobenzene	mg/kg	23	55	130	24	57	130	2000	4800	11000	90000	95000	98000	24000	26000	51000
LQM S4UL	1, 3 Dichlorobenzene	mg/kg	0.4	1	2.3	0.44	1.1	2.5	30	73	170	300	300	300	390	440	470
LQM S4UL	1, 4 Dichlorobenzene	mg/kg	61	150	350	61	150	340	4400	10000	25000	17000	17000	17000	26000	36000	36000
LQM S4UL	1, 2, 3 Trichlorobenzene	mg/kg	1.5	3.6	8.6	1.5	3.7	8.8	102	250	590	1800	1800	1800	770	1100	1600
LQM S4UL	1, 2, 4 Trichlorobenzene	mg/kg	2.6	6.4	15	2.6	6.4	15	220	530	1300	15000	17000	19000	1700	2600	4000
LQM S4UL	1, 2, 3, 4 Trichlorobenzene	mg/kg	0.33	0.81	1.9	0.33	0.81	1.9	23	55	130	1700	1700	1800	280	580	860
LQM S4UL	1, 2, 3, 4 Tetrachlorobenzene	mg/kg	15	36	78	24	56	120	1700	3080	4400	830	830	830	1500	1600	1600
LQM S4UL	1, 2, 3, 5 Tetrachlorobenzene	mg/kg	0.66	1.6	3.7	0.75	1.9	4.3	49	120	240	78	79	79	110	120	130
LQM S4UL	1, 2, 4, 5 Tetrachlorobenzene	mg/kg	0.33	0.77	1.6	0.73	1.7	3.5	42	72	96	13	13	13	25	26	26
LQM S4UL	Pentachlorobenzene	mg/kg	5.8	12	22	19	30	38	640	770	830	100	100	100	190	190	190
LQM S4UL	Hexachlorobenze	mg/kg	1.8	3.3	4.9	4.1	5.7	6.7	110	120	120	16	16	16	30	30	30

See LQM/CIEH S4ULs for Human Health Risk Assessment document for notes regarding derivation.

Re-Use Of Waste - Guidance Note

Definition of Waste
The Environment Agency considers waste to be *"...any material that is discarded, or intended to be discarded..."* This includes any soil from trenches, footing, site strip etc. It is no longer required in its original location, therefore it is considered to be waste.

CL:AIRE: Code of Practice
Where materials are excavated for construction purposes, wherever possible these should be retained on site for engineering purposes if they are suitable for use. This can be implemented under the CL:AIRE "Development Industry Code of Practice for the Definition of Waste" (CL:AIRE DoWCoP), also commonly referred to as a "Materials Management Plan".

The developer/contractor is advised to complete all works under the DoWCoP.

Potential scenarios where soils may be able to be re-used:

- Material capable of being used in another place on the same site without treatment.
- Material capable of being used in another place on the same site following ex-situ treatment on site.
- Material capable of being used in another development site without treatment (Direct Transfer).
- Material capable of being used in another development site following ex-situ treatment on another site eg Hub site.

The Code of Practice requires 4 No. Factors to be addressed:

1. Protection of human health and protection of the environment.
2. Suitability of use, without further treatment.
3. Certainty of use.
4. Quantity of material.

In order to satisfy these requirements the following are required:

i) Consultation/approval with Local Authority & Environment Agency to confirm they have no objections to the proposed re-use of waste soils, or the risk assessments for the site.
ii) Risk Assessments to demonstrate that the site does not present an Environmental Hazard.
iii) Remediation Strategy for contaminated sites (or Design Statement for non-contaminated sites).
iv) Materials Management Plan (MMP) which details material generated stockpiles and the end use.
v) Volume calculations.
vi) Planning permission for the development.
vii) Contractual details to be clear, regarding who steps in is a contractor goes into administration/liquidation.

The use of the CoP is effectively industry regulated, there is a requirement to appoint an independent Qualified Person (QP) who checks all the requirements have been met and registers the documentation with the Environment Agency. This person must not have had any involvement with the preparing of the risk assessments or remedial strategy on the site.
Soils which require treatment on site (eg bioremediation, stabilisation) will require an Environmental Permit for treatment, together with justification and validation to prove, once treated, this material is suitable for use.
Site management procedures need to be in place to ensure that material is tracked through from excavation stockpiling, treatment and remediation processes. Should the process of material tracking be considered non-robust, or not adhered to, this may fail the test whether excavated materials may be considered non-waste.

Waste Classification For Soils

Introduction

Waste producers have a duty of care to classify the waste they are producing:

- before it is collected, disposed of or recovered.
- to identify the controls that apply to the movement of the waste.
- to complete waste documents and records.
- to identify suitably authorised waste management options.
- to prevent harm to people and the environment.

The most sustainable and economic method of dealing with waste soil is usually the retention and re-use on site. Where this is not possible there are three main options for the disposal of soils:

1. Disposal to a permitted waste recycling facility.
2. Re-use on another site (subject to the suitability).
3. Disposal to a landfill site.

The disposal to a permitted facility will be subject to the **specific conditions of the permits for each individual facility** and will vary dependent on location and environmental sensitivity of the receiving site. Re-use on another site will also be subject to the acceptability criteria of that site.

The guidance below relates to disposal to **landfill sites only**.

Background for Landfill Disposal

In July 2005 the United Kingdom implemented the European Directive 1999/31/EC (The Landfill Directive), this introduced the current regime for waste and waste disposal to landfill. The Landfill Directive places controls on waste disposal. These controls include requirements to follow the waste acceptance procedures and criteria that have been agreed by the Council of the European Union and are laid out in Council Decision 2003/33/EC.

Before a waste can be accepted at a landfill site, the landfill **operator** must be satisfied that the waste meets his permit conditions, the waste acceptance procedures (WAP) and waste acceptance criteria (WAC).

If disposal to landfill is the best management option for the waste soils, these procedures **must** be followed or the operator may refuse to accept the waste.

Key Points

- Not all waste can be landfilled
- Landfills are classified according to whether they can accept **hazardous**, **non-hazardous** or **inert** wastes.
- Wastes can only be accepted at a landfill if they meet the waste acceptance criteria (WAC) for that class of landfill.
- Most wastes must be treated before you can send them to landfill.
- There are formal processes for identifying and checking wastes that must be followed before wastes can be accepted at a landfill site.

Classification

Wastes are listed in the European Waste Catalogue (EWC 2002) and grouped according to generic industry, process or waste types. Wastes within the EWC are either hazardous or non-hazardous. Some of these wastes are hazardous without further assessment (absolute entries) or are 'mirror' entries that require further assessment of their hazardous properties in order to determine whether they are hazardous waste.

Waste soil has mirror entries on the EWC and as such the first phase of the waste classification process is that of determining if the waste is hazardous or not i.e the hazard assessment. The most common EWC waste codes related to soil are:

17 05	**soil (including excavated soil from contaminated sites), stones and dredging spoil**
17 05 03*	soil and stones containing dangerous substances
17 05 04	soil and stones other than those mentioned in 17 05 03

Soils may contain certain contaminants (eg asbestos, oil,) which have prescribed concentration thresholds, that if breached will render the material hazardous waste. These are based on specific "hazardous properties" which include hazards such as carcinogenicity, flammability and toxicity.

In the first instance the concentrations of plausible contaminants within the soil should be identified and wastes should be **classified based on their total concentrations**.

Waste Definitions

Inert	• Will not undergo any significant physical, chemical or biological transformations. • Will not dissolve. • Will not burn. • Will not physically or chemically react. • Will not biodegrade. • Will not adversely affect other matter with which it comes into contact in a way likely to give rise to environmental pollution or harm to human health. • Has insignificant total leachability and pollutant content. • Produces a leachate with an ecotoxicity that is insignificant (if it produces leachate).
Non-Hazardous	Is not inert (see above) Is not hazardous (see below)
Hazardous	Soil has hazardous properties as defined in WM3 (Guidance on the classification and assessment of waste (1st edition 2015)- Technical Guidance)
Stable Non-reactive hazardous waste#	Hazardous waste, the leaching behaviour of which will not change adversely in the long-term, under landfill design conditions or foreseeable accidents either: in the waste alone (for example, by biodegradation), under the impact of long-term ambient conditions (for example, water, air, temperature or mechanical constraints) or by the impact of other wastes (including waste products such as leachate and gas).

This option allows hazardous waste that is stable and thus has a low leaching potential to be deposited in cells with a standard of containment consistent with non-hazardous wastes.

WAC Testing

The purpose of WAC analysis is to confirm that the waste complies with the relevant WAC for the receiving landfill. If the waste has any disposal route other than a landfill site (e.g. recycling facility, incineration etc) the **WAC is not relevant.** Furthermore the WAC limits **cannot be used to make an assessment of whether a waste is hazardous**. WAC testing does however define if a non-hazardous waste is suitable for an inert landfill.

Classification based on Total Concentrations[1]	**Non-Hazardous Waste**		**Hazardous Waste**	
WAC testing	Below inert WAC limit values:	Above inert WAC limit values:	Below hazardous WAC limit values	Above hazardous WAC limit values
Landfill requirements	INERT landfill	NON-HAZARDOUS landfill[2]	HAZARDOUS landfill	PRE-TREATMENT[3]

1 Total concentrations are defined as tests results on solids as opposed to leachate (i.e. a liquid).
2 Individual sites may have certain limit values pre-determined in their licence.
3 After pre-treatment the material characteristics may have changed to an extent that allow the soil to be re-classified.

Hydrocarbons in Soils

WM3 uses the term Oil or Waste Oil to cover hydrocarbons products such as fuel oil, petrol or diesel. These are defined by WM3 as hazardous under an absolute entry in the List of Wastes. However hydrocarbons in soils are a mixture rather than a pure product and are therefore not absolute entries.

Known Oils

The simplest scenario is where the identity of the contaminating oil is known or can be identified. If the oil is known the manufacturer's or supplier's REACH compliant safety data sheet for the specific oil can be obtained and the hazard statement codes on that Safety Data Sheet can be used for the hazardous waste assessment.

Where the identity of the oil can only be identified down to a petroleum group level (i.e. the contaminating oil is known to be diesel, but the specific type/brand is unknown), then the classification of that petroleum group should be used in the assessment. The marker compounds associated with that petroleum group may be used to confirm carcinogenicity.

Oils may contain a range of hydrocarbons, so the presence of for instance Diesel Range Organics (DRO) does not enable the assessor to conclude that diesel is present. These hydrocarbons may have arisen from other oils, the laboratory needs

to provide an interpretation of the chromatograph to determine if it is consistent with diesel or weathered diesel as a whole.

The concentration of known oils should be determined using a method that as a minimum spans the range in which the carbon numbers for that known oil fall.

Unknown Oils

Where hydrocarbons are contaminating soils it is likely that the oil will be unknown or cannot be determined.

WM3 states that:

> For contaminated land specific consideration must be given to the following before proceeding;
>
> - The presence of other organic contaminants, for example solvents or coal tar that could be detected as hydrocarbons. Coal Tar is not an oil and is considered separately in WM3 example 2. Where the site history or investigation indicates the presence of hydrocarbons from oil and other sources (e.g. coal tar), and the origin of the hydrocarbons cannot reliably be assigned to either, then a worst case approach of considering the hydrocarbons both as waste oil (in accordance with this example) and from other sources, for example coal tar should be taken.
> - The presence of diesel, or weathered diesel, should be specifically considered by the laboratory and where this is confirmed by the hydrocarbon profile the oil should be assessed as a known or identified oil (diesel).

The use of **marker compounds** is optional; however it is recommended that where possible the marker compounds should be used. WM3 states:

> If the identity of the oil is unknown, and the petroleum group cannot be established, then the oil contaminating the waste can be classified as non-carcinogenic/mutagenic due to the presence of oil if all three of the following criteria are met:
>
> - The waste contains benzo[a]pyrene (BaP) at a concentration of less than 0.01% (1/10,000th) of the TPH concentration (This is the carcinogenic limit specified in table 3.1 of the CLP for BaP)
> - This has been determined by an appropriate and representative sampling approach in accordance with the principles set out in Appendix D of WM3, and
> - The analysis clearly demonstrates, for example by carbon bands or chromatograph, and the laboratory has reasonably concluded that the hydrocarbons present have not arisen from petrol or diesel.

For example:

TPH Concentration (mg/kg)	Petrol or Diesel	BaP (mg/kg)	Classification
10,000	No	0.9	Non- Hazardous
1,000	No	Not available	Hazardous
1,000	Yes	Not relevant	Hazardous

References

1. Environmental Permitting (England and Wales) Regulations 2010 (as amended) (EP Regulations), the Landfill Directive (1999/31/EC) and the subsequent Council Decisions.
2. Environment Agency Environmental Permitting Regulations: "Inert Waste Guidance- Standards and Measures for the Deposit of Inert Waste on Land" 2009.
3. Environment Agency "Waste acceptance at landfills - Guidance on waste acceptance procedures and criteria" Nov 2010.
4. Environment Agency "Guidance on the classification and assessment of waste (Technical Guidance WM3)".
5. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).
6. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives
7. 2014/955/EU: Commission Decision of 18 December 2014 amending Decision 2000/532/EC on the list of waste pursuant to Directive 2008/98/EC of the European Parliament
8. Environmental Permitting Guidance The Landfill Directive For the Environmental Permitting (England and Wales) Regulations 2010 Updated March 2010 Version 3.1
9. Classification, Labelling and Packaging of Substances Regulation (EC 1272/2008) (CLP).

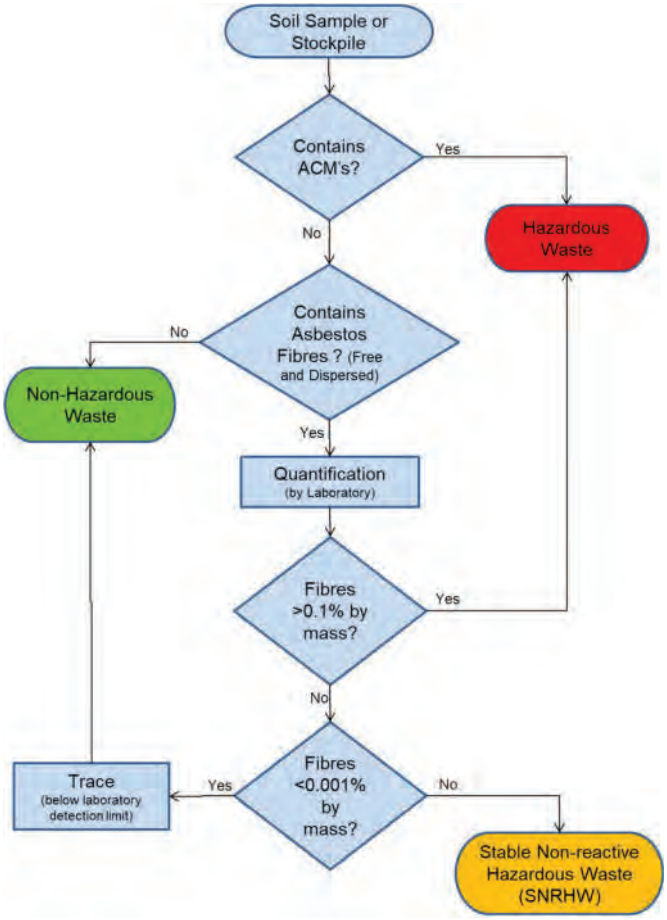
Additional Asbestos Guidance Notes

Disposal

The 1st Edition of WM3 "Guidance on the classification and assessment of waste", details the way in which Asbestos is assessed within soils.

The assessment of asbestos containing waste is dependent on whether the asbestos is present as:

- Fibres that are free and dispersed, or
- Identifiable pieces of asbestos containing materials (ACM's)



Identifiable pieces of asbestos are any particle of a size that can be identified as potentially being asbestos by a competent person if examined by the naked eye. The result is that commonly soils with visible ACM's are sorted and the ACM's removed by hand picking and separate disposal.

Asbestos concentrations below 0.001% by mass are below standard laboratory detection limits and are not currently regarded as containing asbestos for the purposes of disposal and may be disposed of to an inert landfill site[1]. These levels are often termed "trace" by laboratories.

Asbestos concentrations between 0.001% and 0.1% are stable non-reactive hazardous waste (SNRHW)[1]. Waste transfer stations where soil recycling takes place may be able to take SNRHW, but are unlikely to take soils containing asbestos above trace concentrations.

The following codes should be assigned to the asbestos waste as appropriate:

17 06	**Insulation materials and asbestos-containing construction materials**
17 06 01	Insulation materials containing asbestos
17 06 03	Other insulation materials consisting of or containing hazardous substances
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03
17 06 05	Construction material containing asbestos

WM3 indicates that 17 06 05 would normally be used in preference to 17 06 01 for the asbestos in asbestos contaminated soil and stones.

Construction materials containing asbestos and "*other suitable materials*" may be landfilled at landfills for non-hazardous waste in accordance with the Landfill Directive without testing.

This means that wastes that are only hazardous because of their asbestos content can be disposed of at landfills for non-hazardous waste in separate landfill cells that only accept asbestos wastes and other suitable materials. The Landfill Directive requires that stable non-reactive hazardous waste shall not be deposited with biodegradable waste (for example organic material, household waste, paper etc..) and must meet the waste acceptance criteria set out in accordance with Annex II.

Construction

Health and Safety Executive (HSE) guidance on asbestos is not directly related to soil and much of the guidance focuses on the removal of asbestos from buildings. The overarching legislation is the Control of Asbestos Regulation (CAR 2012). However where work involves (or is likely to involve) contact with asbestos then CAR 2012 requires a risk assessment including whether or not the work is licensed or notifiable non-licensed work and may require an Asbestos Management Plan. Work becomes notifiable if it is considered that the control limit could be exceeded.

Brownfield sites frequently have soils that contain asbestos and the presence of asbestos needs to be considered within the context of construction, particularly in relation to groundworks. The exposure of soils and the use of excavators and plant to move soil around increases the possibility of fibres becoming airborne. However it is good site practice to not generate dusts and to employ dust suppression on all sites regardless of the presence of asbestos.

The legal control limit for asbestos is 0.1f/ml over a continuous four hour period. The control limit is not a '*safe*' level and exposure from work activities involving asbestos must be reduced to as far below the control limit as possible.

Clearly the higher the concentrations in the soil the greater potential there is for fibres to be released, however IOM publication TM/88/14 "the release of dispersed asbestos fibres from soil" 1988 concludes that:

- Mixtures of asbestos in dry soils with asbestos content as low as 0.001% can produce airborne respirable asbestos concentrations greater than 0.1f/ml in dust clouds where the respirable dust concentrations are less than 5mg/m^3.
- An action limit is recommended of no higher than 0.001% asbestos in soils above which steps should be taken to minimise exposure to airborne fibres (eg by wetting).
- The addition of relatively small quantities (10%) of water can reduce the airborne fibre concentrations by an order of magnitude.

Where asbestos has been identified at concentrations above 0.001% as free and dispersed fibres in the soil precautions need to be adopted. Concentrations below this are considered to be normal background, although good site practice dictates that the generation of dusts should be avoided and therefore any fugitive fibre release from minor concentrations should be kept to a practical minimum.

