

CONFIDENTIAL REPORT

Lucideon Reference: 173136 (QT-44821/2/KNA)/Ref. 1

Project Title: Initial Evaluation of Clay Deposits for Potential use as Brick Clay

Client: Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

For the Attention of: Mr. Chris Williamson

Author(s): Dr Richard White

Report Date: 27 October, 2017

Purchase Order No.: CW/Loxwood

Work Location: Lucideon UK



Mrs Sharon Mansfield
Testing Team
Reviewer



Dr Richard White
Testing Team
Project Manager



SUMMARY

Protreat Ltd are evaluating a Weald clay deposit from South East Sussex. Composite samples were prepared from two of the borehole samples. These samples were subjected to some initial tests to assess whether they have potential as a brick clay and to collect some base information.

The four composite core samples produce brick like material upon firing. Two sample were classic brick red, two were somewhat darker in colour. Two samples; 1B & 1C and 5A & 5B contain higher concentrations of iron and appear to be over fired at the trial firing temperature of 1060°C. All samples exhibit a degree of soluble salt formation upon firing.



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1 INTRODUCTION

Protreat Ltd are evaluating a clay deposit from South East Sussex. The site is located at Loxwood and is stratigraphically located in the Weald Clay.

Four composite samples were prepared from two of the borehole samples. These samples were subjected to some initial tests to assess whether they have potential as a brick clay and to collect some base information.

The current work forms the initial stage of an examination and includes chemical analysis by XRF and Leco carbon, sulphur analysis, particle size and fired appearance.

2 EXPERIMENTAL

2.1 Visual Examination of Clay Samples Supplied

The clay samples were supplied as core samples. Composite samples were prepared from the cores by taking small subsections sufficient to ensure that approximately 50% of the material was included within the sample.

The samples were ground in to a format that would be equivalent to a brick clay during use. This was taken as the primary bulk sample.

2.2 Particle Size Distribution

A representative sample of the clay powder was added to the wet dispersion unit of a Malvern Mastersizer 3000 running with water to which had been added an admixture to aid particle dispersion. The dispersion process was further aided by the use of the machines in-built ultrasound for a suitable period of time followed by a short period afterwards to allow the system to settle before taking particle size distribution readings.

2.3 Chemical Composition by XRF

A representative sample of each material was chemically analysed using X-ray fluorescence (XRF) analysis. This technique gives information concerning the chemical compositional make-up of the sample.

A fully quantitative mode was used on the sample, whereby the material was ground to a fine powder to homogenise it, then ignited at 1025 °C and then fused with lithium borate to form a homogenous glass bead. The analysis was performed on the bead using a Panalytical Axios wavelength dispersive XRF Spectrometer. The method used was in-house Method C201, which is based on BS EN ISO 12677:2011.

2.4 Total Carbon and Sulphur

Total carbon and sulphur in the clay samples were determined on a representative sub-sample of the material provided. The material is ground and homogenised and dried at 110 °C. The ground material is mixed with a catalyst and pyrolysed in a Leco Carbon Sulphur analyser. Carbon is converted to CO and CO₂, sulphur is converted to SO₂ and SO₃, the quantities of the resulting gases are determined using Infrared detection and converted to initial carbon and sulphur content.



2.5 Fired Appearance

Clay as received was wetted to form a thick clay mix, this was hand-pressed to form briquettes. Any visible organic debris was removed prior to pressing. These briquettes were air dried and then fired at 1060 °C to mimic a typical brick firing. The firing schedule was such that the heating stage was some seven hours with a 16 hour soak at temperature.

Once fired the briquettes were examined and photographed to assess the fired colour and body texture.

3 RESULTS & INTERPRETATION

3.1 Visual Examination of Clay Samples Supplied

The following was noted for each of the four clay samples submitted.

3.1.1 Borehole 1A & 1B Composite

The material was a silty clay with a greyish colour. Once wetted, the material was very plastic in nature. There was no obvious occurrence of entrained coarser mineral matter.

3.1.2 Borehole 1C & 1D Composite

The material was a silty clay with a greyish colour. Once wetted, the material was very plastic in nature. There was no obvious occurrence of entrained coarser mineral matter.

3.1.3 Borehole 5A & 5B Composite

The material was a silty clay with a greyish colour. Once wetted, the material was very plastic in nature. There was no obvious occurrence of entrained coarser mineral matter.

3.1.4 Borehole 5C & 5D Composite

The material was a silty clay with a greyish colour. Once wetted, the material was very plastic in nature. There was no obvious occurrence of entrained coarser mineral matter.

3.2 Particle Size Distribution

Particle size distribution was determined using Malvern laser particle sizing of the dispersed material. Samples were dispersed in water.