End Use

The use of materials containing asbestos and material containing asbestos is prohibited under EU legislation. There is currently a Joint Industry Working Group (JIWG) tasked with producing a Code of Practice for Asbestos in Soil, Made Ground and Construction & Demolition Material that will clarify in due course the position of the various government agencies.

Asbestos containing materials can remain in situ under a suitable cover system which may be hardsurfacing or soft landscaping (with or without hard dig layers and markers).

There is a risk that future maintenance may compromise such systems and details of the presence of asbestos should be kept in the Health and Safety File.

Preliminary publications from JIWG (April 2015) provide guides for decision making in relation to construction. These are at a "Beta" test stage and further publications will be provided in due course.

The re-use of waste soils should be undertaken in accordance with the CL:AIRE Code of Practice and is subject to suitable risk assessments demonstrating low risk . There is nothing that specifically excludes the re-use of soils containing asbestos as fill to raise levels. However the movement of materials increases the risk of fibres becoming airborne and suitable precautions will be required.

The re-use of soils containing asbestos at concentrations above hazardous waste levels is likely to meet with regulatory opposition. Assuming a suitable strategy could be agreed this would take a considerable amount of time and is only likely to be feasible where there is a long program for implementation.

Asbestos in Soil as Free Fibres

Concentration (by weight)	Waste Disposal				Construction Issues	End Use	
	Recycle	Inert	SNR Hazardous	Hazardous		Suitable for re-use on site	Precautions
Not detected	√	√			No precautions necessary, however on a brownfield site asbestos not previously identified may be found during works and a statement within the contractors method statement for how they will deal with this unforeseen asbestos would be good practice to ensure compliance with CAR2012.	Yes	None
Trace (<0.001%)		√ [2]			Precautions are unlikely to be required, however a detailed method statement may be required to ensure compliance with CAR2012. Basic asbestos management good practice will be required. Typically precautions would include: • Ensuring soils do not dry out to become dusty. • Site personnel have the risk communicated at induction stage.	Yes Soils can be re-used under CL:AIRE CoP with the correct precautions in place.	Generally clean cover or hardstanding cover required.
0.001% – 0.099%			√		Contractor needs to produce an Asbestos Management Plan in accordance with CAR2012 as part of their method statement. Typical precautions would include: • Site personnel have the risk communicated at induction stage. • Ensuring personnel have suitable training. • Task monitoring to inform PPE requirements. • Ensuring soils do not dry out to become dusty and that misting is available during groundworks. • Separate stockpiling. • Clean haulage routes.	Possibly Soils may be able to be re-used under CL:AIRE CoP, subject to a satisfactory Risk Assessment and regulatory agreement with the correct precautions in place.	Clean cover or hardstanding cover required.
0.1+%				√	Contractor needs to produce an Asbestos Management Plan in accordance with CAR2012 as part of their method statement. Typical precautions would include: • Site personnel have the risk communicated at induction stage. • Ensuring personnel have suitable training. • Task monitoring to inform PPE requirements. • Site wide and or perimeter monitoring. • Ensuring soils do not dry out to become dusty and that misting is available during groundworks. • Separate stockpiling. • Clean haulage routes. • Decontamination unit	Unlikely [3] Re-use of soils containing asbestos within an earthworks scheme will involve significant engineering and the risk for generating dusts will be significantly increased with repeated handling and compaction.	Clean cover and a hard dig layer. A plan should be in place for future excavations as part of the Health and Safety File.

2 The standard laboratory detection limit is normally 0.001%. Below 0.001% is trace and currently regarded as not containing asbestos for the purposes of disposal off site. However the waste producer has a duty to fully classify the waste and the presence of trace asbestos should be declared. Consequently it is unlikely that a waste treatment site will take this soil and an inert landfill may make a commercial decision to only take it under some circumstances.

3 The re-use of soils containing asbestos at concentrations above hazardous waste is likely to meet with regulatory opposition. Assuming a suitable strategy could be agreed this would take a considerable amount of time and is only likely to be warranted where there a long program for implementation.

APPENDIX B

Exploratory Hole Logs

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP01
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346186E, 406803N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.20m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.40	61.80		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
▼				0.60	61.60		Greyish brown clayey fine to coarse SAND.
	1.00	ES HSV	78kPa				Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	HSV	92kPa				
	2.50	D		2.45	59.75		Very weak light grey MUDSTONE, partially weathered.
	3.00	ES		3.00	59.20		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.60mbgl.
2. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

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Trial Pit Log

No.
TP02
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346175E, 406749N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.40	60.90		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
	0.80	ES					Greyish brown clayey fine to coarse SAND.
	1.00	D HSV	73kPa	0.90	60.40		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	HSV	92kPa				
	2.50	HSV	107kPa				
	2.80	D		2.75	58.55		Very weak light grey MUDSTONE, partially weathered.
				3.30	58.00		End of Trial Pit at 3.30m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.40mbgl.
2. Sides slightly collapsing between 0.45mbgl and 0.90mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP03
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346146E, 406737N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.35	62.15		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
▼	0.80	ES		1.05	61.45		Brownish orange fine to medium SAND.
	1.20	HSV	73kPa				Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	HSV	89kPa				
	2.50	D		2.50	60.00		Very weak light grey MUDSTONE, partially weathered.
				3.00	59.50		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.80mbgl.
2. Sides slightly collapsing between 0.35mbgl and 1.05mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP04
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346166E, 406698N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.30	62.20		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
▼	0.80	ES		1.05	61.45		Brownish orange fine to medium SAND.
	1.50	D HSV	69kPa				Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	HSV	79kPa				
	2.50	D HSV	111kPa				
				2.90	59.60		Very weak light grey MUDSTONE, partially weathered.
				3.30	59.20		End of Trial Pit at 3.30m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.50mbgl.
2. Sides slightly collapsing between 0.30mbgl and 1.05mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP05
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346190E, 406754N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	60.80m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.20	ES					Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
				0.40	60.40		Greyish brown clayey fine to coarse SAND.
	0.80	ES		0.70	60.10		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.00	HSV	73kPa				
	1.50	D					
	2.00	HSV	85kPa				
	2.50	HSV	109kPa				
	2.80	D		2.70	58.10		Very weak light grey MUDSTONE, partially weathered.
				3.30	57.50		End of Trial Pit at 3.30m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.30mbgl.
2. Sides slightly collapsing between 0.40mbgl and 0.70mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP06
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346261E, 406728N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	60.60m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.35	60.25		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
	0.50	ES		0.60	60.00		Greyish brown clayey fine to coarse SAND.
	1.00	HSV	73kPa				Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	HSV	91kPa				
	2.50	D					
	3.00	HSV	108kPa	3.05	57.55		End of Trial Pit at 3.05m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.40mbgl.
2. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP07
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346267E, 406626N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.45	61.85		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
▼	0.80	ES		0.90	61.40		Greyish brown clayey fine to coarse SAND.
	1.00	HSV	73kPa				Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	D HSV	92kPa				
	3.00	HSV	103kPa	3.30	59.00		End of Trial Pit at 3.30m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.50mbgl.
2. Sides slightly collapsing between 0.45mbgl and 0.90mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

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Trial Pit Log

No.
TP08
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346276E, 406650N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.60m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES		0.35	62.25		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
▼	0.60	ES					Greyish brown clayey fine to coarse SAND.
	1.00	HSV	79kPa	1.10	61.50		
	1.50	D					Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	HSV	88kPa				
	2.50	D					
	3.00	HSV	109kPa	3.00	59.60		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.50mbgl.
2. Sides readily collapsing between 0.35mbgl and 1.10mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP09
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346342E, 406676N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.40m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
TP	
Scale	
1:25	
Logged	**Checked**
JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.20	ES					Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.50	ES		0.45	60.95		Orangish brown clayey fine to coarse SAND
	1.50	D HSV	71kPa	1.40	60.00		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	HSV	111kPa				
	2.50	D					
	3.00	HSV	120kPa				
				3.40	58.00		End of Trial Pit at 3.40m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.30mbgl.
2. Sides readily collapsing between 0.45mbgl and 1.40mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP10
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346316E, 406634N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.40	61.90		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.80	ES					Orangish brown clayey fine to coarse SAND.
	1.50	D HSV	72kPa	1.40	60.90		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	100kPa				
	3.00	HSV	120kPa				
				3.40	58.90		End of Trial Pit at 3.40m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.20mbgl.
2. Sides readily collapsing between 0.40mbgl and 1.40mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP11
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346288E, 406585N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.90m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
				0.00	62.90		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
▼	0.30	ES		0.40	62.50		Brown clayey fine to coarse SAND.
	0.80	ES					
	1.20	D HSV	67kPa	1.10	61.80		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	128kPa				
	3.00	HSV	130kPa				
				3.50	59.40		End of Trial Pit at 3.50m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.40mbgl.
2. Sides slightly collapsing between 0.40mbgl and 1.10mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP11A
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346322E, 406578N	**Hole Type**	TP
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	63.50m OD	**Scale**	1:25
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20	**Logged** / **Checked**	JM / JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.30	ES		0.40	63.10		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.50	ES					Brown clayey fine to coarse SAND.
	1.20	D HSV	75kPa	1.10	62.40		Firm to stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	99kPa				
	3.00	HSV	127kPa				
	3.50	HSV	130kPa	3.50	60.00		End of Trial Pit at 3.50m

1.0
2.0
3.0
4.0
5.0

Remarks

1. No groundwater encountered.
2. Sides slightly collapsing between 0.40mbgl and 1.10mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP12
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346339E, 406526N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	63.10m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.35	62.75		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.50	ES					Orangish brown clayey fine to coarse SAND.
	1.00	HSV	84kPa	0.95	62.15		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.20	D					
	2.00	D HSV	123kPa				
	3.00	HSV	130kPa				
				3.10	60.00		End of Trial Pit at 3.10m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.20mbgl.
2. Sides slightly collapsing between 0.35mbgl and 0.95mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP12A
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346337E, 406506N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	63.00m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.40	62.60		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.80	ES					Greyish brown clayey fine to coarse SAND.
	1.50	D HSV	65kPa	1.30	61.70		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	91kPa				
	3.00	HSV	107kPa	3.05	59.95		End of Trial Pit at 3.05m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.20mbgl.
2. Sides slightly collapsing between 0.40mbgl and 1.30mbgl.
3. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP13
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346333E, 406593N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.20m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.20	ES					MADE GROUND: Grass over dark brown clayey fine to coarse sand topsoil with rootlets.
				0.40	61.80		MADE GROUND: Greyish brown slightly gravelly clayey fine to coarse sand. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
	0.80	ES					*Railway sleeper (timber) at 0.80mbgl with a faint hydrocarbon odour.*
				0.85	61.35		Greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
	1.00	HSV	74kPa	1.00	61.20		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D					
	2.00	D HSV	96kPa				
	2.80	HSV	120kPa				
				2.90	59.30		End of Trial Pit at 2.90m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.30mbgl.
2. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP14
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346370E, 406624N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.60m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.45	61.15		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	1.00	ES					Greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
	1.30	HSV	71kPa	1.25	60.35		
	1.50	D					Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	HSV	120kPa				
	2.50	D					
	3.00	HSV	130kPa	3.00	58.60		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.20mbgl.
2. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TP15
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346388E, 406643N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.20	ES		0.30	61.00		Grass over dark brown clayey fine to coarse SAND with rootlets (TOPSOIL).
	0.80	ES					Greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
	1.20	HSV	64kPa	1.20	60.10		
	1.50	D					Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	73kPa				
	3.00	HSV	127kPa	3.00	58.30		End of Trial Pit at 3.00m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.30mbgl.
2. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TT01
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346174E, 406820N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.20m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.30	ES		0.35	61.85		Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
	0.80	ES					Greyish brown clayey fine to coarse SAND.
	1.50	D HSV	79kPa	1.05	61.15		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.50	D		2.20	60.00		Very weak light grey MUDSTONE partially weathered, recovered as a gravelly clay with medium cobble content.
				4.20	58.00		End of Trial Pit at 4.20m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.20mbgl.
2. Sides readily collapsing between 0.35mbgl and 1.05mbgl.
3. Trench excavated in attempt to locate coal seam. Dimensions 7.00m by 0.80m.
4. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TT02
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346142E, 406811N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.80m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
▼	0.20	ES					Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
				0.40	61.40		Greyish brown clayey fine to coarse SAND.
	1.00	ES		1.05	60.75		Firm to stiff brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	1.50	D HSV	75kPa				
				2.00	59.80		Very weak light grey MUDSTONE partially weathered, recovered as a gravelly clay with medium cobble content.
	2.50	D					
				4.15	57.65		End of Trial Pit at 4.15m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.30mbgl.
2. Sides readily collapsing between 0.40mbgl and 1.05mbgl.
3. Trench excavated in attempt to locate coal seam. Dimensions 8.00m by 0.80m.
4. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TT03
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346293E, 406775N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.20	ES					Grass over dark brown slightly gravelly slightly clayey fine to coarse SAND with rootlets. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
				0.35	61.15		
▼	0.50	ES					Greyish brown clayey fine to coarse SAND.
	1.00	HSV	66kPa	0.95	60.55		Firm brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
	2.00	D HSV	94kPa				*Becoming stiff from 2.00mbgl.*
	2.50	D					
	3.00	HSV	99kPa				
	4.00	HSV	125kPa				
				4.95	56.55		End of Trial Pit at 4.95m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.60mbgl.
2. Sides readily collapsing between 0.35mbgl and 0.95mbgl.
3. Trench excavated in attempt to locate coal seam. Dimensions 10.20m by 0.80m.
4. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TT04
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346260E, 406700N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.70m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	JM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES					Grass over dark brown slightly gravelly slightly clayey SAND with rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone (TOPSOIL).
				0.35	61.35		
▼	0.50	ES					Greyish brown clayey fine to coarse SAND.
				0.55	61.15		
	1.00	HSV	90kPa				Firm brown slightly sandy gravelly CLAY. Sand is fine to coarse. Gravel is subangular fine to coarse of sandstone and mudstone.
							Becoming stiff from 1.00mbgl.
	2.00	D HSV	122kPa				
	3.00	HSV	122kPa				
	4.00	HSV	130kPa				
	4.65	D		4.65	57.05		Black COAL.
				4.85	56.85		End of Trial Pit at 4.85m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater ingress at 0.55mbgl.
2. Sides readily collapsing between 0.35mbgl and 0.55mbgl.
3. Trench excavated in attempt to locate coal seam. Dimensions 10.30m by 0.80m.
4. Coal seam encountered at base of trial trench with an outcrop length of 1.0m, dipping towards the south-east. Thickness not proven due to reach of plant equipment. Bedrock outcropping east and west of the seam comprised extremely weak to very weak light grey mudstone partially weathered.
5. Backfilled with arisings upon completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Trial Pit Log

No.
TT05
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346211E, 406658N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	60.29m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20

Hole Type	Scale	Logged	Checked
TP	1:25	TM	JMC

Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
	Depth (m)	Type	Results				
	0.10	ES					Black fine to medium SAND with rootlets. (TOPSOIL)
				0.25	60.04		
							Orange fine to medium SAND.
	0.60	ES					
▼				0.85	59.44		
							Soft to firm light grey sandy CLAY. Sand is fine to medium.
	1.00	D HSV	46kPa				*Becoming firm from 1.00mbgl.*
							Becoming brown and slightly gravelly from 1.40mbgl. Gravel is subangular to subrounded fine to coarse of mudstone.
	2.00	D HSV	102kPa				*Becoming stiff from 2.00mbgl.*
	3.40	D		3.40	56.89		
				3.50	56.79		Black COAL.
							End of Trial Pit at 3.50m

1.0
2.0
3.0
4.0
5.0

Remarks

1. Groundwater encountered with medium flow at 0.80mbgl.
2. Sides readily collapsing between 0.40mbgl and 1.50mbgl.
3. Coal seam encountered at base of trial trench with an outcrop length of 1.0m, dipping towards the south-east. Bedrock outcropping east and west of the seam comprised extremely weak to very weak light grey partially weathered mudstone.
4. Unable to excavate deeper than 3.50mbgl due to large collapse of trench sides and reach of JCB-3CX.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS01
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346168E, 406793N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20 - 16/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼	0.20	ES					Black brown clayey fine to medium SAND with rootlets. (TOPSOIL).
		0.50	ES		0.40	61.90		Reddish brown fine to medium SAND.
		1.00	ES		0.70	61.60		Soft light grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone.
		1.20	SPT	N=5 (1,1/1,1,1,2)				
		2.00	SPT	N=24 (2,3/4,5,7,8)				*Becoming stiff from 2.00mbgl.*
		2.40	D					
		2.50	SPT	N≥50 (25 for 30mm/50 for 10mm)	2.50 2.54	59.80 59.76		Very weak light grey MUDSTONE, partially weathered. End of Borehole at 2.54m

1.0
2.0
3.0
4.0
5.0
6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with medium flow at 0.20mbgl.
3. Casing installed from GL to 2.00mbgl.
4. Borehole installed: GL to 0.50m plain, 0.50m to 2.50m slotted, 2.50m to 2.54m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS02
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346184E, 406740N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.40m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES		0.30	61.10		Black brown clayey fine to medium SAND with rootlets. (TOPSOIL).
					0.50	60.90		Reddish brown fine to medium SAND.
		0.60	ES					Soft light grey slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of mudstone and sandstone.
		1.20	D SPT	N=4 (1,1/1,1,1,1)				*Becoming reddish brown from 1.20mbgl.*
								Becoming firm from 1.70mbgl.
		2.00	SPT	N=12 (1,2/3,3,3,3)				
		2.20	D		2.25	59.15		Extremely weak light grey MUDSTONE, partially weathered.
		3.00	SPT	N=14 (8,7/4,3,3,4)				
		3.70	D					
		4.00	SPT	N≥50 (9,14/50 for 200mm)				
					4.35	57.05		End of Borehole at 4.35m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.20mbgl.
3. Casing installed from GL to 2.00mbgl.
4. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS03
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346264E, 406697N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.00m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES		0.35	61.65		Black brown clayey fine to coarse SAND with rootlets. (TOPSOIL).
		0.50	ES					Light brown slightly gravelly fine to coarse SAND. Gravel is subrounded fine to medium of mudstone.
		1.20	ES SPT	N=5 (1,1/1,1,1,2)	1.00	61.00		Soft light grey brown slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. *Becoming reddish brown from 1.20mbgl.* *Becoming firm from 1.50mbgl.*
		2.00-2.45 2.00	D SPT	N=7 (1,1/1,2,2,2)				
		3.00-3.45 3.00	D SPT	N=9 (1,2/2,2,2,3)				
		4.00	SPT	N=16 (2,3/3,4,4,5)				*Becoming stiff from 4.00mbgl.*
					4.45	57.55		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl.
3. Casing installed from GL to 2.00mbgl.
4. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS04
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346269E, 406781N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.41m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES					MADE GROUND: Black slightly gravelly fine to coarse sand topsoil with low cobble content. Gravel is angular to subrounded fine to coarse of brick, mudstone, sandstone and coal. Cobbles are angular to subangular up to 80mm in diameter of brick.
					0.50	61.91		Reddish brown fine to medium SAND.
					0.70	61.71		Soft light grey slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of mudstone and sandstone.
		1.20-1.65	D					
		1.20	SPT	N=7 (1,1/1,2,2,2)				
								Becoming brown from 1.40mbgl.
								Becoming firm from 1.60mbgl.
		2.00	SPT	N=12 (1,2/3,3,3,3)				
		2.80	D					
		3.00	SPT	N=7 (1,1/1,2,2,2)				
		3.20	D					
		4.00	SPT	N≥50 (3,3/50 for 220mm)				
					4.20	58.21		Extremely weak light grey MUDSTONE, partially weathered.
					4.37	58.04		End of Borehole at 4.37m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.20mbgl.
3. Casing installed from GL to 2.00mbgl.
4. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS05
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346235E, 406654N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	59.59m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.30	ES					Black clayey fine to medium SAND. (TOPSOIL)
					0.50	59.09		
	▼	0.70	ES					Reddish brown fine to medium SAND.
		1.20	SPT	N=7 (1,1/1,2,2,2)	1.20	58.39		
		1.40	ES					Soft light orangish grey slightly gravelly slightly sandy CLAY. Sand is fine to medium. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. Occasional wood fragments.
		2.00	SPT	N=6 (1,1/1,1,2,2)				
		2.50	D					
		3.00	SPT	N=15 (2,3/3,4,4,4)				*Becoming stiff from 3.00mbgl.*
		4.00-4.45	D		4.00	55.59		Extremely weak light grey MUDSTONE, partially weathered.
		4.00	SPT	N=14 (2,2/3,3,4,4)				
					4.45	55.14		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.80mbgl, rising to 0.45mbgl after 20 minutes.
3. Casing installed from GL to 2.00mbgl.
4. Borehole installed: GL to 1.00m plain, 1.00m to 3.00m slotted, 3.00m to 4.45m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS06
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346350E, 406637N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.60m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES					Black-brown very sandy CLAY with roots and rootlets. Sand is fine to coarse. (TOPSOIL).
		0.80	ES		0.70	60.90		Brown fine to medium SAND.
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Loose from 1.20mbgl.*
		1.80	D		1.70	59.90		Firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone.
		2.00	SPT	N=12 (1,1/2,3,3,4)				
		3.00	SPT	N=21 (3,3/4,5,6,6)	3.00	58.60		
		3.20	D		3.10	58.50		Brown fine to medium SAND.
		4.00	SPT	N=23 (4,4/5,5,6,7)				Stiff brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone.
					4.45	57.15		End of Borehole at 4.45m

1.0
2.0
3.0
4.0
5.0
6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.50mbgl.
3. Running sands encountered between 0.70mbgl and 1.70mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Borehole installed: GL to 1.00m plain, 1.00m to 4.00m slotted, 4.00m to 4.45m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS07
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346308E, 406396N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.94m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.30	ES					MADE GROUND: Black-brown slightly gravelly very sandy clay topsoil. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of brick and mudstone.
		0.80	ES		0.70	61.24		Light brown fine to coarse SAND.
		1.20	SPT	N=8 (0,1/2,2,2,2)				*Loose from 1.20mbgl.*
		1.80	D		1.75	60.19		Brown clayey peaty fine to coarse SAND with natural organic odour.
		2.00	SPT	N=9 (2,2/2,3,2,2)	1.85	60.09		Soft to firm light grey-brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		2.50	D					*Becoming brown from 2.00mbgl.*
		3.00	SPT	N=16 (2,3/3,4,4,5)	2.90	59.04		Medium dense brown fine to medium SAND.
					3.40	58.54		Firm brown slightly sandy CLAY. Sand is fine to coarse.
					3.45	58.49		Brown fine to medium SAND.
		4.00	SPT	N=21 (3,4/5,5,5,6)	3.90	58.04		Stiff brown slightly sandy CLAY. Sand is fine to coarse.
					4.45	57.49		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl.
3. Running sands encountered between 0.70mbgl and 1.75mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS08
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346296E, 406422N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.84m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.10	ES					MADE GROUND: Black brown slightly gravelly clayey fine to medium sand topsoil with roots and rootlets. Gravel is angular to subangular fine to coarse of mudstone and glass.
		0.50	ES		0.40	61.44		Light brown fine to medium SAND.
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Sand becoming dark brown from 0.85mbgl.*
		1.90	ES		1.80	60.04		*Loose from 1.20mbgl.*
		2.00	SPT	N=4 (0,0/1,1,1,1)				Very soft to soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone.
		2.70	D					*Becoming firm from 2.60mbgl*
		3.00	SPT	N=21 (2,2/4,5,6,6)				*Becoming firm to stiff from 3.00mbgl.*
		3.80	D					
		4.00	SPT	N=13 (2,2/2,3,4,4)				
					4.45	57.40		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.10mbgl.
3. Running sands encountered between 0.40mbgl and 1.80mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS09
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346333E, 406343N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.51m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	17/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	SM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	D		0.30	61.21		MADE GROUND: Grass over dark brown slightly gravelly slightly sandy clay topsoil with rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone, sandstone, brick, plastic and rare glass.
		0.40	D ES					
					0.60	60.91		Dark grey slightly gravelly SAND. Sand is fine to coarse. Gravel is fine to coarse subangular to subrounded of brick and mudstone.
		0.70	D ES					Light brown fine to medium SAND.
	▼							*Becoming brown from 0.80mbgl.*
		1.00	D ES					
		1.20	SPT	N=4 (0,1/1,1,1,1)				*Loose from 1.20mbgl.*
					1.55	59.96		
		1.60	D ES		1.65	59.86		Plastic dark brown fibrous PEAT. Organic odour.
		1.80	D ES					Soft mottled grey and brown silty CLAY.
		2.00	SPT	N=10 (1,1/2,2,3,3)				*Becoming firm from 1.90mbgl.*
		2.50	D					*Becoming stiff from 2.50mbgl.*
		3.00	SPT	N=25 (2,3/6,6,6,7)				
		3.20	D					
		4.00	SPT	N=27 (5,5/5,7,7,8)				
					4.45	57.06		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 1.00mbgl.
3. Running sands encountered between 0.60mbgl and 1.55mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Borehole installed: GL to 1.00m plain, 1.00m to 4.00m slotted, 4.00m to 4.45m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS10
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346365E, 406393N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.31m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	17/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	SM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.35	61.96		MADE GROUND: Grass over black slightly gravelly sandy clay topsoil with rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone, occasional concrete, glass and plastic.
		0.50	D ES					Light brown fine to coarse SAND.
	▼	0.90	D ES					*Becoming brown from 0.80mbgl.*
		1.00	D ES					
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Loose from 1.20mbgl.*
					1.50	60.81		Soft brown slightly gravelly silty CLAY. Gravel is fine to medium sub-rounded to angular of mudstone and sandstone.
		1.80	D ES					
		2.00	SPT	N=6 (0,0/1,1,2,2)				
		2.60	D					*Becoming firm from 2.50mbgl*
		3.00	SPT	N=15 (2,2/3,4,4,4)				*Becoming stiff from 2.80mbgl.*
		3.50	D					
		4.00	SPT	N=18 (3,3/4,4,5,5)				
					4.45	57.86		End of Borehole at 4.45m

1.0
2.0
3.0
4.0
5.0
6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.90mbgl.
3. Running sands encountered between 0.35mbgl and 1.50mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS11
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346290E, 406478N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.92m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼				0.30	61.62		Very soft dark brown-black slightly gravelly very sandy CLAY with roots and rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. (TOPSOIL)
		0.50	ES					Reddish brown-grey fine to medium SAND.
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Loose from 1.20mbgl.*
		1.40	D					
		2.00	SPT	N=5 (0,0/1,1,1,2)	1.95	59.97		
					2.00	59.92		Brown clayey peaty SAND with natural organic odour.
								Very soft slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
					2.45	59.47		Soft slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
		2.90	D					
		3.00	SPT	N=14 (1,2/3,4,3,4)				*Becoming firm from 3.00mbgl.*
					3.45	58.47		Brown fine to medium SAND.
					3.90	58.02		Firm to stiff slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
		4.00	SPT	N=16 (2,2/3,4,4,5)				
					4.45	57.47		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl.
3. Running sands encountered between 0.30mbgl and 1.95mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS12
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346271E, 406415N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.28m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES		0.55	61.73		MADE GROUND: Grass over black slightly gravelly clayey sand topsoil with rootlets and low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of brick, concrete and glass. Cobbles are subangular up to 80mm in diameter of brick and concrete.
		0.90	ES					Light brown fine to coarse SAND.
		1.20	SPT	N=6 (0,1/1,1,2,2)				*Becoming brown from 1.00mbgl.*
		2.00	SPT	N=6 (1,1/1,1,2,2)	2.10	60.18		*Loose from 1.20mbgl.*
		2.10-2.45	D					*Becoming light grey from 1.50mbgl.*
		2.20	ES					Soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		3.00	SPT	N=16 (2,3/3,4,4,5)	3.00	59.28		*Becoming firm from 2.80mbgl.*
					3.15	59.13		Brown fine to coarse SAND.
					3.45	58.83		Firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		4.00	SPT	N=17 (2,2/3,4,5,5)	3.90	58.38		Brown fine to coarse SAND.
					4.45	57.83		Firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
								End of Borehole at 4.45m

1.0
2.0
3.0
4.0
5.0
6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.55mbgl. Groundwater level in inspection pit rose from 1.00mbgl to 0.50mbgl in ten minutes.
3. Running sands encountered between 0.55mbgl and 2.10mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS13
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346223E, 406421N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.55m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES					MADE GROUND: Grass over very soft black slightly gravelly slightly sandy clay topsoil with roots and rootlets. Sand is fine to coarse. Gravel is subangular fine of brick.
		0.50	ES		0.40	62.15		Light grey fine to medium SAND.
								Becoming light brown from 0.70mbgl.
		1.20	D SPT	N=2 (0,0/0,0,1,1)				*Very loose from 1.20mbgl.*
					1.80	60.75		Brown clayey peaty SAND with natural organic odour.
		1.90	D		1.85	60.70		Soft to firm light grey-brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		2.00	SPT	N=5 (0,1/1,1,1,2)				
		2.90	D					
		3.00	SPT	N=10 (2,2/2,2,3,3)				*Becoming firm from 3.00mbgl.*
		4.00	SPT	N=14 (2,2/3,3,4,4)				
					4.45	58.10		End of Borehole at 4.45m

1.0
2.0
3.0
4.0
5.0
6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with medium flow at 0.20mbgl.
3. Running sands encountered between 0.40mbgl and 1.80mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS14
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346248E, 406410N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.58m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	
WS	
Scale	
1:30	
Logged	**Checked**
TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.40	ES					MADE GROUND: Grass over soft dark brown-black slightly gravelly very sandy clay topsoil. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of brick and concrete. *Isolated angular cobble of concrete at 0.10mbgl, 100mm in diameter.*
		0.80	ES		0.70	61.88		Dark brown slightly gravelly clayey fine to medium SAND with occasional rootlets.
		1.20	SPT	N=3 (0,0/0,1,1,1)				*Very loose from 1.20mbgl.*
		1.80	D					*Becoming light brown from 1.70mbgl.*
		2.00	SPT	N=4 (0,0/1,1,1,1)	2.05	60.53		Soft to firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		2.50	D					
		3.00	SPT	N=17 (2,3/3,4,5,5)	3.00	59.58		Medium dense brown fine to medium SAND.
		3.80	D		3.70	58.88		Soft to firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		4.00	SPT	N=14 (2,3/3,3,4,4)	4.00	58.58		Brown fine to medium SAND.
					4.20	58.38		Firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
					4.45	58.13		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl. Groundwater level in inspection pit rose from 1.20mbgl to 0.30mbgl in ten minutes.
3. Running sands encountered between 0.70mbgl and 2.05mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS15
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346242E, 406386N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.64m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	62.54		MADE GROUND: Red cobbles of angular whole bricks 150mm in diameter.
		0.20	ES					MADE GROUND: Black slightly gravelly clayey fine to coarse sand. Gravel is angular to subrounded fine to coarse of brick, glass and concrete.
	▼				0.45	62.19		Light grey brown fine to medium SAND with mild hydrocarbon odour.
		0.60	ES					
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Loose from 1.20mbgl.*
								Becoming reddish brown from 1.30mbgl.
					1.90	60.74		
		1.95	D					Brown clayey peaty SAND with natural organic odour.
		2.00	SPT	N=6 (1,1/1,1,2,2)	2.00	60.64		Soft to firm brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		2.20	D					
		3.00	SPT	N=17 (2,2/3,4,5,5)				*Becoming stiff from 3.00mbgl.*
		3.60	D					
		4.00	SPT	N=17 (2,3/4,4,4,5)				
					4.45	58.19		End of Borehole at 4.45m

1.0
2.0
3.0
4.0
5.0
6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.50mbgl. Groundwater level in inspection pit rose from 1.20mbgl to 0.50mbgl in five minutes.
3. Running sands encountered between 0.45mbgl and 1.90mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Borehole installed: GL to 0.50m plain, 0.50m to 2.00m slotted, 2.00m to 4.45m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS16
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346240E, 406363N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.77m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					0.10	62.67		MADE GROUND: Grass over black gravelly fine to coarse sand topsoil. Gravel is subangular to subrounded fine to coarse of mudstone.
		0.30	ES		0.20	62.57		MADE GROUND: Red cobbles of angular whole bricks 150mm in diameter.
					0.70	62.07		MADE GROUND: Black brown slightly gravelly clayey fine to coarse sand. Gravel is subangular to subrounded fine of mudstone and brick.
		0.80	ES					Light brown fine to medium SAND with mild hydrocarbon odour.
	▼							*Becoming reddish brown from 0.8mbgl.*
		1.20-1.65	D					*Loose from 1.20mbgl.*
		1.20	SPT	N=8 (1,1/1,2,2,3)				
					1.80	60.97		Soft light brown grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
		1.90	D					
		2.00	SPT	N=6 (0,1/1,1,2,2)				
		3.00-3.45	D					*Becoming firm from 3.00mbgl.*
		3.00	SPT	N=13 (2,3/3,3,3,4)				
		4.00	SPT	N=19 (2,3/4,4,5,6)				*Becoming stiff from 4.00mbgl.*
					4.40	58.37		Brown fine to medium clayey SAND.
					4.45	58.32		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 1.10mbgl.
3. Running sands encountered between 0.70mbgl and 1.80mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS17
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346246E, 406432N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES		0.30	62.00		Very soft dark brown-black slightly gravelly very sandy CLAY with roots and rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. (TOPSOIL)
		0.60	ES					Light grey fine to medium SAND.
								Becoming orangish brown from 0.90mbgl.
		1.20	SPT	N=4 (0,0/1,1,1,1)				*Loose from 1.20mbgl.*
		1.60	D					
		2.00	SPT	N=7 (1,1/1,2,2,2)				
					2.50	59.80		
		2.60	D					Soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
		3.00	SPT	N=10 (1,2/2,2,3,3)				
					3.20	59.10		Brown fine to medium SAND.
		3.50	SPT	N=13 (2,3/4,3,3,3)				*Medium dense from 3.50mbgl.*
					3.85	58.45		Soft brown slightly sandy CLAY. Sand is fine to coarse.
					3.95	58.35		End of Borehole at 3.95m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with medium flow at 0.20mbgl. Groundwater level in inspection pit rose from 1.00mbgl to 0.50mbgl after five minutes.
3. Running sands encountered between 0.30mbgl and 2.50mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Borehole unable to be progressed beyond 3.95mbgl due to blowing sands.
6. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS18
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346263E, 406466N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.31m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	15/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.30	ES					Black slightly gravelly very sandy CLAY with rootlets and roots up to 20mm in diameter. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
	▼	0.50	ES		0.45	61.86		Brown fine to medium SAND.
		1.20	SPT	N=3 (0,0/0,1,1,1)				*Very loose from 1.20mbgl.*
					1.70	60.61		Brown clayey peaty SAND with natural organic odour.
					1.80	60.51		Soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and rare coal.
		2.00	SPT	N=7 (1,1/1,2,2,2)				*Becoming stiff from 2.00mbgl.*
		2.10	D					
								Becoming firm from 2.70mbgl.
		3.00	SPT	N=17 (2,2/3,4,5,5)				
		3.60	D					
		4.00	SPT	N=22 (3,4/4,5,6,7)				
					4.45	57.86		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.45mbgl. Groundwater level in inspection pit rose from 1.00mbgl to 0.60mbgl in fifteen minutes.
3. Running sands encountered between 0.45mbgl and 1.90mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Borehole installed: GL to 0.50m plain, 0.50m to 2.00m slotted, 2.00m to 4.45m backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS19
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346321E, 406462N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.66m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	TM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES					Black-brown clayey fine to medium SAND with rootlets. (TOPSOIL)
		0.60	ES		0.50	61.16		Brown fine to medium SAND.
		1.20	SPT	N=3 (0,0/0,1,1,1)				*Very loose from 1.20mbgl.*
		1.60	D		1.45	60.20		Soft brown slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone.
		2.00	SPT	N=3 (0,0/0,1,1,1)				*Becoming very soft from 2.00mbgl.*
								Locally soft between 2.60mbgl and 3.00mbgl.
		3.00	SPT	N=16 (2,2/3,3,5,5)				*Becoming stiff from 3.00mbgl.*
		3.10	D					
		4.00	SPT	N=21 (3,3/4,5,6,6)				
					4.45	57.20		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl.
3. Running sands encountered between 0.50mbgl and 1.45mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS20
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346344E, 406416N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.61m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	17/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	SM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Dark brown slightly sandy clay topsoil with rootlets. Sand is fine to medium.
	▼	0.30	D ES					
					0.50	61.11		
		0.55	D ES		0.60	61.01		Dark grey sandy CLAY. Sand is fine to medium. (TOPSOIL)
		0.80	D ES					Grey brown fine to medium SAND.
		1.20	SPT	N=5 (0,0/1,1,1,2)				*Loose from 1.20mbgl.*
		1.50	D		1.50	60.11		
					1.52	60.09		Plastic brown slightly sandy PEAT. Sand is fine to medium. Organic odour.
	▼	2.00	SPT	N=5 (1,2/2,1,1,1)	2.00	59.61		Grey brown fine to medium SAND.
								Loose brown fine to medium SAND.
		2.50	D					
					2.60	59.01		Brown sandy CLAY. Sand is fine to medium.
		2.80	D ES					
	▼	3.00	SPT	N=14 (1,2/3,3,4,4)	3.00	58.61		Medium dense brown fine to medium SAND.
		4.00	SPT	N=14 (2,2/3,3,4,4)				
					4.45	57.16		End of Borehole at 4.45m

1.0 2.0 3.0 4.0 5.0 6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.40mbgl, 2.00mbgl and between 3.00m to 3.50mbgl.
3. Running sands encountered between 0.60mbgl and 1.50mbgl.
4. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Window Sampler No.
WS21
Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346333E, 406396N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.80m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	17/01/20

Hole Type	Scale	Logged	Checked
WS	1:30	SM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	D ES		0.35	61.44		MADE GROUND: Grass over dark brown slightly sandy clay topsoil with rootlets. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse of mudstone, flag stone, brick and plastic. *Flagging encoutered at 0.20mbgl.*
					0.60	61.20		MADE GROUND: Dark red brown clayey gravel. Gravel is medium to coarse sub-angular to subrounded of brick. Light brown fine to medium SAND.
		0.80	D ES		0.90	60.90		Brown fine to medium SAND.
		1.20	D ES SPT	N=3 (0,0/0,1,1,1)				*Very loose from 1.20mbgl.*
		2.00	SPT	N=5 (1,1/1,1,1,2)	2.10	59.70		Soft brown slightly sandy silty CLAY. Sand is fine to medium.
		2.60	D ES					
		3.00	SPT	N=11 (1,2/2,3,3,3)	3.00	58.80		Medium dense brown fine to medium SAND.
					3.45	58.34		End of Borehole at 3.45m

1.0
2.0
3.0
4.0
5.0
6.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress with small flow at 0.30mbgl.
3. Flagstones encountered at 0.20mbgl and former brick road encountered between 0.35m to 0.60mbgl.
4. Running sands encountered between 0.60mbgl and 2.10mbgl.
5. Casing installed from GL to 2.00mbgl.
5. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO01

Sheet 1 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346228E, 406748N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.80m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 14/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.35	61.45		Dark reddish brown clayey SAND with frequent roots and rootlets. Sand is fine to coarse. (TOPSOIL)
					1.20	60.60		Soft to firm light grey slightly sandy CLAY. Sand is fine to medium. Drift.
					4.00	57.80		Light grey MUDSTONE.