All the samples were found to be bimodal in size distribution with peaks at approximately 0.87 µm and 4.03 µm. For each sample the D₁₀, D₅₀ and D₉₀ values are provided along with the percentage of material exceeding 100 µm in size.

Results of particle sizing are tabulated below (Table 1), the full results are appended in the attached Appendices.

Table 1 – Particle Size Distribution Data Summary for Composite Samples

Reference	(173136)-23456	(173136)-23457	(173136)-23458	(173136)-23459
Mark	Borehole 1A & 1B Composite	Borehole 1C & 1D Composite	Borehole 5A & 5B Composite	Borehole 5C & 5D Composite
D ₁₀	1.20 µm	1.23 µm	1.14 µm	1.27 µm
D ₅₀	4.65 µm	5.10 µm	4.29 µm	5.36 µm
D ₉₀	21.1 µm	24.7 µm	15.2 µm	27.9 µm
Bimodal 1	0.87 µm	0.87 µm	0.87 µm	0.87 µm
Bimodal 2	4.03 µm	3.79 µm	4.03 µm	4.03 µm
% > 100 µm	0.73%	0.67%	0.31%	0.76%

3.3 Chemical Composition by XRF

Results of XRF analysis and loss on ignition at 1025°C to BS EN ISO 12677:2011 are tabulated below in Table 2 with the certificate of analysis reproduced in the Appendix.

Table 2 - XRF Composition of Clay Samples Provided

Reference	(173136)-23456	(173136)-23457	(173136)-23458	(173136)-23459
Mark	Borehole 1A & 1B Composite	Borehole 1C & 1D Composite	Borehole 5A & 5B Composite	Borehole 5C & 5D Composite
SiO ₂	60.25	55.73	53.43	63.35
TiO ₂	1.07	1.00	1.07	1.22
Al ₂ O ₃	20.15	17.38	21.26	18.24
Fe ₂ O ₃	7.15	8.76	9.05	6.30
CaO	4.67	2.75	1.37	0.65
MgO	1.54	1.22	1.37	0.95
K ₂ O	2.92	2.39	2.57	2.18
Na ₂ O	0.33	0.27	0.19	0.16
P ₂ O ₅	0.11	0.14	0.13	0.06
Cr ₂ O ₃	0.02	0.01	0.02	0.02
Mn ₃ O ₄	0.11	0.42	0.28	0.09
ZrO ₂	0.03	0.03	0.03	0.04
HfO ₂	< 0.01	< 0.01	< 0.01	< 0.01
PbO	< 0.02	< 0.02	0.04	< 0.02
ZnO	0.01	0.01	0.01	0.01
BaO	0.05	0.04	0.05	0.05
SrO	0.02	0.02	0.02	0.01
SnO ₂	< 0.01	< 0.01	< 0.01	< 0.01
CuO	0.01	< 0.01	0.01	< 0.01
Loss	0.92	9.09	9.09	6.12
Total	99.33	99.26	99.99	99.45
SO ₃	< 0.05	< 0.05	< 0.05	< 0.05

3.4 Total Carbon and Sulphur

Results of Leco total carbon and sulphur are tabulated below in Table 3 with the certificate of analysis reproduced in the Appendix.

Table 3 - Total Carbon and Sulphur Contents of Clay Samples Provided

Reference	(173136)-23456	(173136)-23457	(173136)-23458	(173136)-23459
Mark	Borehole 1A & 1B Composite	Borehole 1C & 1D Composite	Borehole 5A & 5B Composite	Borehole 5C & 5D Composite
Total C	0.98	1.29	1.02	0.34
Total S	0.04	0.05	0.12	0.16
Total S as SO ₃	0.11	0.13	0.31	0.39

3.5 Fired Appearance

The following observations were made before and after firing at 1060 °C. A firing temperature of 1060 °C was selected as this is typical of brick firing conditions. Briquettes were fired with a 16 hour soak time and allowed to cool slowly to avoid cracking. Briquettes were examined after drying and after firing.

3.5.1 Borehole 1A & 1B Composite

The unfired material (Figure 1) was a straw buff colour with a smooth even surface, indicative a fine particle size, free of coarse material. There was some evidence of cracking on drying of the material.

After firing (Figure 2), the briquette changed to a classic red brick coloured material. There was no evidence of any lime blow associated with the brick. Some white soluble salts were noted that were thought to be calcium sulphate based. The brick gave a sharp ring, indicative of a well bonded structure without significant cracking.