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.10mbgl.
3. Casing installed through superficial deposits to 4.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO01

Sheet 2 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346228E, 406748N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.80m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 14/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					23.50	38.30		Black COAL (INTACT).
					23.90	37.90		Grey MUDSTONE.
					25.00	36.80		End of Borehole at 25.00m

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.10mbgl.
3. Casing installed through superficial deposits to 4.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO02

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346168E, 406778N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 15/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼	0.10	ES		0.40	61.10		Black brown clayey fine to medium SAND with rootlets. (TOPSOIL).
					1.20	60.30		Soft light grey slightly gravelly slightly sandy CLAY. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. Drift with clay bands.
					3.50	58.00		Grey sandy MUDSTONE.
					4.50	57.00		Black MUDSTONE.
					5.00	56.50		Grey sandy MUDSTONE.
					6.30	55.20		Hard SANDSTONE.
					7.50	54.00		Grey sandy MUDSTONE.
					9.00	52.50		Light grey SANDSTONE.
					12.80	48.70		Orange brown SANDSTONE.
					14.50	47.00		Black COAL (INTACT).
					15.20	46.30		Grey MUDSTONE.
					20.00	41.50		End of Borehole at 20.00m

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.10mbgl.
3. Casing installed through superficial deposits to 4.00mbgl.
4. No loss of water flush during drilling.
5. Borehole installed: GL to 10.00m plain, 10.00m to 14.00m slotted, 14.00m to 20.00m backfilled with bentonite.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO03

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346137E, 406718N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 15/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.20	ES		0.30	62.20		Dark brown fine SAND. (TOPSOIL)
	▼	0.40	ES		0.60	61.90		Dark brown grey fine to medium SAND.
		0.80	ES		1.20	61.30		Orange fine to medium SAND.
								Drift with clay bands.
					4.00	58.50		Grey MUDSTONE.
					6.20	56.30		Black MUDSTONE.
					6.80	55.70		Grey sandy MUDSTONE.
					11.00	51.50		Light grey SANDSTONE.
					14.00	48.50		Black COAL (INTACT).
					14.70	47.80		Grey MUDSTONE.
					20.00	42.50		End of Borehole at 20.00m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.55mbgl.
3. Casing installed through superficial deposits to 4.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO04

Sheet 1 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346292E, 406694N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.20m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 16/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼	0.30	ES		0.60	61.60		MADE GROUND: Dark brown slightly gravelly clayey sand topsoil with low cobble content. Sand is fine to coarse. Gravel is subangular to subrounded fine to coarse of brick, concrete, mudstone and coal. Cobbles are subangular to subrounded up to 70mm in diameter of concrete.
		0.80	ES		1.20	61.00		Black brown clayey fine to medium SAND. Drift. SAND and CLAY.
					7.50	54.70		Grey MUDSTONE.
					12.30	49.90		Black COAL (INTACT).
					13.10	49.10		Grey MUDSTONE.
					18.60	43.60		Dark grey sandy MUDSTONE.

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.70mbgl.
3. Casing installed through superficial deposits to 8.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO04

Sheet 2 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346292E, 406694N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.20m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 16/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
					21.00	41.20		Grey MUDSTONE.
					28.00	34.20		Hard SILTSTONE.
					31.60	30.60		Light grey SANDSTONE.
					34.00	28.20		Black COAL (INTACT).
					34.60	27.60		Grey SANDSTONE.
					40.00	22.20		End of Borehole at 40.00m

21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.70mbgl.
3. Casing installed through superficial deposits to 8.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO05

Sheet 1 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346218E, 406663N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	60.03m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 17/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼	0.10	ES		0.30	59.73		Black slightly gravelly fine to coarse SAND. Gravel is subangular to subrounded fine to medium of mudstone and coal. (TOPSOIL)
		0.60	ES					Reddish brown fine to medium SAND.
					1.20	58.83		Drift. SAND and CLAY.
					3.90	56.13		Grey MUDSTONE.
					5.50	54.53		Black COAL (INTACT).
					6.20	53.83		Grey MUDSTONE.
					9.50	50.53		Grey SANDSTONE.
					13.50	46.53		Grey MUDSTONE.
					18.00	42.03		Hard SANDSTONE.

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.35mbgl.
3. Casing installed through superficial deposits to 4.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO05

Sheet 2 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346218E, 406663N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	60.03m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 17/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					21.60	38.43		Grey MUDSTONE.
					27.00	33.03		Orange brown MUDSTONE.
					28.30	31.73		Black COAL (INTACT).
					29.00	31.03		Grey MUDSTONE.
					36.60	23.43		Grey sandy MUDSTONE.
					40.00	20.03		End of Borehole at 40.00m

21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.35mbgl.
3. Casing installed through superficial deposits to 4.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO06

Sheet 1 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346254E, 406637N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.40m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 16/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.30	ES		0.60	61.80		Dark brown very sandy CLAY. Sand is fine to medium. (TOPSOIL)
		0.70	ES		1.20	61.20		Orange brown fine to medium SAND.
					5.00	57.40		Drift. SAND and CLAY.
					11.10	51.30		Grey MUDSTONE.
					12.10	50.30		Black COAL (INTACT).
					19.80	42.60		Grey MUDSTONE.

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.70mbgl, rising to 0.35mbgl after 5 minutes.
3. Casing installed through superficial deposits to 6.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO06

Sheet 2 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346254E, 406637N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	62.40m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 16/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
								Dark grey black MUDSTONE.
					21.00	41.40		Grey SANDSTONE.
					29.20	33.20		Hard SILTSTONE.
					34.00	28.40		Black COAL (INTACT).
					34.70	27.70		Grey SANDSTONE.
					40.00	22.40		End of Borehole at 40.00m

21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.70mbgl, rising to 0.35mbgl after 5 minutes.
3. Casing installed through superficial deposits to 6.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO07

Sheet 1 of 1

PROJECT NO:	C4380	**CO-ORDS:**	346336E, 406658N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.30m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 16/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	JM	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.30	ES		0.45	60.85		Grass over dark brown clayey SAND with rootlets. Sand is fine to coarse (TOPSOIL).
					1.20	60.10		Greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone.
								End of Borehole at 1.20m

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress at 0.30mbgl rising to 0.10mbgl after 20 minutes.
3. Borehole relocated to RO07A due to boggy ground conditions surrounding RO07.
4. Backfilled with arisings.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO07A

Sheet 1 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346350E, 406664N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼	0.30	ES		0.45	61.05		Black brown very sandy CLAY with roots and rootlets. Sand is fine to medium. (TOPSOIL)
		0.70	ES					Brown fine to medium SAND.
					1.20	60.30		Drift. SAND and CLAY.
					9.30	52.20		Grey sandy MUDSTONE.
					15.00	46.50		Grey MUDSTONE.
					19.20	42.30		Black COAL (INTACT).
					20.00	41.50		

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress at 0.45mbgl.
3. No loss of water flush during drilling.
4. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO07A

Sheet 2 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346350E, 406664N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	16/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
								Grey MUDSTONE.
					22.30	39.20		Hard grey SILTSTONE.
					25.00	36.50		Grey SANDSTONE.
					27.50	34.00		Dark grey SILTSTONE.
					30.00	31.50		End of Borehole at 30.00m

21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services.
2. Groundwater ingress at 0.45mbgl.
3. No loss of water flush during drilling.
4. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

Borehole Log

PROJECT NO:	C4380	**CO-ORDS:**	346278E, 406605N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.24m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 16/01/20

Rotary Open Hole Borehole No.	
RO08	
Sheet 1 of 2	
Hole Type	
RO	
Scale	
1:100	
Logged	**Checked**
DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
		0.20	ES		0.35	60.88		Grass over black brown slightly gravelly fine to coarse SAND with occasional rootlets. Gravel is subangular to rounded fine to medium of mudstone and coal. (TOPSOIL)
	▼	0.50	ES		1.20	60.04		Light brown fine to medium SAND. *Sand becoming brown from 0.90mbgl.*
								Drift. SAND and CLAY.
					6.50	54.74		Grey MUDSTONE.
					16.00	45.24		Broken ground. 100% flush loss.
					17.30	43.94		Firm drilling. No flush return to log cuttings.

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.80mbgl.
3. Casing installed through superficial deposits to 8.00mbgl.
4. Complete loss of water flush from 16.00mbgl to 30.00mbgl.
5. Borehole installed: GL to 16.00m plain, 16.00m to 18.00m slotted, 18.00m to 30.00m backfilled with bentonite.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO08

Sheet 2 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346278E, 406605N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.24m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 16/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					30.00	31.24		End of Borehole at 30.00m

21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.80mbgl.
3. Casing installed through superficial deposits to 8.00mbgl.
4. Complete loss of water flush from 16.00mbgl to 30.00mbgl.
5. Borehole installed: GL to 16.00m plain, 16.00m to 18.00m slotted, 18.00m to 30.00m backfilled with bentonite.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO09

Sheet 1 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346331E, 406453N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.65m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 20/01/20

Hole Type: RO

Scale: 1:100

Logged: DRILLER **Checked:** JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
		0.10 0.40	ES ES		0.15	61.50		Black clayey fine to medium SAND. (TOPSOIL) Reddish brown and grey fine to medium SAND.
					1.20	60.45		Drift. SAND and CLAY.
					10.60	51.05		SAND and MUDSTONE with traces of coal.
					11.00	50.65		Grey MUDSTONE.
					15.50	46.15		Grey sandy MUDSTONE.

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.20mbgl.
3. Casing installed through superficial deposits to 12.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO09

Sheet 2 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346331E, 406453N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.65m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 20/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					21.40	40.25		Grey MUDSTONE.
					23.50	38.15		Black COAL (INTACT).
					24.10	37.55		Grey MUDSTONE.
					27.00	34.65		Grey sandy MUDSTONE.
					30.00	31.65		End of Borehole at 30.00m

21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.20mbgl.
3. Casing installed through superficial deposits to 12.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO10

Sheet 1 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346383E, 406624N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 16/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing			Depth (m)	Level (m OD)	Legend	Stratum Description
		Depth (m)	Type	Results				
	▼	0.20	ES		0.40	61.10		Grass over dark brown clayey SAND with rootlets. Sand is fine to coarse (TOPSOIL).
					1.20	60.30		Greyish brown slightly gravelly clayey fine to coarse SAND. Gravel is subangular to subrounded fine to coarse of mudstone and sandstone. Drift. CLAY bands.
								Coal recovered in superficial deposits between 9.00mbgl and 10.00mbgl.
					10.00	51.50		Grey sandy MUDSTONE.
					19.50	42.00		Light grey SANDSTONE.

1.0 2.0 3.0 4.0 5.0 6.0 7.0 8.0 9.0 10.0 11.0 12.0 13.0 14.0 15.0 16.0 17.0 18.0 19.0 20.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.35mbgl rising to 0.10mbgl after 20 minutes.
3. Casing installed through superficial deposits to 10.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

Borehole Log

Rotary Open Hole Borehole No.

RO10

Sheet 2 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346383E, 406624N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.50m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	13/01/20 - 16/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
					24.00	37.50		Black COAL (INTACT).
					24.80	36.70		Grey SANDSTONE
					28.00	33.50		Hard light grey SANDSTONE.
					30.00	31.50		End of Borehole at 30.00m

21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress at 0.35mbgl rising to 0.10mbgl after 20 minutes.
3. Casing installed through superficial deposits to 10.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO11

Sheet 1 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346295E, 406486N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.95m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20 - 20/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
	▼				0.40	61.55		Very soft dark brown-black slightly gravelly sandy CLAY with roots and rootlets. Sand is fine to coarse. Gravel is subangular to subrounded fine to medium of mudstone and sandstone. (TOPSOIL)
					1.20	60.75		Reddish brown-grey fine to medium SAND. Drift. SAND and CLAY.
					9.80	52.15		Grey sandy MUDSTONE.
					15.00	46.95		Grey MUDSTONE.
					16.50	45.45		Black COAL (INTACT).
					17.00	44.95		Orange brown MUDSTONE.
					19.90	42.05		

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress with small flow at 0.40mbgl.
3. Casing installed through superficial deposits to 10.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

BROWNFIELD SOLUTIONS LTD

Borehole Log

Rotary Open Hole Borehole No.

RO11

Sheet 2 of 2

PROJECT NO:	C4380	**CO-ORDS:**	346295E, 406486N
PROJECT NAME:	LATHOM PASTURES (PHASE 2)	**LEVEL:**	61.95m OD
CLIENT:	BELLWAY HOMES LIMITED (NORTH WEST)	**DATES:**	14/01/20 - 20/01/20

Hole Type	Scale	Logged	Checked
RO	1:100	DRILLER	JMC

Well	Water Strikes	Sample and In Situ Testing: Depth (m)	Type	Results	Depth (m)	Level (m OD)	Legend	Stratum Description
								Grey MUDSTONE.
					22.00	39.95		Grey SANDSTONE.
					25.80	36.15		Grey MUDSTONE.
					30.00	31.95		End of Borehole at 30.00m

21.0 22.0 23.0 24.0 25.0 26.0 27.0 28.0 29.0 30.0 31.0 32.0 33.0 34.0 35.0 36.0 37.0 38.0 39.0 40.0

Remarks

1. Hand dug pit excavated to 1.20mbgl to check for buried services (logged by engineer).
2. Groundwater ingress with small flow at 0.40mbgl.
3. Casing installed through superficial deposits to 10.00mbgl.
4. No loss of water flush during drilling.
5. Backfilled with cement on completion.

ES = Environmental Sample
D = Disturbed Sample
B = Bulk Sample
LB = Large Bulk Sample
U = Undisturbed Sample
UT = Undisturbed Thin Wall Sample
SPT = Standard Penetration Test
PID = Photoionization Detector (ppm)
PPM = Part Per Million
HSV = Hand Shear Vane

APPENDIX C

Chemical Testing Results

Tim Mayall
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Analytical Report Number : 20-82370

Replaces Analytical Report Number : 20-82370, issue no. 1

Project / Site name:	Neverstich Road, Skelmersdale	**Samples received on:**	21/01/2020
Your job number:	C4380	**Samples instructed on:**	21/01/2020
Your order number:	C4380-622-JM	**Analysis completed by:**	05/02/2020
Report Issue Number:	2	**Report issued on:**	06/02/2020
Samples Analysed:	14 soil samples		

Signed:

Rachel Bradley

Deputy Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-82370

Project / Site name: Neverstich Road, Skelmersdale
Your Order No: C4380-622-JM

Lab Sample Number				1418583	1418584	1418585	1418586	1418587
Sample Reference				TP13	TT04	TP04	TP01	TP12A
Sample Number				ES	ES	ES	ES	ES
Depth (m)				0.80	0.50	1.00	1.00	0.80
Date Sampled				16/01/2020	13/01/2020	12/01/2020	12/01/2020	12/01/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	24	21	13	13	14
Total mass of sample received	kg	0.001	NONE	1.2	1.0	1.5	0.87	1.5
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	-	-	Not-detected	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.4	7.7	5.9	8.4	7.0
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	26	28	13	49	110
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.013	0.014	0.0067	0.024	0.053
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	13.0	13.8	6.7	24.4	52.7
Organic Matter	%	0.1	MCERTS	4.0	2.0	0.5	0.7	0.4
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.7	0.27	< 0.05	< 0.05	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.25	< 0.05	< 0.05	< 0.05	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	2.2	0.49	< 0.05	< 0.05	< 0.05
Pyrene	mg/kg	0.05	MCERTS	1.6	0.50	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.79	0.25	< 0.05	< 0.05	< 0.05
Chrysene	mg/kg	0.05	MCERTS	0.99	0.19	< 0.05	< 0.05	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.95	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.29	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.66	< 0.05	< 0.05	< 0.05	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.33	< 0.05	< 0.05	< 0.05	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.33	< 0.05	< 0.05	< 0.05	< 0.05
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	10.1	1.70	< 0.80	< 0.80	< 0.80
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.9	11	< 1.0	3.0	< 1.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	12	13	4.8	36	4.2
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	12	14	5.0	36	4.3
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	31	1.2	21	3.5
Lead (aqua regia extractable)	mg/kg	1	MCERTS	58	54	1.1	8.7	5.4
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	16	1.9	36	3.6
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	190	54	7.4	46	12
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Toluene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
o-xylene	µg/kg	1	MCERTS	< 1.0	-	-	-	-
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	-	-	-

Analytical Report Number: 20-82370

Project / Site name: Neverstich Road, Skelmersdale
Your Order No: C4380-622-JM

Lab Sample Number				1418583	1418584	1418585	1418586	1418587
Sample Reference				TP13	TT04	TP04	TP01	TP12A
Sample Number				ES	ES	ES	ES	ES
Depth (m)				0.80	0.50	1.00	1.00	0.80
Date Sampled				16/01/2020	13/01/2020	12/01/2020	12/01/2020	12/01/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	-	-	-	-
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	-	-	-	-
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	-	-	-	-
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	-	-	-	-
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	-	-	-	-
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	25	-	-	-	-
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	44	-	-	-	-
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	69	-	-	-	-

Analytical Report Number: 20-82370

Project / Site name: Neverstich Road, Skelmersdale
Your Order No: C4380-622-JM

Lab Sample Number				1418588	1418589	1418590	1418591	1418592
Sample Reference				TP07	WS09	WS05	WS15	WS16
Sample Number				ES	ES	ES	ES	ES
Depth (m)				0.30	0.20	0.30	0.60	0.30
Date Sampled				14/01/2020	17/01/2020	14/01/2020	15/01/2020	15/01/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	24	36	32	17	24
Total mass of sample received	kg	0.001	NONE	1.1	1.2	1.1	1.5	1.1
Asbestos in Soil	Type	N/A	ISO 17025	-	-	Not-detected	-	-
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.3	7.0	7.1	7.7	-
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	24	43	35	19	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.012	0.021	0.017	0.0094	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	11.8	21.4	17.4	9.4	-
Organic Matter	%	0.1	MCERTS	3.7	3.4	5.9	0.5	-
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.29	< 0.05	< 0.05	-
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	-
Fluorene	mg/kg	0.05	MCERTS	< 0.05	0.25	< 0.05	< 0.05	-
Phenanthrene	mg/kg	0.05	MCERTS	0.42	2.9	0.35	< 0.05	-
Anthracene	mg/kg	0.05	MCERTS	< 0.05	0.65	< 0.05	< 0.05	-
Fluoranthene	mg/kg	0.05	MCERTS	0.96	4.7	0.65	< 0.05	-
Pyrene	mg/kg	0.05	MCERTS	0.85	4.0	0.57	< 0.05	-
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.48	2.5	0.33	< 0.05	-
Chrysene	mg/kg	0.05	MCERTS	0.40	1.9	0.27	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.36	2.1	0.38	< 0.05	-
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.25	0.96	0.12	< 0.05	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.37	2.1	0.26	< 0.05	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.20	0.81	< 0.05	< 0.05	-
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.24	< 0.05	< 0.05	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.23	0.84	< 0.05	< 0.05	-
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.52	24.1	2.93	< 0.80	-
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	21	10	< 1.0	-
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.5	0.8	1.8	< 0.2	-
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	-
Chromium (III)	mg/kg	1	NONE	15	18	9.2	2.3	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	15	19	9.4	2.4	-
Copper (aqua regia extractable)	mg/kg	1	MCERTS	66	99	41	4.5	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110	290	63	16	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.7	0.6	< 0.3	-
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	30	13	1.8	-
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	-
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	390	99	11	-
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0

Analytical Report Number: 20-82370

Project / Site name: Neverstich Road, Skelmersdale
Your Order No: C4380-622-JM

Lab Sample Number				1418588	1418589	1418590	1418591	1418592
Sample Reference				TP07	WS09	WS05	WS15	WS16
Sample Number				ES	ES	ES	ES	ES
Depth (m)				0.30	0.20	0.30	0.60	0.30
Date Sampled				14/01/2020	17/01/2020	14/01/2020	15/01/2020	15/01/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	< 10	14
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	< 10	33
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	< 10	47

Analytical Report Number: 20-82370

Project / Site name: Neverstich Road, Skelmersdale
Your Order No: C4380-622-JM

Lab Sample Number				1418593	1418594	1418595	1418596	
Sample Reference				WS14	WS07	WS19	WS04	
Sample Number				ES	ES	ES	ES	
Depth (m)				0.40	0.30	0.20	0.20	
Date Sampled				15/01/2020	16/01/2020	16/01/2020	14/01/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	27	32	30	19	
Total mass of sample received	kg	0.001	NONE	1.2	1.2	0.90	1.1	
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	-	-	
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.5	5.2	6.9	
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	43	140	81	54	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.021	0.072	0.041	0.027	
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	21.4	71.7	40.7	26.9	
Organic Matter	%	0.1	MCERTS	2.7	5.3	2.9	2.3	
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	0.53	1.4	0.98	0.30	
Anthracene	mg/kg	0.05	MCERTS	0.10	0.57	0.26	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	0.98	3.4	2.2	0.62	
Pyrene	mg/kg	0.05	MCERTS	0.87	3.1	1.8	0.60	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.48	1.7	1.2	0.33	
Chrysene	mg/kg	0.05	MCERTS	0.39	1.5	0.84	0.27	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.38	1.7	0.93	0.33	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.21	0.68	0.41	0.14	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.32	1.4	0.77	0.27	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.21	0.67	0.30	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.22	0.75	0.34	< 0.05	
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	4.69	16.8	9.95	2.86	
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	19	17	13	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.4	0.6	1.4	< 0.2	
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	
Chromium (III)	mg/kg	1	NONE	13	17	12	14	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	18	12	14	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	51	68	55	57	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	130	190	130	88	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.7	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	16	28	21	18	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	130	280	230	99	
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	-	-	-	-	
Toluene	µg/kg	1	MCERTS	-	-	-	-	
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	-	
p & m-xylene	µg/kg	1	MCERTS	-	-	-	-	
o-xylene	µg/kg	1	MCERTS	-	-	-	-	
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	-	

Analytical Report Number: 20-82370

Project / Site name: Neverstich Road, Skelmersdale
Your Order No: C4380-622-JM

Lab Sample Number				1418593	1418594	1418595	1418596	
Sample Reference				WS14	WS07	WS19	WS04	
Sample Number				ES	ES	ES	ES	
Depth (m)				0.40	0.30	0.20	0.20	
Date Sampled				15/01/2020	16/01/2020	16/01/2020	14/01/2020	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Petroleum Hydrocarbons								
TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	-	-	-	-	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	-	-	-	-	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	-	-	-	-	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	-	-	-	-	

Analytical Report Number : 20-82370

Project / Site name: Neverstich Road, Skelmersdale

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1418583	TP13	ES	0.80	Brown loam and clay with gravel and vegetation.
1418584	TT04	ES	0.50	Brown loam and clay with gravel and vegetation.
1418585	TP04	ES	1.00	Brown loam and clay with gravel.
1418586	TP01	ES	1.00	Brown loam and clay with gravel.
1418587	TP12A	ES	0.80	Brown loam and clay with gravel and vegetation.
1418588	TP07	ES	0.30	Brown loam and clay with gravel.
1418589	WS09	ES	0.20	Brown loam and clay with gravel and vegetation.
1418590	WS05	ES	0.30	Brown loam and clay with gravel.
1418591	WS15	ES	0.60	Brown loam and clay with gravel.
1418592	WS16	ES	0.30	Brown loam and clay with gravel and vegetation.
1418593	WS14	ES	0.40	Brown loam and clay with gravel and vegetation.
1418594	WS07	ES	0.30	Brown loam and clay with gravel and vegetation.
1418595	WS19	ES	0.20	Brown loam and clay with gravel and vegetation.
1418596	WS04	ES	0.20	Brown loam and clay with gravel.

Analytical Report Number : 20-82370

Project / Site name: Neverstich Road, Skelmersdale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

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Analytical Report Number : 20-82796

Project / Site name:	Neverstich Road, Skelmersdale	**Samples received on:**	23/01/2020
Your job number:	C4380	**Samples instructed on:**	23/01/2020
Your order number:	C4380-622-JM	**Analysis completed by:**	30/01/2020
Report Issue Number:	1	**Report issued on:**	30/01/2020
Samples Analysed:	1 soil sample		

Signed:

Rachel Bradley

Deputy Quality Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-82796

Project / Site name: Neverstich Road, Skelmersdale
Your Order No: C4380-622-JM

Lab Sample Number				1420846				
Sample Reference				RO03				
Sample Number				None Supplied				
Depth (m)				0.20				
Date Sampled				14/01/2020				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	11				
Total mass of sample received	kg	0.001	NONE	1.0				
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected				
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	6.9				
Water Soluble Sulphate as SO_4 16hr extraction (2:1)	mg/kg	2.5	MCERTS	33				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.016				
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	mg/l	1.25	MCERTS	16.4				
Organic Matter	%	0.1	MCERTS	9.1				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Pyrene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Chrysene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05				
Total PAH								
Speciated Total EPA-16 PAHs	mg/kg	0.8	MCERTS	< 0.80				
Heavy Metals / Metalloids								
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.2				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	9.2				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	9.5				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	59				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.8				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	8.6				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	33				

Analytical Report Number : 20-82796

Project / Site name: Neverstich Road, Skelmersdale

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1420846	RO03	None Supplied	0.20	Brown loam and sand with gravel and vegetation.

Analytical Report Number : 20-82796

Project / Site name: Neverstich Road, Skelmersdale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In house method.	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDIX D

Geotechnical Testing Results

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

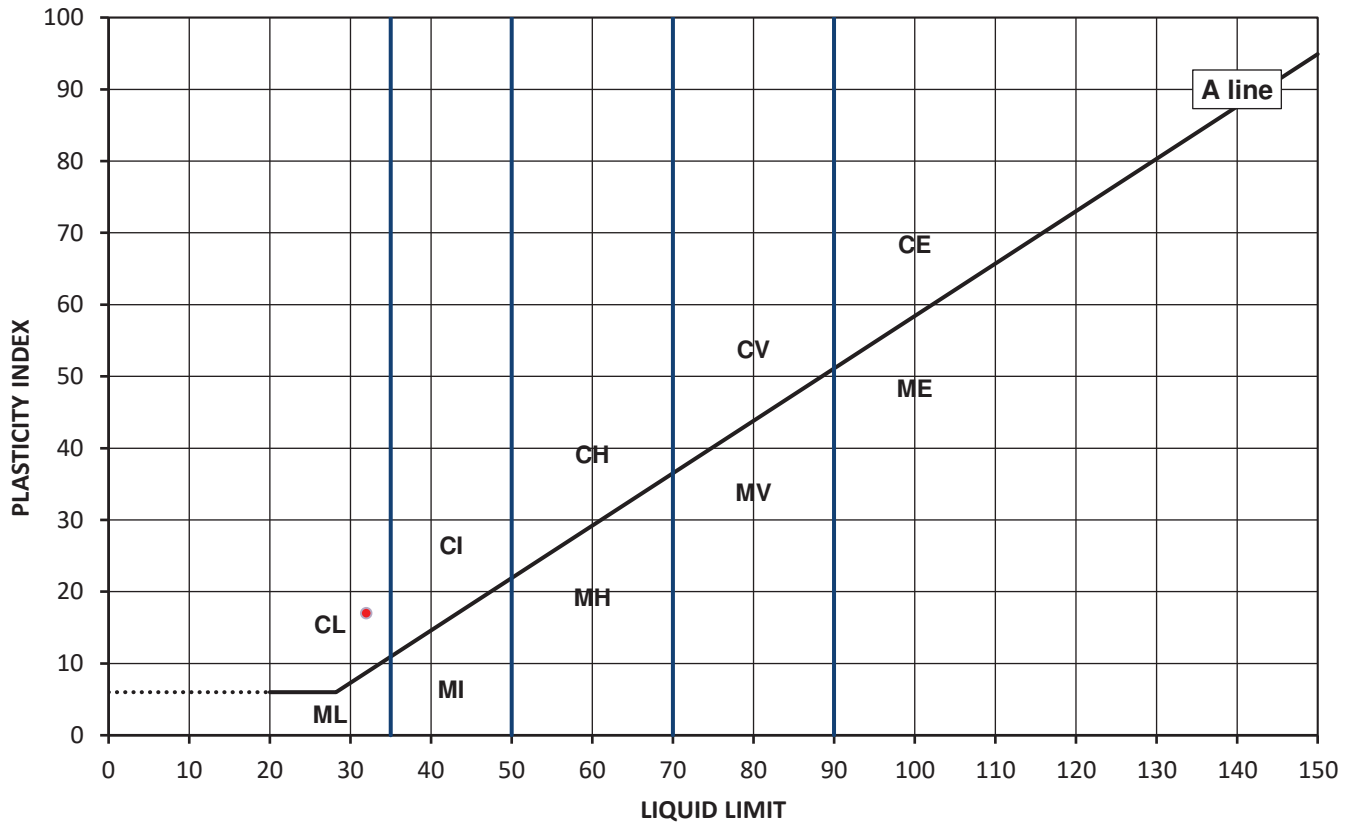
Client:	Brownfield Solutions Ltd	Client Reference:	C4380
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	20-82443
		Date Sampled:	Not Given
		Date Received:	21/01/2020
Contact:	Tim Mayall	Date Tested:	28/01/2020
Site Address:	Everstich Road, Skelmersdale	Sampled By:	JM/TM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1418946	Depth Top [m]:	1.50
Hole No.:	TP08	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
17	32	15	17	92



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 05/02/2020

GF 232.6

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

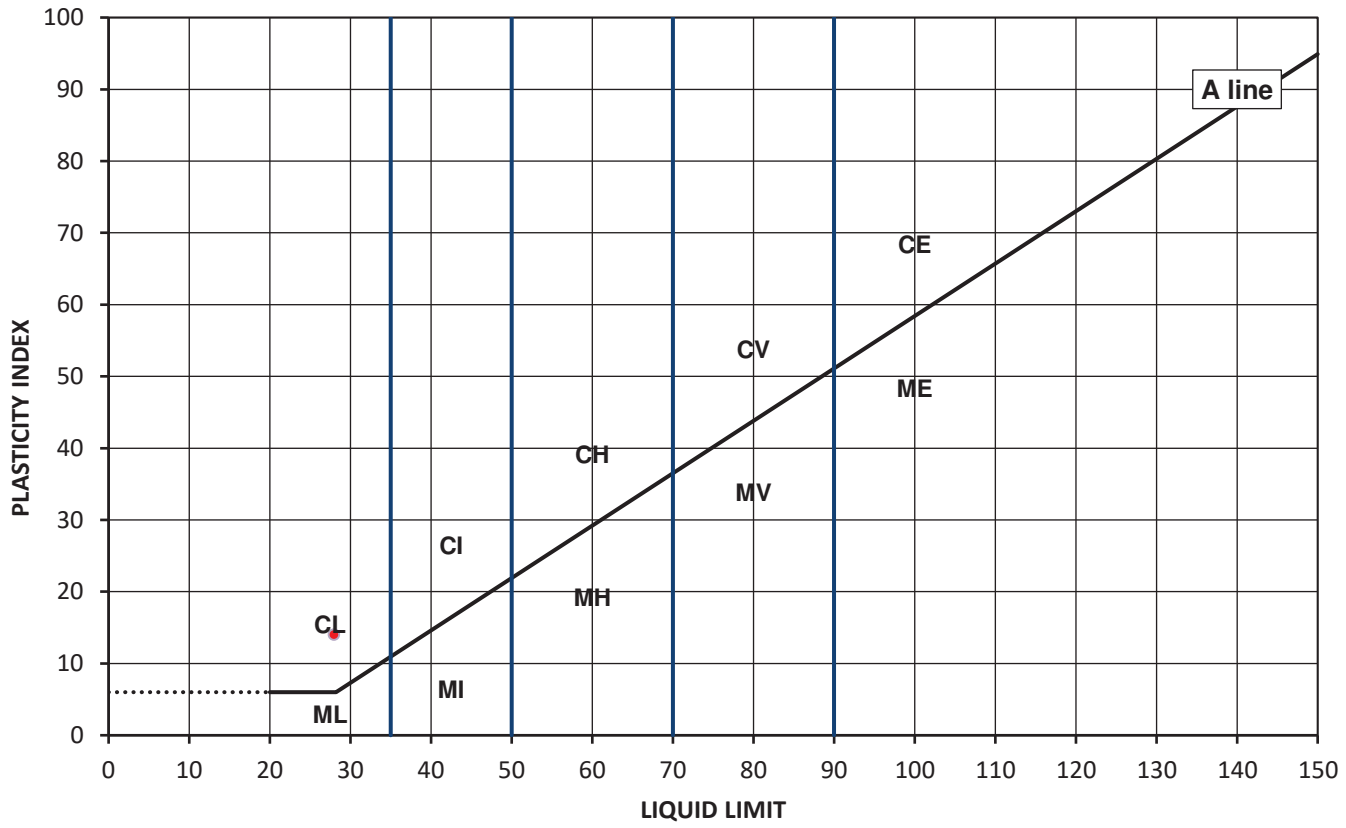
Client:	Brownfield Solutions Ltd	Client Reference:	C4380
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	20-82443
		Date Sampled:	Not Given
		Date Received:	21/01/2020
Contact:	Tim Mayall	Date Tested:	28/01/2020
Site Address:	Everstich Road, Skelmersdale	Sampled By:	JM/TM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1418947	Depth Top [m]:	1.80
Hole No.:	WS10	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
18	28	14	14	83



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 05/02/2020

GF 232.6

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	Brownfield Solutions Ltd	Client Reference:	C4380
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	20-82443
		Date Sampled:	Not Given
		Date Received:	21/01/2020
Contact:	Tim Mayall	Date Tested:	28/01/2020
Site Address:	Everstich Road, Skelmersdale	Sampled By:	JM/TM

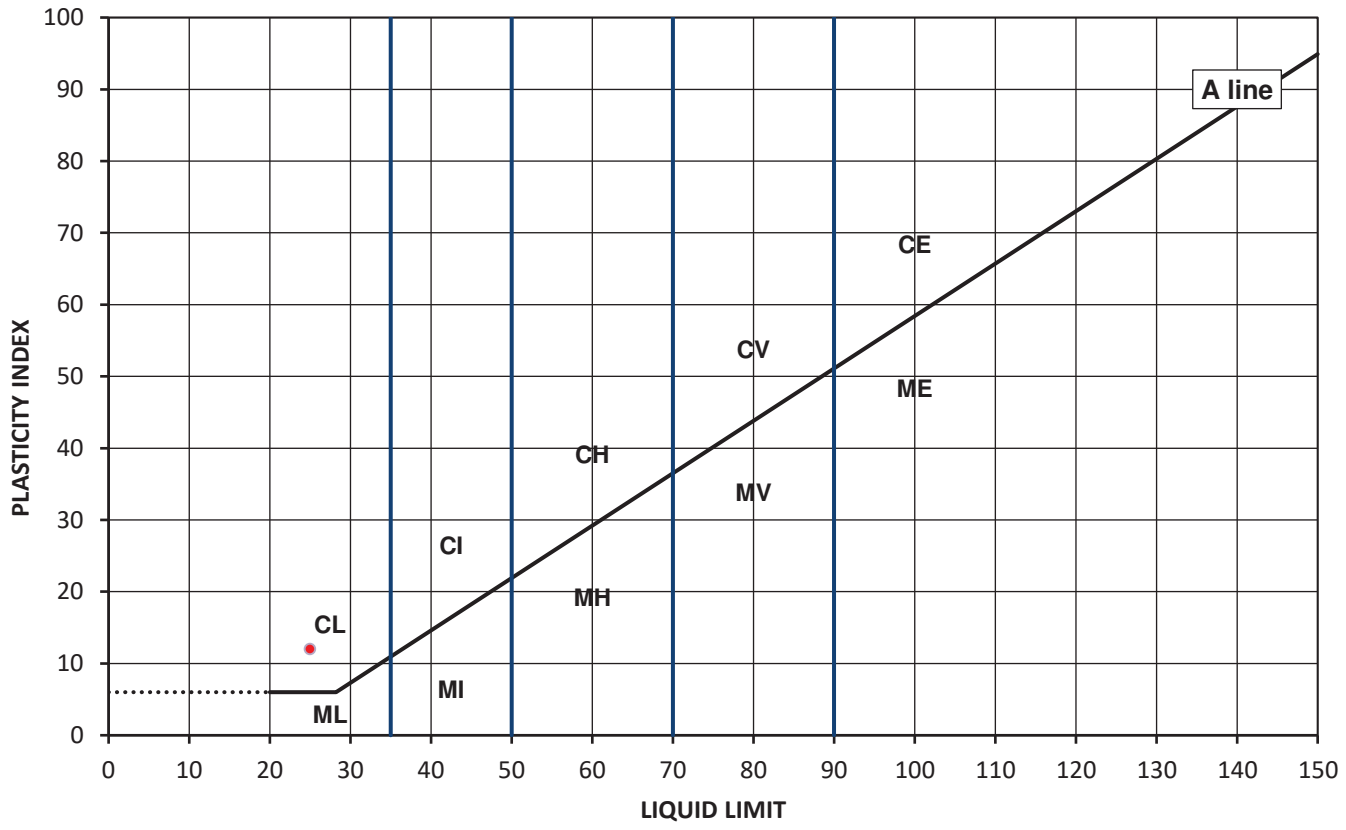
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1418948	Depth Top [m]:	2.20
Hole No.:	WS12	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown clayey SAND		