A freshly fractured face through the fired material showed that it was fairly dense with an even structure and moderate vitrification. The red colour indicated that the full oxidation of the structure had taken place during firing. The body contained dispersed white mineral fragments through the structure. The brick was strong with no observed shrinkage cracks.



Figure 1 - Composite Borehole Sample 1A + 1B Briquettes before Firing



Figure 2 - Composite Borehole Sample 1A + 1B Briquettes Post Firing

3.5.2 Borehole 1C & 1D Composite

The unfired material (Figure 3) was a brownish-buff colour with a slightly rough surface texture. Some cracking due to drying shrinkage was noted.

After firing (Figure 4), the briquette changed to a dark reddish-brown coloured material. There was no evidence of any lime blow associated with the brick. Some white soluble salts were noted that were thought to be calcium sulphate based. The brick gave a sharp ring, indicative of a well bonded structure without significant cracking.

Examination of a freshly fractured face through the fired material showed that it was very dense, with a significant glass content. The body was dark brown with black coloured particles within the body. The body would appear to have remained in a reduced state during firing. The body had very high strength due to the high degree of vitrification.



Figure 3 - Composite Borehole Sample 1C + 1D Briquettes before Firing



Figure 4 - Composite Borehole Sample 1C + 1D Briquettes after Firing

3.5.3 Borehole 5A & 5B Composite

The unfired material (Figure 5) was a greyish-buff colour with a slightly coarse textured surface. There was no evidence of cracking due to drying observed.

After firing (Figure 6), the briquette changed to a dark reddish-brown coloured material. There was no evidence of any lime blow associated with the brick. Some white soluble salts were noted that were thought to be calcium sulphate based. The brick gave a sharp ring, indicative of a well bonded structure without significant cracking.

A freshly fractured face through the fired material showed that the material was extremely dense and vitrified. The body colour was dark brown with a very dark core. The material was of high strength due to the degree of vitrification. The body structure appeared to be over-fired at 1060°C.



Figure 5 - Composite Borehole Sample 5A + 5B Briquettes before Firing



Figure 6 - Composite Borehole Sample 5A + 5B Briquettes after Firing

3.5.4 Borehole 5C & 5D Composite

The unfired material (Figure 7) was a greyish-buff colour with a smooth even surface. Some cracking due to drying shrinkage was noted.

After firing (Figure 8), the body became a reddish brown colour. There was no evidence of any lime blow associated with the brick. Some white soluble salts were noted that were thought to be calcium sulphate based. The brick gave a sharp ring, indicative of a well bonded structure without significant cracking.

Examination of a freshly fractured face through the fired material showed that it was a porous open structured material with a good degree of vitrification. The developed colour through the body was an even reddish brown indicating that it had been fully oxidised. The brick appeared to be of good strength.



Figure 7 - Composite Borehole Sample 5C + 5D Briquettes before Firing



Figure 8 - Composite Borehole Sample 5C + 5D Briquettes after Firing

4 CONCLUSIONS

The four composite core samples were of silty clay with a chemistry consistent with a brick clay.

On firing at 1060 °C, all the samples exhibited a change to a reddish brown. Two of the samples Core 1A & 1B and Core 5C & 5D were a classic brick red colour. The remaining two samples were significantly darker coloured.

The fired strength of the briquettes would appear to be sufficient for manufacture of bricks.

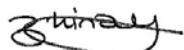
Upon firing, composite core samples 1B & 1C and 5A & 5B were darker in colour with an indication of black coring having taken place. The degree of vitrification was greater than for the other samples with noticeable over firing of samples 5A & 5B.

From the chemistry, the firing behaviour would appear to be the result of the greater concentrations of iron and manganese.

All samples exhibited a degree of soluble salt formation, presumably due to water soluble sulphate.

PHYSICAL TESTING ANALYSIS REPORT**Description:** Determination of Particle Size Distribution**Test Method:** In House Method PT55**Lucideon Reference:** (173136)-29481**Client:** Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT**For the Attention of:** Mr. Chris Williamson**Date Logged:** 13-Jul-2017**Date of Tests:** 29-Sep-2017 to 04-Oct-2017**Report Date:** 04-Oct-2017**Purchase Order No.:** CW/Loxwood

Please find attached the results for the sample(s) recently submitted for analysis.

**Miss Zoe Kinally**
Manager

Lucideon Analysis Report

Created by: burton
Last edited: 12/09/2017 09:04:53



Measurement Details

Sample Name (173136)-29481 Protreat Ltd - Loxwood Clay Pit - Borehole 1A & 1B Composite
Measurement Date Time 03/10/2017 16:50:22
Operator Name Burton
Analysis Date Time 04/10/2017 14:22:22
SOP File Name HydroEV.cfg
Result Source Edited

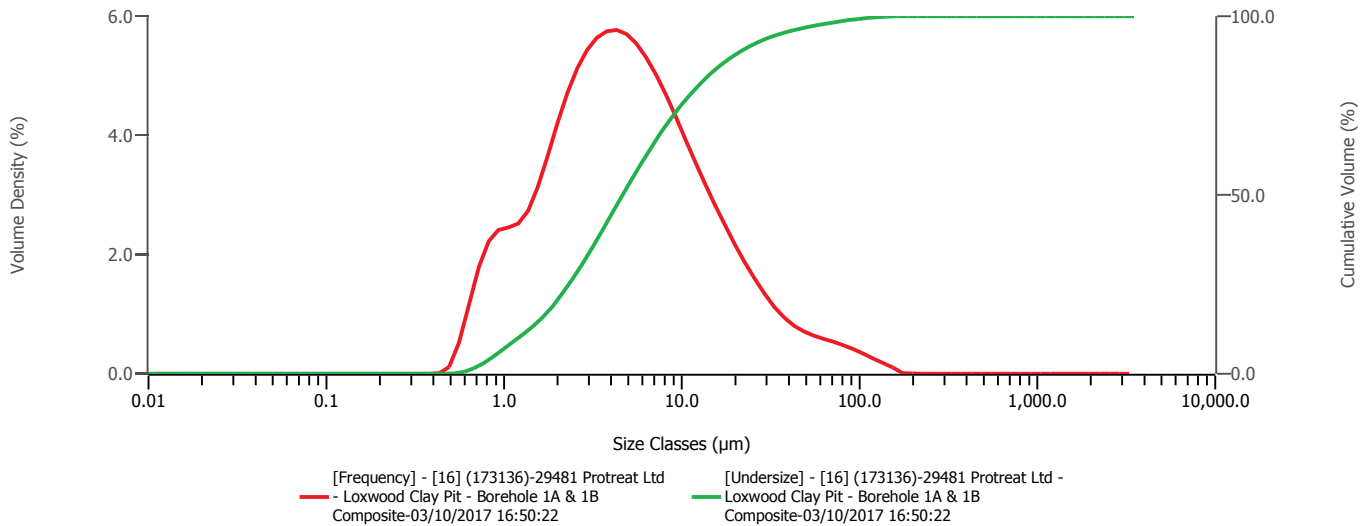
Analysis

Particle Name China Clay (RI 1.555)
Dispersant Name Water
Particle Absorption Index 0.100
Weighted Residual 1.17 %
Analysis Model General Purpose
Particle Refractive Index 1.555
Dispersant Refractive Index 1.330
Laser Obscuration 19.13 %
Scattering Model Mie
Analysis Sensitivity Normal

Result

Concentration 0.0080 %
Uniformity 1.565
Specific Surface Area 2014 m²/kg
D [3,2] 2.98 µm
D [4,3] 9.67 µm
Span 4.275
Result Units Volume
Dv (10) 1.20 µm
Dv (50) 4.65 µm
Dv (90) 21.1 µm

Frequency (compatible) and Undersize



Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under
0.0100	0.00	0.0876	0.00	0.767	2.95	6.72	63.31	58.9	97.59	516	100.00
0.0114	0.00	0.0995	0.00	0.872	4.82	7.64	67.50	66.9	98.08	586	100.00
0.0129	0.00	0.113	0.00	0.991	6.84	8.68	71.40	76.0	98.52	666	100.00
0.0147	0.00	0.128	0.00	1.13	8.89	9.86	74.99	86.4	98.92	756	100.00
0.0167	0.00	0.146	0.00	1.28	10.98	11.2	78.27	98.1	99.27	859	100.00
0.0189	0.00	0.166	0.00	1.45	13.25	12.7	81.22	111	99.55	976	100.00
0.0215	0.00	0.188	0.00	1.65	15.85	14.5	83.87	127	99.76	1110	100.00
0.0244	0.00	0.214	0.00	1.88	18.89	16.4	86.22	144	99.91	1260	100.00
0.0278	0.00	0.243	0.00	2.13	22.41	18.7	88.29	163	100.00	1430	100.00
0.0315	0.00	0.276	0.00	2.42	26.35	21.2	90.09	186	100.00	1630	100.00
0.0358	0.00	0.314	0.00	2.75	30.63	24.1	91.65	211	100.00	1850	100.00
0.0407	0.00	0.357	0.00	3.12	35.17	27.4	92.98	240	100.00	2100	100.00
0.0463	0.00	0.405	0.00	3.55	39.88	31.1	94.10	272	100.00	2390	100.00
0.0526	0.00	0.460	0.00	4.03	44.68	35.3	95.03	310	100.00	2710	100.00
0.0597	0.00	0.523	0.07	4.58	49.49	40.1	95.81	352	100.00	3080	100.00
0.0679	0.00	0.594	0.48	5.21	54.25	45.6	96.48	400	100.00	3500	100.00
0.0771	0.00	0.675	1.45	5.92	58.88	51.8	97.06	454	100.00		

Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.0679	0.00	0.460	0.07	3.12	4.71	21.2	1.56	144	0.09	976	0.00
0.0114	0.00	0.0771	0.00	0.523	0.42	3.55	4.80	24.1	1.33	163	0.00	1110	0.00
0.0129	0.00	0.0876	0.00	0.594	0.96	4.03	4.82	27.4	1.12	186	0.00	1260	0.00
0.0147	0.00	0.0995	0.00	0.675	1.50	4.58	4.76	31.1	0.93	211	0.00	1430	0.00
0.0167	0.00	0.113	0.00	0.767	1.87	5.21	4.63	35.3	0.78	240	0.00	1630	0.00
0.0189	0.00	0.128	0.00	0.872	2.02	5.92	4.43	40.1	0.67	272	0.00	1850	0.00
0.0215	0.00	0.146	0.00	0.991	2.05	6.72	4.19	45.6	0.59	310	0.00	2100	0.00
0.0244	0.00	0.166	0.00	1.13	2.09	7.64	3.90	51.8	0.53	352	0.00	2390	0.00
0.0278	0.00	0.188	0.00	1.28	2.27	8.68	3.59	58.9	0.49	400	0.00	2710	0.00
0.0315	0.00	0.214	0.00	1.45	2.60	9.86	3.28	66.9	0.45	454	0.00	3080	0.00
0.0358	0.00	0.243	0.00	1.65	3.04	11.2	2.96	76.0	0.40	516	0.00	3500	
0.0407	0.00	0.276	0.00	1.88	3.51	12.7	2.65	86.4	0.34	586	0.00		
0.0463	0.00	0.314	0.00	2.13	3.94	14.5	2.35	98.1	0.28	666	0.00		
0.0526	0.00	0.357	0.00	2.42	4.28	16.4	2.07	111	0.21	756	0.00		
0.0597	0.00	0.405	0.00	2.75	4.54	18.7	1.81	127	0.15	859	0.00		

PHYSICAL TESTING ANALYSIS REPORT

Description: Determination of Particle Size Distribution

Test Method: In House Method PT55

Lucideon Reference: (173136)-29482

Client: Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

For the Attention of: Mr. Chris Williamson

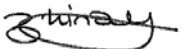
Date Logged: 13-Jul-2017

Date of Tests: 29-Sep-2017 to 04-Oct-2017

Report Date: 04-Oct-2017

Purchase Order No.: CW/Loxwood

Please find attached the results for the sample(s) recently submitted for analysis.



**Miss Zoe Kinally
Manager**

Lucideon Analysis Report

Created by: burton
Last edited: 12/09/2017 09:04:53



Measurement Details

Sample Name (173136)-29482 Protreat Ltd - Loxwood Clay Pit - Borehole 1C & 1D Composite
Measurement Date Time 04/10/2017 10:03:25
Operator Name Burton
Analysis Date Time 04/10/2017 14:25:29
SOP File Name HydroEV.cfg
Result Source Edited