Sample Preparation: Tested in natural condition

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
19	25	13	12	100



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 05/02/2020

GF 232.6

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

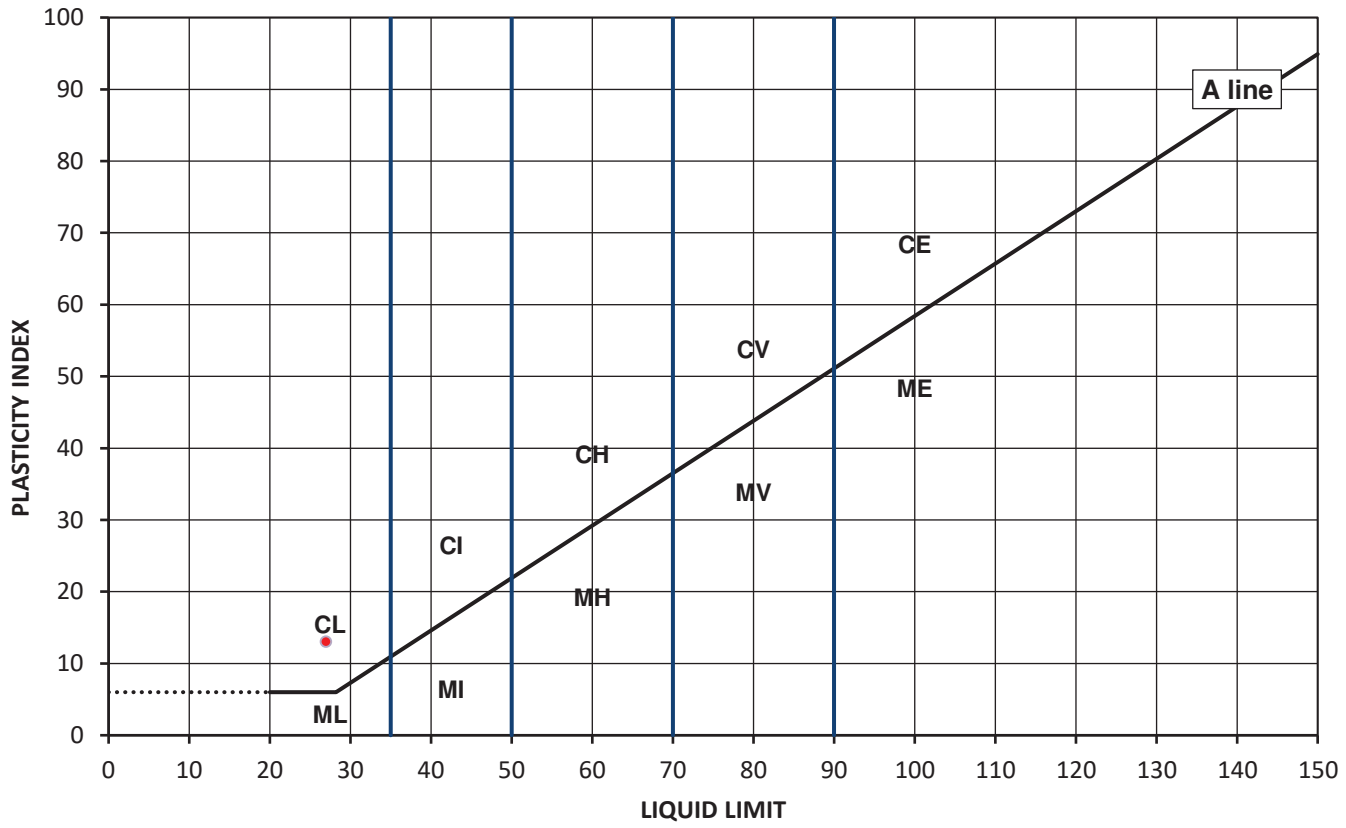
Client:	Brownfield Solutions Ltd	Client Reference:	C4380
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	20-82443
		Date Sampled:	Not Given
		Date Received:	21/01/2020
Contact:	Tim Mayall	Date Tested:	28/01/2020
Site Address:	Everstich Road, Skelmersdale	Sampled By:	JM/TM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1418949	Depth Top [m]:	2.50
Hole No.:	WS07	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
14	27	14	13	97



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 05/02/2020

GF 232.6

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

Client:	Brownfield Solutions Ltd	Client Reference:	C4380
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	20-82443
		Date Sampled:	Not Given
		Date Received:	21/01/2020
Contact:	Tim Mayall	Date Tested:	28/01/2020
Site Address:	Everstich Road, Skelmersdale	Sampled By:	JM/TM

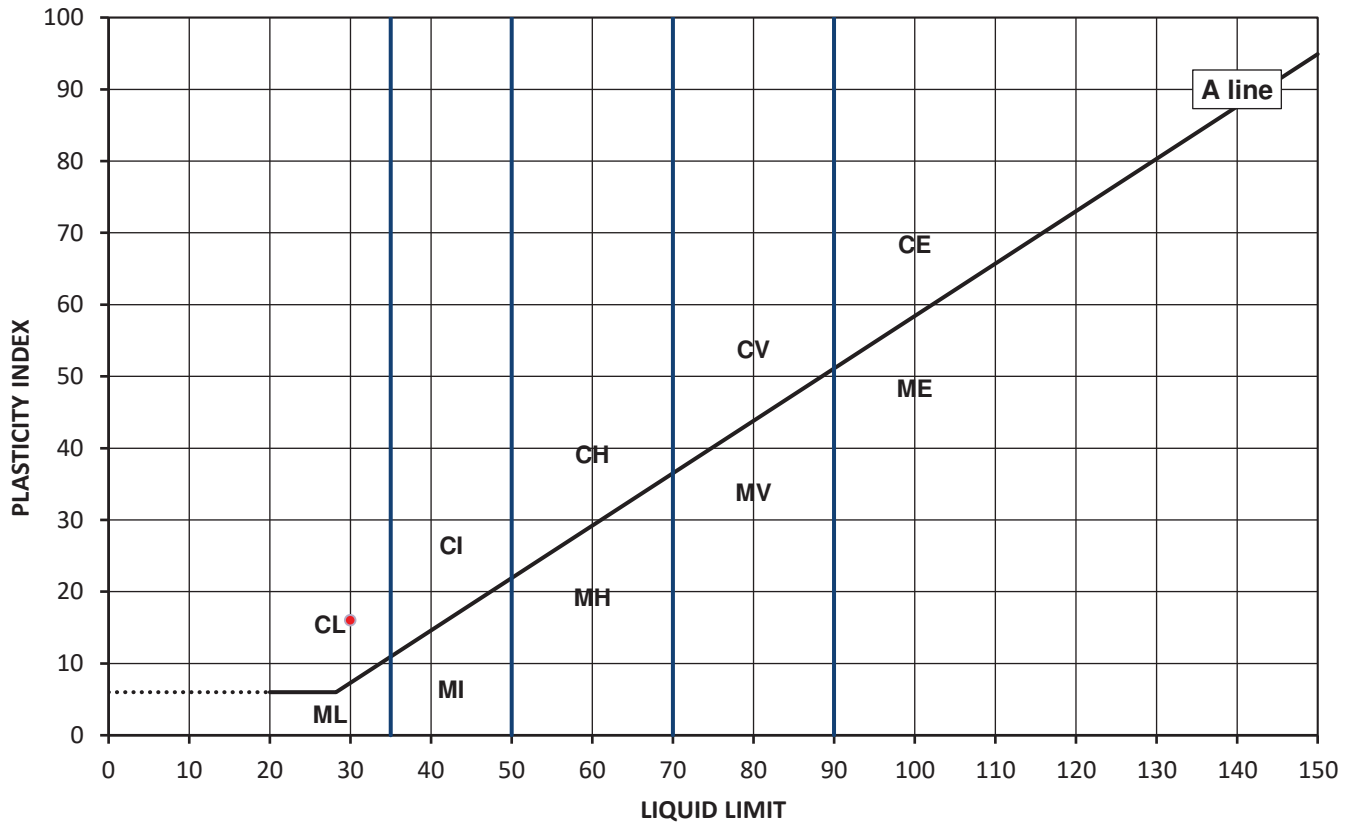
Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1418950	Depth Top [m]:	2.50
Hole No.:	TT03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown gravelly very sandy CLAY		

Sample Preparation: Tested after washing to remove >425um

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
13	30	14	16	62



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 05/02/2020

GF 232.6

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

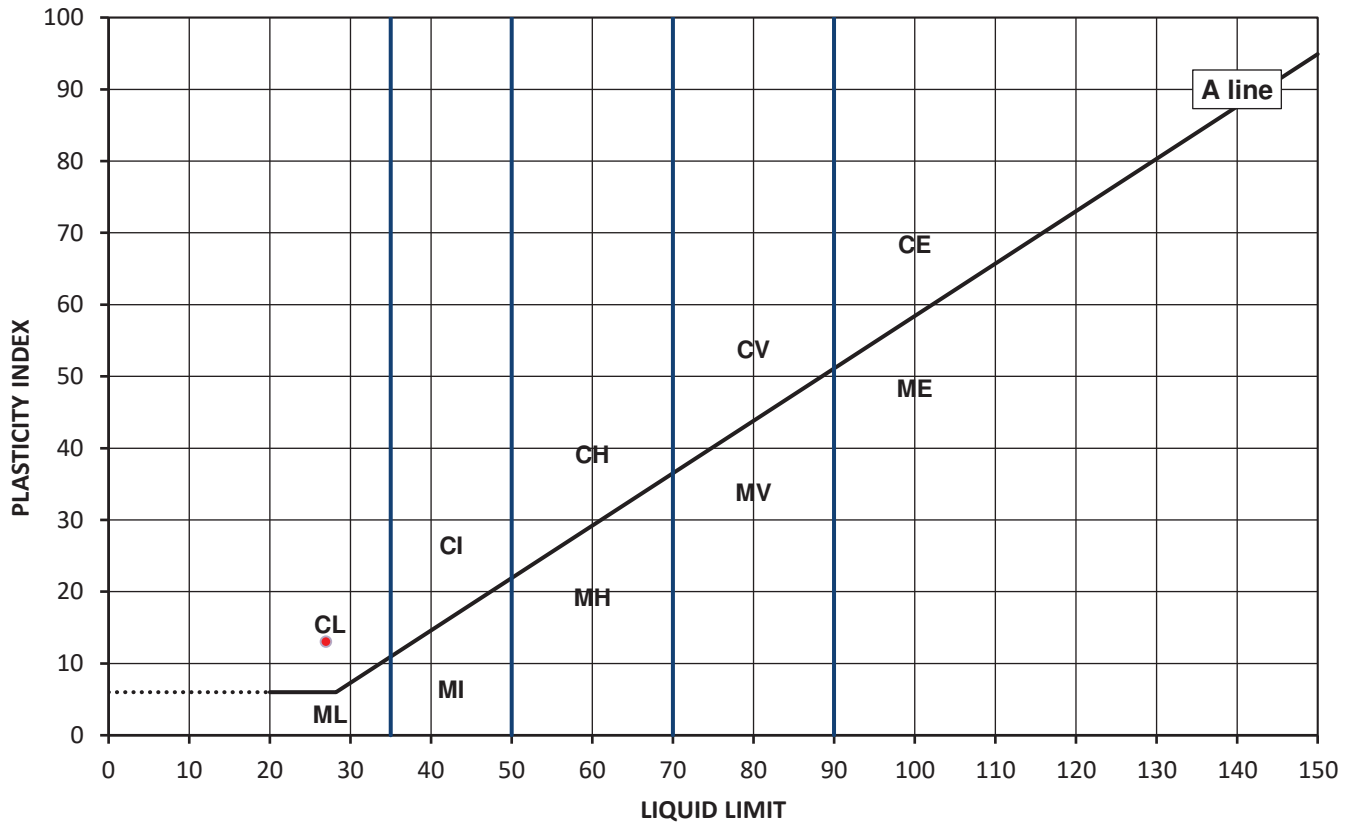
Client:	Brownfield Solutions Ltd	Client Reference:	C4380
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	20-82443
		Date Sampled:	Not Given
		Date Received:	21/01/2020
Contact:	Tim Mayall	Date Tested:	28/01/2020
Site Address:	Everstich Road, Skelmersdale	Sampled By:	JM/TM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1418951	Depth Top [m]:	1.50
Hole No.:	TP03	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
15	27	14	13	97



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
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		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 05/02/2020

GF 232.6

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

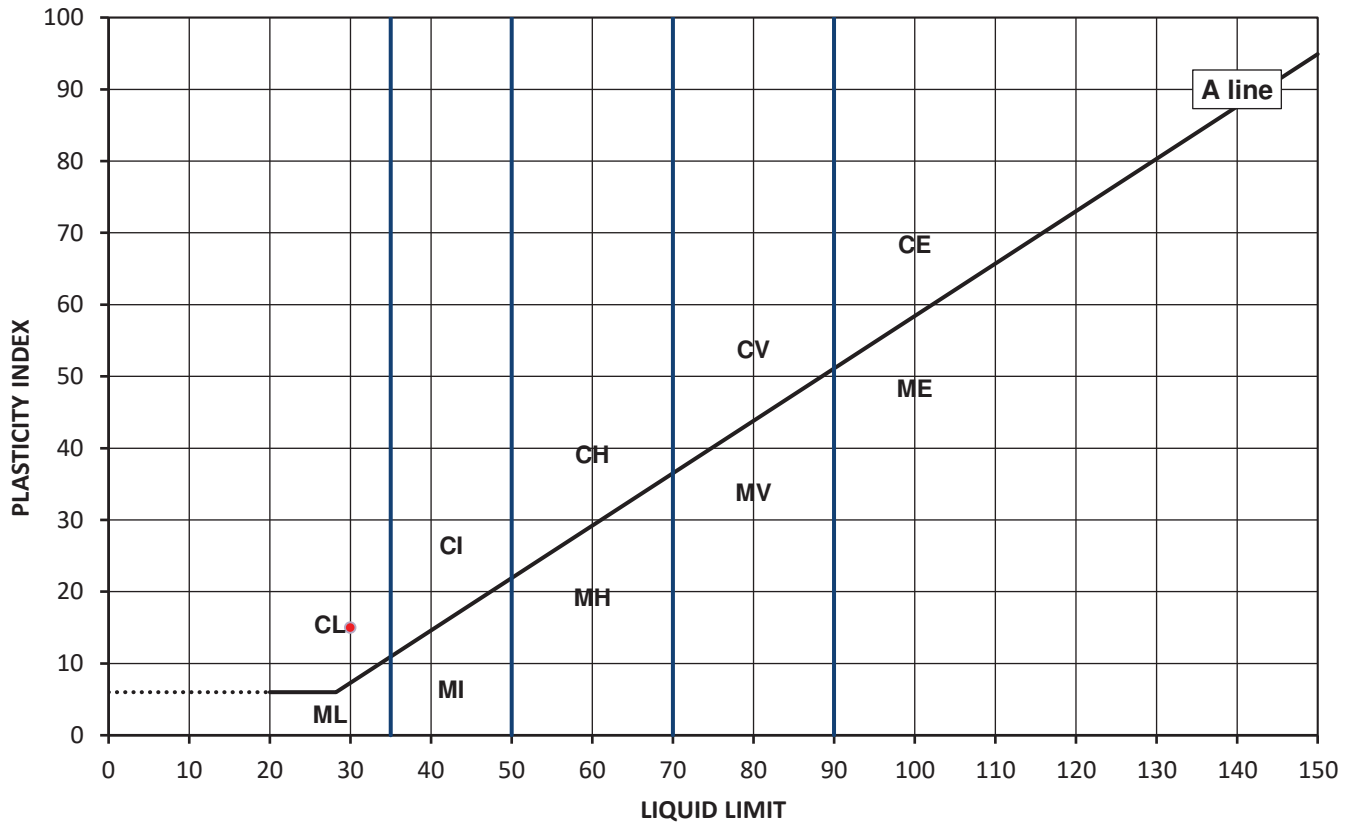
Client:	Brownfield Solutions Ltd	Client Reference:	C4380
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	20-82443
		Date Sampled:	Not Given
		Date Received:	21/01/2020
Contact:	Tim Mayall	Date Tested:	28/01/2020
Site Address:	Everstich Road, Skelmersdale	Sampled By:	JM/TM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1418952	Depth Top [m]:	1.50
Hole No.:	TP01	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
19	30	15	15	93



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
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Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

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PL Geotechnical Laboratory Manager
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Date Reported: 05/02/2020

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

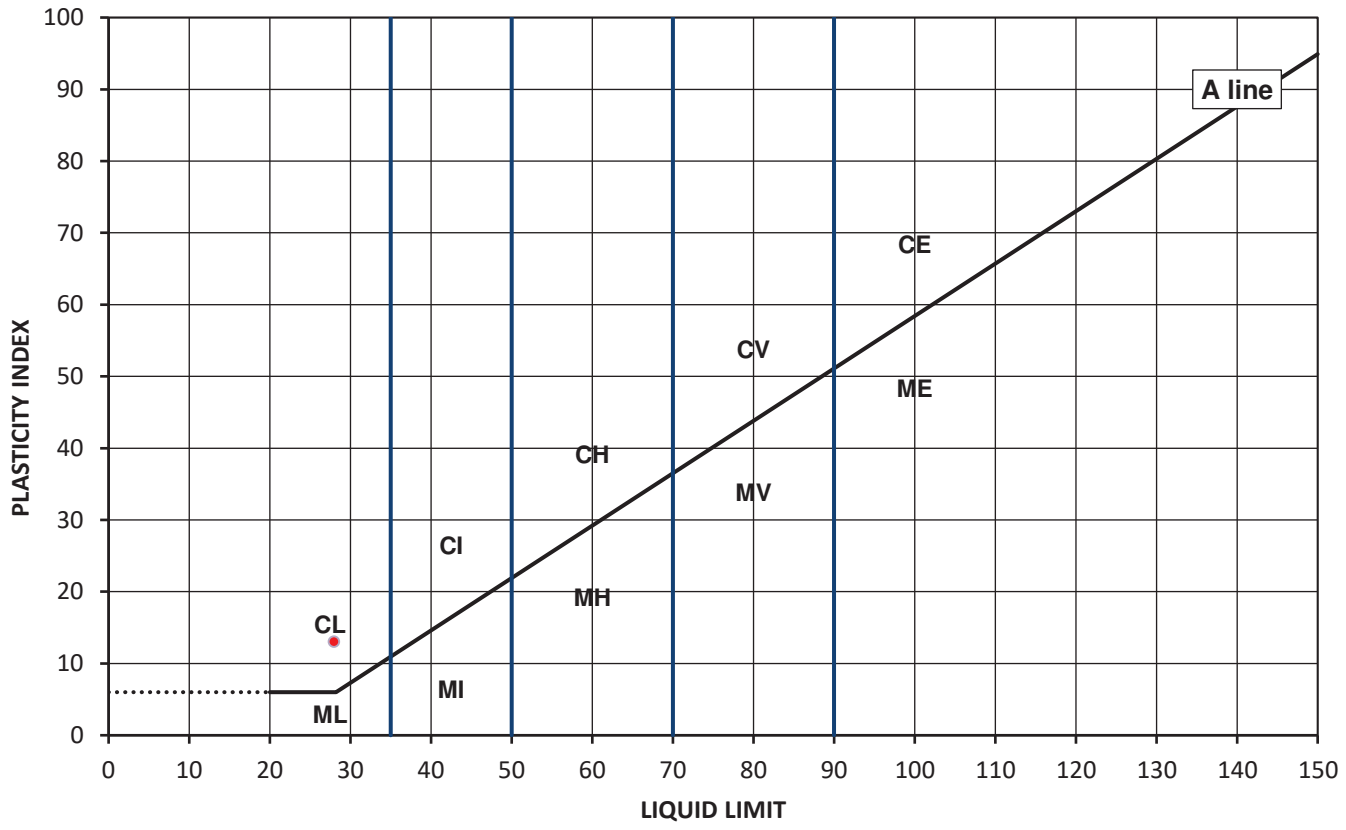
Client:	Brownfield Solutions Ltd	Client Reference:	C4380
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	20-82443
		Date Sampled:	Not Given
		Date Received:	21/01/2020
Contact:	Tim Mayall	Date Tested:	28/01/2020
Site Address:	Everstich Road, Skelmersdale	Sampled By:	JM/TM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1418953	Depth Top [m]:	1.50
Hole No.:	TP04	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
15	28	15	13	94



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 05/02/2020

GF 232.6

TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

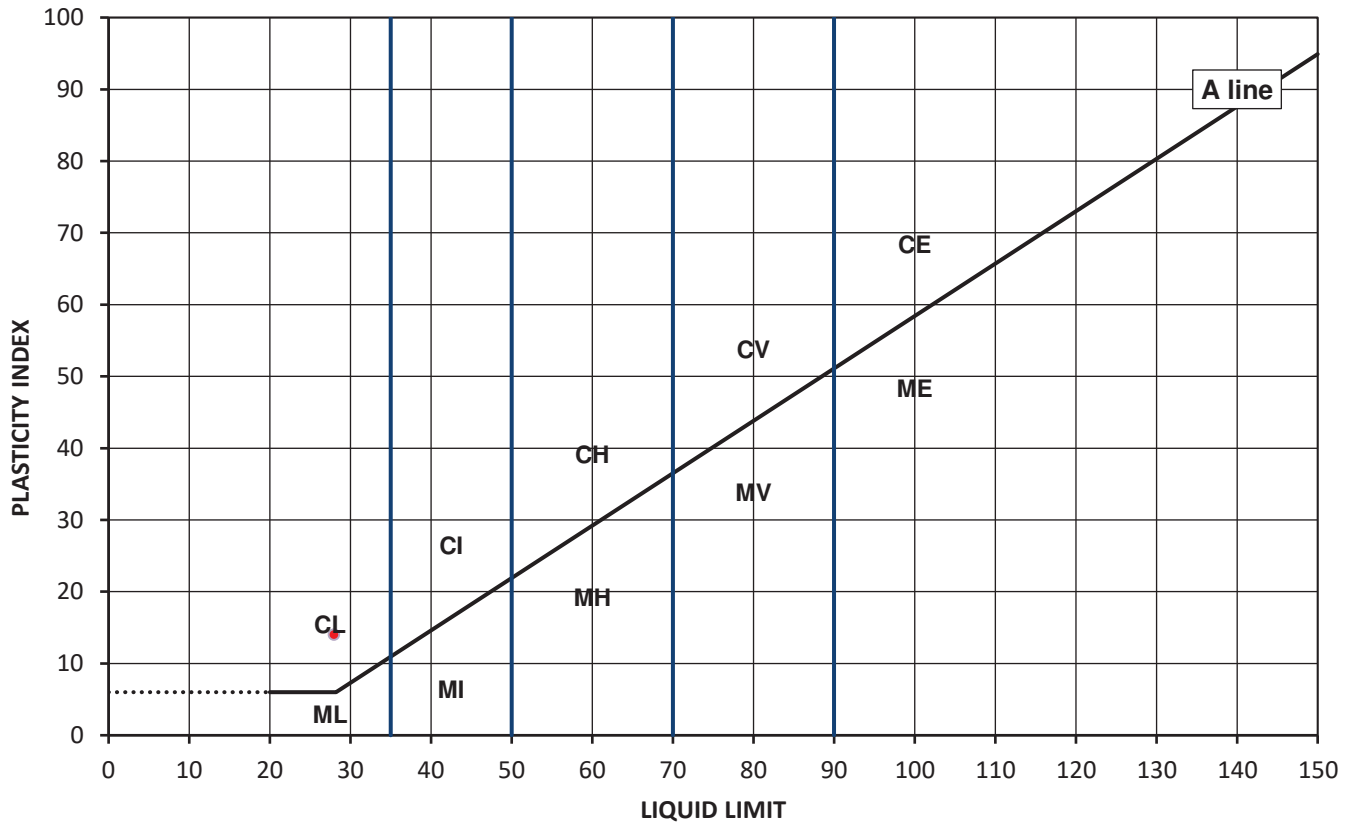
Client:	Brownfield Solutions Ltd	Client Reference:	C4380
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	20-82443
		Date Sampled:	Not Given
		Date Received:	21/01/2020
Contact:	Tim Mayall	Date Tested:	28/01/2020
Site Address:	Everstich Road, Skelmersdale	Sampled By:	JM/TM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1418954	Depth Top [m]:	2.10
Hole No.:	WS18	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
18	28	14	14	96



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 05/02/2020

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TEST CERTIFICATE

Liquid and Plastic Limits

i2 Analytical Ltd
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Northampton NN4 7EB

4041

Tested in Accordance with: BS 1377-2: 1990: Clause 4.4 and 5

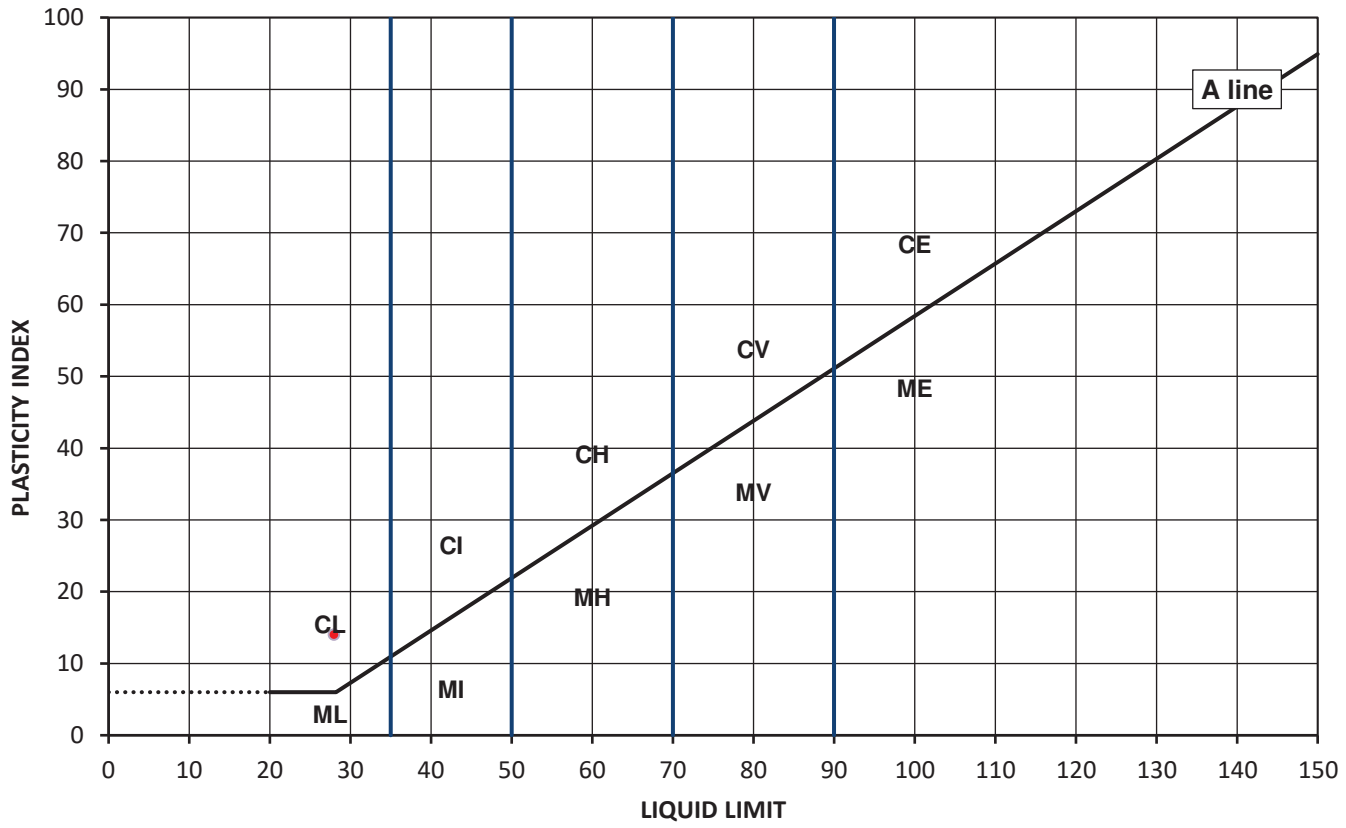
Client:	Brownfield Solutions Ltd	Client Reference:	C4380
Client Address:	William Smith House, 173 - 183 Witton Street, Northwich, Cheshire, CW9 5LP	Job Number:	20-82443
		Date Sampled:	Not Given
		Date Received:	21/01/2020
Contact:	Tim Mayall	Date Tested:	28/01/2020
Site Address:	Everstich Road, Skelmersdale	Sampled By:	JM/TM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test Results:

Laboratory Reference:	1418955	Depth Top [m]:	2.00
Hole No.:	TP07	Depth Base [m]:	Not Given
Sample Reference:	Not Given	Sample Type:	D
Soil Description:	Brown slightly gravelly very sandy CLAY		
Sample Preparation:	Tested after >425um removed by hand		

As Received Moisture Content [%]	Liquid Limit [%]	Plastic Limit [%]	Plasticity Index [%]	% Passing 425µm BS Test Sieve
14	28	14	14	96



Legend, based on BS 5930:2015 Code of practice for site investigations

		Plasticity		Liquid Limit
C	Clay	L	Low	below 35
M	Silt	I	Medium	35 to 50
		H	High	50 to 70
		V	Very high	70 to 90
		E	Extremely high	exceeding 90
	Organic	O	append to classification for organic material (eg CHO)	

Note: Moisture Content by BS 1377-2: 1990: Clause 3.2

Remarks:

Signed:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 05/02/2020

GF 232.6

SUMMARY REPORT

Summary of Classification Test Results

i2 Analytical Ltd
Unit 8 Harrowden Road
Brackmills Industrial Estate
Northampton NN4 7EB

4041

Tested in Accordance with:

MC by BS 1377-2: 1990: Clause 3.2; WC by BS EN 17892-1: 2014; Atterberg by BS 1377-2: 1990: Clause 4.3, Clause 4.4 and 5; PD by BS 1377-2: 1990: Clause 8.2

Client: Brownfield Solutions Ltd

Client Address: William Smith House, 173 - 183 Witton Street,
Northwich, Cheshire, CW9 5LP

Contact: Tim Mayall

Site Address: Everstich Road, Skelmersdale

Client Reference: C4380
Job Number: 20-82443
Date Sampled: Not Given
Date Received: 21/01/2020
Date Tested: 28/01/2020
Sampled By: JM/TM

Testing carried out at i2 Analytical Limited, ul. Pionierow 39, 41-711 Ruda Slaska, Poland

Test results

Laboratory Reference	Hole No.	Sample				Description	Remarks	MC	WC	Atterberg				Density			Total Porosity#		
		Reference	Depth Top	Depth Base	Type					% Passing 425um	LL	PL	PI	bulk	dry	PD			
			m	m				%	%	%	%	%	%	Mg/m3	Mg/m3	Mg/m3	%		
1418952	TP01	Not Given	1.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	19		93	30	15	15						
1418951	TP03	Not Given	1.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	15		97	27	14	13						
1418953	TP04	Not Given	1.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	15		94	28	15	13						
1418955	TP07	Not Given	2.00	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	14		96	28	14	14						
1418946	TP08	Not Given	1.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	17		92	32	15	17						
1418950	TT03	Not Given	2.50	Not Given	D	Brown gravelly very sandy CLAY	Atterberg 1 Point	13		62	30	14	16						
1418949	WS07	Not Given	2.50	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	14		97	27	14	13						
1418947	WS10	Not Given	1.80	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	18		83	28	14	14						
1418948	WS12	Not Given	2.20	Not Given	D	Brown clayey SAND	Atterberg 1 Point	19		100	25	13	12						
1418954	WS18	Not Given	2.10	Not Given	D	Brown slightly gravelly very sandy CLAY	Atterberg 1 Point	18		96	28	14	14						

Note: # Non accredited; NP - Non plastic

Comments:

Signed:

Dariusz Piotrowski
PL Geotechnical Laboratory Manager
for and on behalf of i2 Analytical Ltd

Date Reported: 05/02/2020

GF 234.8

Tim Mayall
Brownfield Solutions Ltd
William Smith House
173 - 183 Witton Street
Northwich
Cheshire
CW9 5LP

e: T.Mayall@brownfield-solutions.co.uk

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

t: 01923 225404
f: 01923 237404
e: reception@i2analytical.com

Analytical Report Number : 20-82450

Replaces Analytical Report Number : 20-82450, issue no. 1

Client sampling date amended.

Project / Site name:	Everstich Road, Skelmersdale	**Samples received on:**	21/01/2020
Your job number:	C4380	**Samples instructed on:**	22/01/2020
Your order number:	C4380-623-JM	**Analysis completed by:**	26/02/2020
Report Issue Number:	2	**Report issued on:**	26/02/2020
Samples Analysed:	12 soil samples		

Signed:

Zina Abdul Razzak
Senior Quality Specialist

For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 20-82450

Project / Site name: Everstich Road, Skelmersdale
Your Order No: C4380-623-JM

Lab Sample Number				1418984	1418985	1418986	1418987	1418988
Sample Reference				WS10	TT03	TP03	TP04	TP10
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	1.50	0.30	0.30	2.00
Date Sampled				13/01/2020	13/01/2020	13/01/2020	13/01/2020	16/01/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	15	16	19	12
Total mass of sample received	kg	0.001	NONE	0.99	0.85	0.80	0.86	0.76
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.5	7.3	6.4	5.7	8.0
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	-	-	-
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.0076	0.030	0.014	0.0088	0.033
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	-	-	-
Total Sulphur	%	0.005	MCERTS	-	-	-	-	-
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	-	-	-
Calorific Value	MJ/Kg	0.12	ISO 17025	-	-	-	-	-
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	-	-	-	-	-
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	-	-	-

Analytical Report Number: 20-82450

Project / Site name: Everstich Road, Skelmersdale
Your Order No: C4380-623-JM

Lab Sample Number				1418989	1418990	1418991	1418992	1418993
Sample Reference				WS09	WS13	TT04	WS17	TP12
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.60	1.20	2.00	1.60	1.20
Date Sampled				13/01/2020	15/01/2020	13/01/2020	15/01/2020	16/01/2020
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	43	22	12	16	11
Total mass of sample received	kg	0.001	NONE	0.61	0.96	0.75	0.69	0.57
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	7.1	7.7	7.9	7.4	7.7
Total Sulphate as SO_4	%	0.005	MCERTS	-	-	0.025	0.006	0.023
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.86	0.018	0.023	0.0098	0.039
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-	1.8	5.0	2.4
Total Sulphur	%	0.005	MCERTS	-	-	0.040	0.008	0.064
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-	< 2.0	< 2.0	< 2.0
Calorific Value	MJ/Kg	0.12	ISO 17025	-	-	-	-	-
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	-	-	10	9.2	25
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-	5.2	4.6	13

Analytical Report Number: 20-82450

Project / Site name: Everstich Road, Skelmersdale
Your Order No: C4380-623-JM

Lab Sample Number				1418994	1418995			
Sample Reference				TT04	TT05			
Sample Number				None Supplied	None Supplied			
Depth (m)				4.70	3.40			
Date Sampled				13/01/2020	13/01/2020			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	**Units**	**Limit of detection**	**Accreditation Status**					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	10	17			
Total mass of sample received	kg	0.001	NONE	0.50	0.57			
General Inorganics								
pH - Automated	pH Units	N/A	MCERTS	-	-			
Total Sulphate as SO_4	%	0.005	MCERTS	-	-			
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	-	-			
Water Soluble Chloride (2:1) (leachate equivalent)	mg/l	0.5	MCERTS	-	-			
Total Sulphur	%	0.005	MCERTS	-	-			
Water Soluble Nitrate (2:1) as N (leachate equivalent)	mg/l	2	NONE	-	-			
Calorific Value	MJ/Kg	0.12	ISO 17025	29.0	15.6			
Heavy Metals / Metalloids								
Magnesium (water soluble)	mg/kg	5	NONE	-	-			
Magnesium (leachate equivalent)	mg/l	2.5	NONE	-	-			

Analytical Report Number : 20-82450

Project / Site name: Everstich Road, Skelmersdale

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1418984	WS10	None Supplied	0.50	Brown sand.
1418985	TT03	None Supplied	1.50	Brown clay.
1418986	TP03	None Supplied	0.30	Brown loam and sand with gravel and vegetation.
1418987	TP04	None Supplied	0.30	Brown loam and sand with gravel and vegetation.
1418988	TP10	None Supplied	2.00	Brown clay with gravel.
1418989	WS09	None Supplied	1.60	Brown sandy clay with gravel.
1418990	WS13	None Supplied	1.20	Brown sand.
1418991	TT04	None Supplied	2.00	Brown clay with gravel.
1418992	WS17	None Supplied	1.60	Brown sand.
1418993	TP12	None Supplied	1.20	Brown clay with gravel.
1418994	TT04	None Supplied	4.70	Black gravel with coal.**
1418995	TT05	None Supplied	3.40	Black clay and sand with gravel and coal.

** NON MCERTS MATRIX

The results included within the report are representative of the samples submitted for analysis.

Analytical Report Number : 20-82450

Project / Site name: Everstich Road, Skelmersdale

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Calorific Value of soil	Determination of the calorific value of soil by combustion in a controlled environment.	Calorific Value of Soil by Bomb Calorimeter	L013-PL	D	ISO 17025
Chloride, water soluble, in soil	Determination of Chloride colorimetrically by discrete analyser.	In house method.	L082-PL	D	MCERTS
Magnesium, water soluble, in soil	Determination of water soluble magnesium by extraction with water followed by ICP-OES.	In-house method based on TRL 447	L038-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically. (30 oC)	In house method.	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In house method.	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In house method.	L038-PL	D	MCERTS
Total Sulphate in soil as %	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Total Sulphur in soil as %	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In house method.	L038-PL	D	MCERTS
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate by reaction with sodium salicylate and colorimetry.	In-house method based on Examination of Water and Wastewatern & Polish Standard Method PN-82/C-04579.08, 2:1 extraction.	L078-PL	W	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.
For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.
Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.