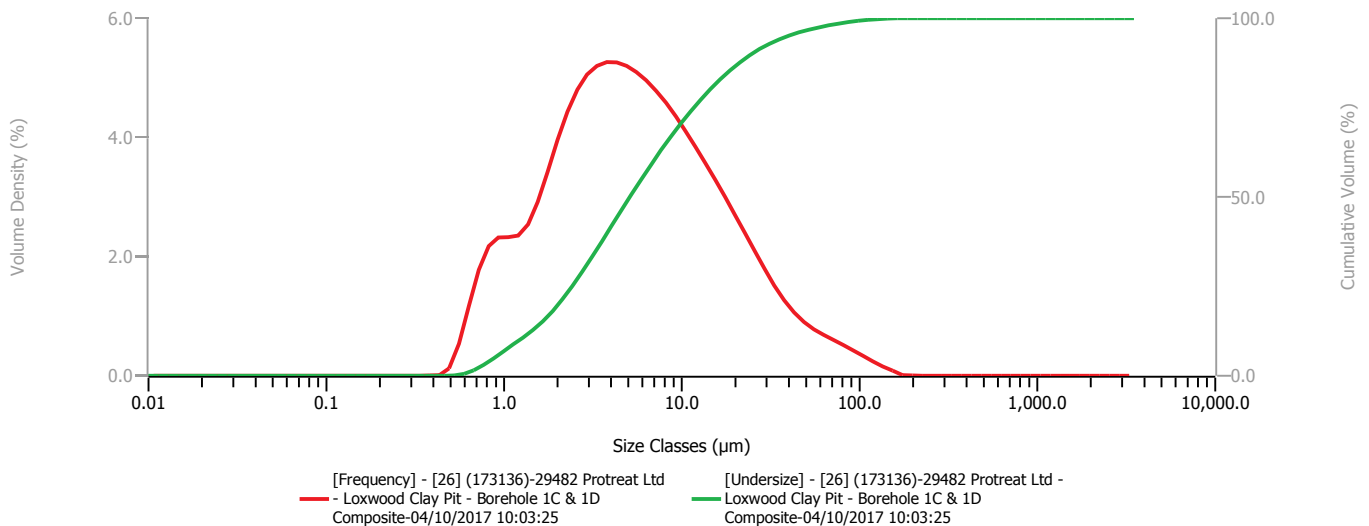
Analysis

Particle Name China Clay (RI 1.555)
Dispersant Name Water
Particle Absorption Index 0.100
Weighted Residual 1.21 %
Analysis Model General Purpose
Particle Refractive Index 1.555
Dispersant Refractive Index 1.330
Laser Obscuration 16.31 %
Scattering Model Mie
Analysis Sensitivity Normal

Result

Concentration 0.0070 %
Uniformity 1.589
Specific Surface Area 1930 m²/kg
D [3,2] 3.11 µm
D [4,3] 10.6 µm
Span 4.609
Result Units Volume
Dv (10) 1.23 µm
Dv (50) 5.10 µm
Dv (90) 24.7 µm

Frequency (compatible) and Undersize



Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under
0.0100	0.00	0.0876	0.00	0.767	2.98	6.72	59.11	58.9	97.47	516	100.00
0.0114	0.00	0.0995	0.00	0.872	4.81	7.64	63.10	66.9	98.04	586	100.00
0.0129	0.00	0.113	0.00	0.991	6.76	8.68	66.93	76.0	98.54	666	100.00
0.0147	0.00	0.128	0.00	1.13	8.69	9.86	70.55	86.4	98.97	756	100.00
0.0167	0.00	0.146	0.00	1.28	10.64	11.2	73.98	98.1	99.33	859	100.00
0.0189	0.00	0.166	0.00	1.45	12.75	12.7	77.18	111	99.60	976	100.00
0.0215	0.00	0.188	0.00	1.65	15.17	14.5	80.15	127	99.80	1110	100.00
0.0244	0.00	0.214	0.00	1.88	18.02	16.4	82.89	144	99.93	1260	100.00
0.0278	0.00	0.243	0.00	2.13	21.32	18.7	85.40	163	100.00	1430	100.00
0.0315	0.00	0.276	0.00	2.42	25.03	21.2	87.65	186	100.00	1630	100.00
0.0358	0.00	0.314	0.00	2.75	29.04	24.1	89.65	211	100.00	1850	100.00
0.0407	0.00	0.357	0.00	3.12	33.26	27.4	91.39	240	100.00	2100	100.00
0.0463	0.00	0.405	0.00	3.55	37.60	31.1	92.89	272	100.00	2390	100.00
0.0526	0.00	0.460	0.00	4.03	42.00	35.3	94.15	310	100.00	2710	100.00
0.0597	0.00	0.523	0.08	4.58	46.39	40.1	95.20	352	100.00	3080	100.00
0.0679	0.00	0.594	0.51	5.21	50.73	45.6	96.08	400	100.00	3500	100.00
0.0771	0.00	0.675	1.48	5.92	54.98	51.8	96.83	454	100.00		



Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.0679	0.00	0.460	0.08	3.12	4.34	21.2	2.00	144	0.07
0.0114	0.00	0.0771	0.00	0.523	0.43	3.55	4.39	24.1	1.74	163	0.00
0.0129	0.00	0.0876	0.00	0.594	0.98	4.03	4.39	27.4	1.49	186	0.00
0.0147	0.00	0.0995	0.00	0.675	1.50	4.58	4.34	31.1	1.26	211	0.00
0.0167	0.00	0.113	0.00	0.767	1.83	5.21	4.25	35.3	1.05	240	0.00
0.0189	0.00	0.128	0.00	0.872	1.95	5.92	4.13	40.1	0.88	272	0.00
0.0215	0.00	0.146	0.00	0.991	1.93	6.72	3.99	45.6	0.75	310	0.00
0.0244	0.00	0.166	0.00	1.13	1.95	7.64	3.82	51.8	0.65	352	0.00
0.0278	0.00	0.188	0.00	1.28	2.10	8.68	3.63	58.9	0.57	400	0.00
0.0315	0.00	0.214	0.00	1.45	2.42	9.86	3.42	66.9	0.50	454	0.00
0.0358	0.00	0.243	0.00	1.65	2.85	11.2	3.20	76.0	0.43	516	0.00
0.0407	0.00	0.276	0.00	1.88	3.30	12.7	2.97	86.4	0.35	586	0.00
0.0463	0.00	0.314	0.00	2.13	3.70	14.5	2.74	98.1	0.27	666	0.00
0.0526	0.00	0.357	0.00	2.42	4.01	16.4	2.50	111	0.20	756	0.00
0.0597	0.00	0.405	0.00	2.75	4.22	18.7	2.25	127	0.13	859	0.00
										976	0.00
										1110	0.00
										1260	0.00
										1430	0.00
										1630	0.00
										1850	0.00
										2100	0.00
										2390	0.00
										2710	0.00
										3080	0.00
										3500	

PHYSICAL TESTING ANALYSIS REPORT

Description: Determination of Particle Size Distribution

Test Method: In House Method PT55

Lucideon Reference: (173136)-29483

Client: Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

For the Attention of: Mr. Chris Williamson

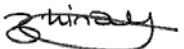
Date Logged: 13-Jul-2017

Date of Tests: 29-Sep-2017 to 04-Oct-2017

Report Date: 04-Oct-2017

Purchase Order No.: CW/Loxwood

Please find attached the results for the sample(s) recently submitted for analysis.



**Miss Zoe Kinally
Manager**

Lucideon Analysis Report

Created by: burton
Last edited: 12/09/2017 09:04:53



Measurement Details

Sample Name (173136)-29483 Protreat Ltd - Loxwood Clay Pit - Borehole 5A & 5B Composite
Measurement Date Time 04/10/2017 11:23:58
Operator Name Burton
Analysis Date Time 04/10/2017 14:29:51
SOP File Name HydroEV.cfg
Result Source Edited

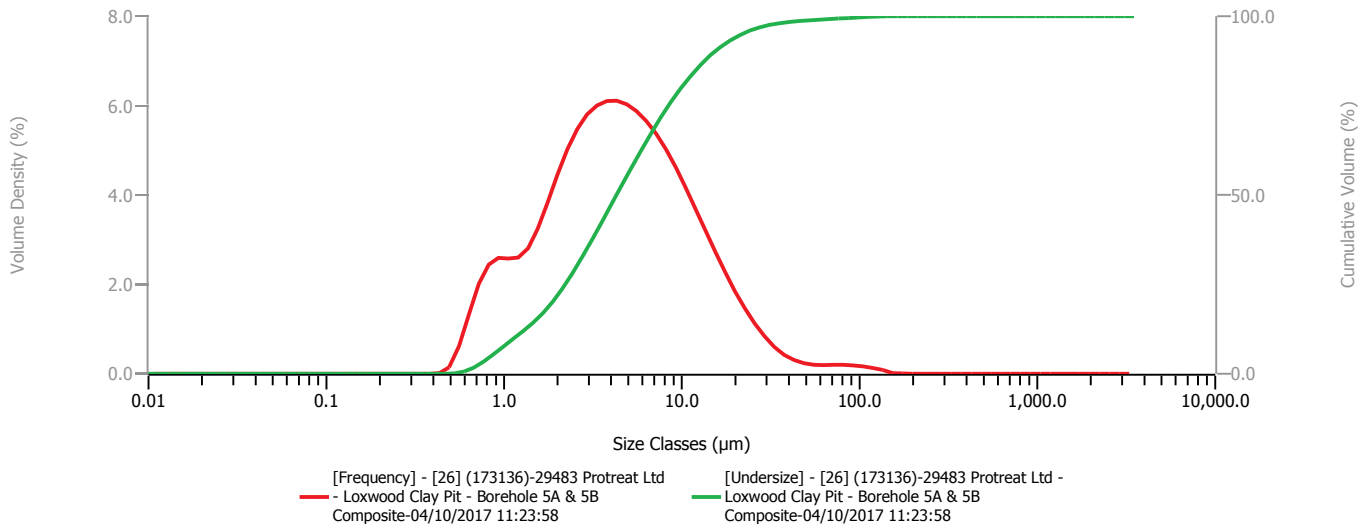
Analysis

Particle Name China Clay (RI 1.555)
Dispersant Name Water
Particle Absorption Index 0.100
Weighted Residual 1.35 %
Analysis Model General Purpose
Particle Refractive Index 1.555
Dispersant Refractive Index 1.330
Laser Obscuration 16.19 %
Scattering Model Mie
Analysis Sensitivity Normal