APPENDIX E

Monitoring Results

Ground Gas Monitoring Results

BROWNFIELD SOLUTIONS LTD

CLIENT:	Date	Operator	Analsyer	Weather Observations			Temp (°C)	Pressure Trend	Notes
BELLWAY HOMES LTD (NW)	03/02/2020	JM	GFM436	Overcast	No wind	Cool	8	Steady	
JOB NO.	10/02/2020	TM	GFM436	Intermittent cloud	Heavy gusts	Cold	6	Rising	
C4380	21/02/2020	PG	GFM436	Overcast	Light breeze	Cool	11	Falling	
SITE:	17/03/2020	GP	GFM436	Overcast	No wind	Cool	13	Rising	
LATHOM PASTURES (PHASE 2)	31/03/2020	JM	GFM436	Overcast	No wind	Cool	14	Rising	
	09/04/2020	JM	GFM436	Overcast	No wind	Warm	19	Steady	

Notes: mb = milibars; CH_4 = methane; LEL = lower explosive limit = 5%v/v; CO_2 = carbon dioxide; O_2 = oxygen; CO=carbon monoxide; H_2S = hydrogen sulphide; TVOC= Total volatile organic compounds; PPM = parts per million. Where the flow is less than the limit of detection of the instrument, the detection limit is reported (Highlighted in green). Gas Screening Values (GSVs) are rounded to 3 decimal places. Calibration Records for analysers used availble on request.

Date	Time	Location	Response zone (m)	Pressures (mb)		Gas flows (l/hr)		CH_4 (%v/v)		CH_4 (%LEL)		CO_2 (%v/v)		O_2 (%v/v)		Other Gases (PPM)			Depth to Water (m)	Well Base (m)	Gas Screening Value (CH_4) (l/hr)	Gas Screening Value (CO_2) (l/hr)	Notes
				Atmospheric Pressure	Relative Well Pressure	Initial	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	CO	H_2S	TVOC (PID)					
				Summary Statistcs																			
			Max. values:	1030	25.0	35.8	4.0	1.2	0.4	24.0	8.0	10.9	9.9	20.7	20.9	36.0	0.0	NA	4.21	16.45	0.001	0.076	
			Min. values:	982	-7.0	-1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	4.0	0.0	0.0	NA	0.00	1.00	0.000	0.000	
				Worst-case GSVs based on maximum recorded steady flow and maximum individual peak concentrations:																	0.048	0.436	
03/02/2020	PM	Ambient	-	1006	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	20.8	20.8	0.0	0.0	NA	-	-	-	-	
		WS01	0.50-2.50	-	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.8	0.7	20.3	20.5	0.0	0.0	NA	0.60	2.51	0.000	0.001	
		WS05	1.00-3.00	-	0.0	0.3	0.3	0.0	0.0	0.0	0.0	4.1	0.8	12.3	18.8	0.0	0.0	NA	0.80	2.73	0.000	0.012	
		WS06	1.00-4.00	-	0.0	0.3	0.3	0.0	0.0	0.0	0.0	3.3	0.3	19.3	20.6	0.0	0.0	NA	0.64	4.00	0.000	0.010	
		WS09	1.00-4.00	-	0.0	NA	0.1	NA	0.0	NA	0.0	NA	0.1	NA	20.6	0.0	0.0	NA	0.80	4.00	NA	NA	No peak value, gas tap blocked.
		WS15	0.50-2.00	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	1.6	0.5	14.5	19.4	36.0	0.0	NA	0.87	1.80	0.000	0.002	
		WS18	0.50-2.00	-	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.1	20.6	20.6	0.0	0.0	NA	0.80	1.25	0.000	0.000	
		RO02	10.00-14.00	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	9.7	1.9	7.2	18.5	0.0	0.0	NA	0.77	7.15	0.000	0.010	
		RO08	16.00-18.00	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.2	20.2	20.3	0.0	0.0	NA	3.35	16.45	0.000	0.000	
		Ambient	-	1007	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	20.7	20.7	0.0	0.0	NA	-	-	-	-	
10/02/2020	AM	Ambient	-	983	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	20.4	20.4	0.0	0.0	NA	-	-	-	-	
		WS01	0.50-2.50	-	0.0	2.7	0.1	0.0	0.0	0.0	0.0	0.2	0.0	20.5	20.6	0.0	0.0	NA	0.09	2.15	0.000	0.000	
		WS05	1.00-3.00	-	0.0	0.3	0.7	0.0	0.0	0.0	0.0	0.7	0.3	19.9	20.2	0.0	0.0	NA	0.21	2.47	0.000	0.005	
		WS06	1.00-4.00	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.1	20.1	20.4	0.0	0.0	NA	0.12	3.75	0.000	0.000	
		WS09	1.00-4.00	-	0.3	2.9	0.3	0.0	0.0	0.0	0.0	0.6	0.0	19.9	20.3	0.0	0.0	NA	0.00	4.25	0.000	0.002	
		WS15	0.50-2.00	-	3.6	35.8	0.0	0.0	0.0	0.0	0.0	1.6	0.8	14.5	17.8	10.0	0.0	NA	0.18	1.35	0.000	0.000	
		WS18	0.50-2.00	-	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	20.3	20.6	0.0	0.0	NA	0.39	1.00	0.000	0.000	
		RO02	10.00-14.00	-	0.0	9.3	0.6	0.0	0.0	0.0	0.0	9.4	5.0	11.6	15.6	0.0	0.0	NA	0.27	6.80	0.000	0.056	Steady-state gas monitoring terminated early due to groundwater entering tube
		RO08	16.00-18.00	-	0.0	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	20.3	20.4	0.0	0.0	NA	3.26	16.18	0.000	0.000	
		Ambient	-	982	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0.0	0.0	NA	-	-	-	-	
21/02/2020	AM	Ambient	-	1005	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	20.4	20.4	0.0	0.0	NA	-	-	-	-	
		WS01	0.50-2.50	-	0.0	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	20.4	20.4	0.0	0.0	NA	0.00	2.50	0.000	0.000	
		WS05	1.00-3.00	-	25.0	4.2	0.0	0.0	0.0	0.0	0.0	5.0	0.8	12.1	19.2	0.0	0.0	NA	0.00	2.78	0.000	0.000	
		WS06	1.00-4.00	-	0.0	0.4	0.4	0.0	0.0	0.0	0.0	0.9	0.1	19.9	20.3	0.0	0.0	NA	0.00	3.98	0.000	0.004	
		WS09	1.00-4.00	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	19.4	20.4	0.0	0.0	NA	0.00	4.20	0.000	0.000	
		WS15	0.50-2.00	-	5.0	0.4	0.4	0.0	0.0	0.0	0.0	1.6	0.3	17.6	19.8	10.0	0.0	NA	0.00	1.75	0.000	0.006	
		WS18	0.50-2.00	-	-1.0	0.4	0.4	0.0	0.0	0.0	0.0	0.0	0.0	20.4	20.4	0.0	0.0	NA	0.53	1.20	0.000	0.000	
		RO02	10.00-14.00	-	5.0	1.2	1.2	0.0	0.0	0.0	0.0	0.8	0.4	20.0	20.2	0.0	0.0	NA	0.00	7.10	0.000	0.010	
		RO08	16.00-18.00	-	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	20.2	20.4	0.0	0.0	NA	3.15	16.32	0.000	0.000	
		Ambient	-	995	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0.0	0.0	NA	-	-	-	-	

Ground Gas Monitoring Results

BROWNFIELD SOLUTIONS LTD

Date	Time	Location	Response zone (m)	Pressures (mb)		Gas flows (l/hr)		CH_4 (%v/v)		CH_4 (%LEL)		CO_2 (%v/v)		O_2 (%v/v)		Other Gases (PPM)			Depth to Water (m)	Well Base (m)	Gas Screening Value (CH_4) l/hr)	Gas Screening Value (CO_2) l/hr)	Notes
				Atmospheric Pressure	Relative Well Pressure	Initial	Steady	Peak	Steady	Peak	Steady	Peak	Steady	Peak	Steady	CO	H_2S	TVOC (PID)					
17/03/2020	PM	Ambient	-	1013	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0.0	0.0	NA	-	-	-	-	
		WS01	0.50-2.50	-	3.0	0.6	0.1	0.0	0.0	0.0	0.0	2.4	0.5	20.1	20.7	0.0	0.0	NA	0.33	2.39	0.000	0.002	
		WS05	1.00-3.00	-	1.0	0.1	0.0	0.0	0.0	0.0	0.0	2.9	0.7	17.1	2.9	0.0	0.0	NA	0.61	2.71	0.000	0.000	
		WS06	1.00-4.00	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.3	20.4	20.6	0.0	0.0	NA	0.47	3.89	0.000	0.000	
		WS09	1.00-4.00	-	-7.0	-1.6	0.0	0.0	0.0	0.0	0.0	0.9	0.0	16.0	20.6	0.0	0.0	NA	0.22	4.51	0.000	0.000	
		WS15	0.50-2.00	-	-3.0	-0.6	0.0	0.0	0.0	0.0	0.0	0.8	0.3	19.5	20.5	0.0	0.0	NA	0.63	1.66	0.000	0.000	
		WS18	0.50-2.00	-	3.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	20.7	20.7	0.0	0.0	NA	0.63	1.11	0.000	0.000	
		RO02	10.00-14.00	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.1	20.2	20.8	0.0	0.0	NA	0.46	7.00	0.000	0.000	
		RO08	16.00-18.00	-	1.0	0.1	0.0	0.0	0.0	0.0	0.0	0.4	0.0	18.5	20.7	0.0	0.0	NA	2.72	16.14	0.000	0.000	
		Ambient	-	1010	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	20.8	20.8	0.0	0.0	NA	-	-	-	-	
31/03/2020	AM	Ambient	-	1030	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0.0	0.0	NA	-	-	-	-	
		WS01	0.50-2.50	-	0.0	0.4	0.3	0.0	0.0	0.0	0.0	0.5	0.4	20.2	20.2	0.0	0.0	NA	1.32	2.35	0.000	0.002	
		WS05	1.00-3.00	-	0.0	0.1	0.1	1.2	0.4	24.0	8.0	10.9	8.7	3.2	4.0	0.0	0.0	NA	2.65	2.70	0.001	0.011	
		WS06	1.00-4.00	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.3	0.1	19.6	19.9	0.0	0.0	NA	1.40	3.87	0.000	0.000	
		WS09	1.00-4.00	-	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.8	0.4	19.1	20.0	0.0	0.0	NA	1.39	4.49	0.000	0.001	
		WS15	0.50-2.00	-	1.0	0.5	0.2	0.0	0.0	0.0	0.0	2.0	1.8	18.6	18.9	22.0	0.0	NA	1.50	1.66	0.000	0.004	
		WS18	0.50-2.00	-	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.6	0.2	19.3	19.3	0.0	0.0	NA	0.98	1.10	0.000	0.001	
		RO02	10.00-14.00	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	5.2	4.5	18.8	19.6	0.0	0.0	NA	1.23	7.00	0.000	0.005	
		RO08	16.00-18.00	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.7	0.1	19.6	19.8	0.0	0.0	NA	3.97	16.11	0.000	0.001	
		Ambient	-	1030	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	20.6	20.6	0.0	0.0	NA	-	-	-	-	
09/04/2020	AM	Ambient	-	1017	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	21.0	21.0	0.0	0.0	NA	-	-	-	-	
		WS01	0.50-2.50	-	0.0	0.3	0.1	0.0	0.0	0.0	0.0	6.8	5.5	13.2	14.6	0.0	0.0	NA	NGW	2.35	0.000	0.007	
		WS05	1.00-3.00	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	10.6	9.9	2.8	5.2	0.0	0.0	NA	1.26	2.70	0.000	0.011	
		WS06	1.00-4.00	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.6	0.2	20.0	20.8	0.0	0.0	NA	1.75	3.80	0.000	0.001	
		WS09	1.00-4.00	-	1.0	4.1	3.3	0.0	0.0	0.0	0.0	1.7	1.4	17.6	18.2	0.0	0.0	NA	0.75	4.45	0.000	0.056	
		WS15	0.50-2.00	-	1.0	4.1	4.0	0.0	0.0	0.0	0.0	1.9	1.9	16.8	19.3	0.0	0.0	NA	1.52	1.65	0.000	0.076	
		WS18	0.50-2.00	-	5.0	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.1	20.7	20.9	0.0	0.0	NA	1.00	1.10	0.000	0.000	
		RO02	10.00-14.00	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	9.3	8.0	7.4	9.2	0.0	0.0	NA	2.05	7.00	0.000	0.009	
		RO08	16.00-18.00	-	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.5	0.2	20.0	20.2	0.0	0.0	NA	4.21	16.14	0.000	0.001	
		Ambient	-	1016	-	-	-	0.0	0.0	0.0	0.0	0.0	0.0	21.0	21.0	0.0	0.0	NA	-	-	-	-	

TEST DATE AND CONDITIONS		
Date	12 - 7 - 19	
Atmospheric Pressure	1001	mB
Ambient Temp	24.7	°C
Environics Serial No.	2633 / 2518	

GAS DATA LTD
Pegasus House
Seven Stars Estate
Wheler Rd.
Coventry
CV3 4LB
Tel: 024 76 303311 Fax: 024 76 307711

GFM436-1 OUTWARD INSPECTION & QUALITY CHECK SHEET

INSTRUMENT DETAILS					
SO Number	Instrument Banner	Instrument Serial Number + SW Version	Job Number(s)		
323089	GFM436	13233 + 27.10	W016786	—	—

Calibration Technician [signature] **DATE** 11-7-19

Inspection Technician [signature] **DATE** 12-7-19

INSTRUMENT CHECKS		Pass (P), Fail (F) or not applicable(NA)	INSTRUMENT PACKING LIST		Tick if included
Function Tests	Dust Caps Fitted	P	Instrument		✓
	Keyboard Test (All keys)	P	Leather Case		✓
	Backlight Test	P	Instrument Strap		✓
	Clock Set / Running	P	AC Battery Charger (UK)		✓
	Comms Test	P	AC Battery Charger (EURO)		✗
	Pump Flow Test (In & Out)	P	AC Battery Charger (US)		✗
	Overall Leak Test (30mb)	NA	AC Battery Charger (AUS)		✗
	Battery Charge Test	P	Gas Sample Pipe		✓
	Service Date set to?	11-7-20	Hard Carry Case		✓
Channel Tests	Data Logging Enabled?	P	Spares Pot		✓
	Verify CH4/LEL/Hexane/PID	P	Allen Key		✓
	Verify CO2	P	Flow Sample Pipe		✓
	Verify O2	P	Temperature Probe		✗
	Verify H2S	P	Vane Anemometer		✗
	Verify CO	P	USB Cable		✓
	Verify LEL	P	USB Memory Stick		✓
	Verify 1st Option gas	NA	SM V5 Software	Ver 6.05	✓
	Verify atmospheric pressure	P	Internal Filter Pack	Qty	✗
	Verify differential pressure	P	External Filter Pack	Qty	✗
	Verify flow	P	Field Guide		✓
	Verify temperature probe input	P	Extra Items:		
	Verify vane anemometer input	P			
DataBase Checks	Jobcard(s) completed and signed	P			
	Jobcard(s) booked off database	P			
	Calibration certificate completed	P			
	Complete & print QI record	NA			
Label Checks	No. of Calibration label fitted	GDC09751	Comments		
	MCERTS label not displayed	P			
	Warranty label fitted	P			
H2S Range	H2S Range from SO	5000			
	H2S Range from cal cert	5000			
	Over-range value correct?	P			

TEST DATE AND CONDITIONS	
Date	11/7/19
Atmospheric Pressure	999mB
Ambient Temp	24.0°C
Environics Serial No.	2633

GAS DATA LTD
Pegasus House
Seven Stars Estate
Wheler Rd
Coventry
CV3 4LB
Tel 02476303311 Fax 02476307711

GFM436-1 FINAL INSPECTION & CALIBRATION CHECK CERTIFICATE

INSTRUMENT DETAILS	
Serial No	Customer
13233	Brownfield Solutions Ltd

INSTRUMENT CHECKS			
Keyboard	✓	Pump Flow	500cc/min
Display Contrast	✓	Pump Flow @ -200mB	300cc/min
Clock Set / Running	✓	S/W Version	G436-00.0027/0010
Labels Fitted	✓	Recalibration Date	11/7/20

GAS CHECKS							
Calibration Gas		Instrument Gas Channels Read					
Gas Type	Applied Conc.	CH4 (%)	tol. (% vol.)	CO2 (%)	tol. (% vol.)	O2 (%)	tol. (% vol.)
N2	100%	0.0	0.0	0.0	0.0	0.0	+/-0.1
CH4	5%	5.0	+/-0.3	0.0	0.0	0.0	+/-0.1
	60%	60.6	+/-3.0	0.0	0.0	0.0	+/-0.1
CO2	5%	0.0	0.0	4.9	+/-0.3	0.0	+/-0.1
	40%	0.0	0.0	40.5	+/-3.0	0.0	+/-0.1
O2	20.9%	0.0	0.0	0.0	+0.1	20.9	+/-0.5

OPTIONAL GAS CHECKS								
Calibration Gas		Instrument Gas Channels Read						
Gas Type	Applied Conc.	Label	H2S	CO			Hexane	tol. (% vol.)
		Range	5000ppm	2000ppm			2.00%	
N2	100%		0	0			0.0	+/- 5.0
H2S	1500ppm		1510	0				+/- 5.0
CO	1000ppm		40	1003				+/- 5.0
Hexane	2.00%						1.992	+/- 10.0

PRESSURE CHECKS							
Calibration Pressure		Instrument Pressure Channels Read					
Pressure @	Applied Pressure	Atmospheric [Ap] (mB)	tol. (mB)				
All Ports	Current Atmospheric	999	+/-2.0				
Ap Port (Internal)	+800mB(a)	801	+/-5.0				
	+1200mB(a)	1199	+/-5.0				

TEST DATE AND CONDITIONS	
Date	11/7/19
Atmospheric Pressure	999mB
Ambient Temp	24.0°C
Environics Serial No.	2633

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FLOW CHECKS					
Calibration Flow		Instrument Flow Channels Read			
Applied Flow (l/hour)	Applied Pressure (Pa)	Flow [Flow] (l/hour)	tol. (l/hour)	Differential Pressure [Dp] (Pa)	tol. (Pa)
-30.0	-399	-28.9	+/-3.0	-391	+/-50
-3.0	-18	-3.0	+/-1.0	-19	+/-6
0.0	0	0.0	0.0	0	0.0
+3.0	15	3.0	+/-0.5	15	+/-3
+30.0	325	29.7	+/-3.0	326	+/-50
+60.0	992	60.3	+/-6.0	1009	+/-130
+90.0	1951	90.8	+/-9.0	1996	+/-250

TEMPERATURE CHECK		
Calibration Temperature	Instrument Temperature Channel Read	
Applied Equivalent Temperature (°C)	Temperature [Temp] (°C)	tol. (°C)
-10.0	-10.0	+/- 2.0
0.0	0.0	+/- 1.0
30.0	30.0	+/- 1.0
60.0	60.0	+/- 1.0
100.0	100.0	+/- 1.0

Notes:

The instrument identified by the serial number stated above has been tested by Gas Data personnel for calibration accuracy on the date and under the ambient conditions stated. Gas Data Ltd internal BS EN ISO9001:2015 compliant workshop procedures were followed to apply known calibration test gases, gas flow rates, pressures and temperatures of the values stated. The results displayed on the instrument at each stage are recorded above.

Gas Data Ltd is certified to BS EN ISO9001:2015, Certificate NQA 8374. Valid until 22/03/2019

APPENDIX F

Waste Assessment Report