Result

Concentration 0.0062 %
Uniformity 1.179
Specific Surface Area 2146 m²/kg
D [3,2] 2.80 µm
D [4,3] 7.32 µm
Span 3.288
Result Units Volume
Dv (10) 1.14 µm
Dv (50) 4.29 µm
Dv (90) 15.2 µm

Frequency (compatible) and Undersize



Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under
0.0100	0.00	0.0876	0.00	0.767	3.38	6.72	67.32	58.9	99.04	516	100.00
0.0114	0.00	0.0995	0.00	0.872	5.44	7.64	71.80	66.9	99.20	586	100.00
0.0129	0.00	0.113	0.00	0.991	7.61	8.68	75.99	76.0	99.37	666	100.00
0.0147	0.00	0.128	0.00	1.13	9.75	9.86	79.84	86.4	99.53	756	100.00
0.0167	0.00	0.146	0.00	1.28	11.90	11.2	83.31	98.1	99.69	859	100.00
0.0189	0.00	0.166	0.00	1.45	14.23	12.7	86.39	111	99.82	976	100.00
0.0215	0.00	0.188	0.00	1.65	16.92	14.5	89.06	127	99.93	1110	100.00
0.0244	0.00	0.214	0.00	1.88	20.11	16.4	91.33	144	100.00	1260	100.00
0.0278	0.00	0.243	0.00	2.13	23.83	18.7	93.22	163	100.00	1430	100.00
0.0315	0.00	0.276	0.00	2.42	28.03	21.2	94.76	186	100.00	1630	100.00
0.0358	0.00	0.314	0.00	2.75	32.61	24.1	95.98	211	100.00	1850	100.00
0.0407	0.00	0.357	0.00	3.12	37.46	27.4	96.91	240	100.00	2100	100.00
0.0463	0.00	0.405	0.00	3.55	42.47	31.1	97.60	272	100.00	2390	100.00
0.0526	0.00	0.460	0.00	4.03	47.56	35.3	98.09	310	100.00	2710	100.00
0.0597	0.00	0.523	0.09	4.58	52.66	40.1	98.44	352	100.00	3080	100.00
0.0679	0.00	0.594	0.58	5.21	57.69	45.6	98.69	400	100.00	3500	100.00
0.0771	0.00	0.675	1.69	5.92	62.60	51.8	98.88	454	100.00		

Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.0679	0.00	0.460	0.09	3.12	5.01	21.2	1.22	144	0.00	976	0.00
0.0114	0.00	0.0771	0.00	0.523	0.49	3.55	5.09	24.1	0.93	163	0.00	1110	0.00
0.0129	0.00	0.0876	0.00	0.594	1.11	4.03	5.10	27.4	0.69	186	0.00	1260	0.00
0.0147	0.00	0.0995	0.00	0.675	1.69	4.58	5.03	31.1	0.49	211	0.00	1430	0.00
0.0167	0.00	0.113	0.00	0.767	2.06	5.21	4.91	35.3	0.35	240	0.00	1630	0.00
0.0189	0.00	0.128	0.00	0.872	2.17	5.92	4.72	40.1	0.25	272	0.00	1850	0.00
0.0215	0.00	0.146	0.00	0.991	2.14	6.72	4.48	45.6	0.19	310	0.00	2100	0.00
0.0244	0.00	0.166	0.00	1.13	2.15	7.64	4.19	51.8	0.16	352	0.00	2390	0.00
0.0278	0.00	0.188	0.00	1.28	2.32	8.68	3.85	58.9	0.16	400	0.00	2710	0.00
0.0315	0.00	0.214	0.00	1.45	2.69	9.86	3.47	66.9	0.16	454	0.00	3080	0.00
0.0358	0.00	0.243	0.00	1.65	3.19	11.2	3.08	76.0	0.16	516	0.00	3500	
0.0407	0.00	0.276	0.00	1.88	3.72	12.7	2.67	86.4	0.15	586	0.00		
0.0463	0.00	0.314	0.00	2.13	4.20	14.5	2.27	98.1	0.14	666	0.00		
0.0526	0.00	0.357	0.00	2.42	4.58	16.4	1.89	111	0.11	756	0.00		
0.0597	0.00	0.405	0.00	2.75	4.85	18.7	1.54	127	0.07	859	0.00		

PHYSICAL TESTING ANALYSIS REPORT

Description: Determination of Particle Size Distribution

Test Method: In House Method PT55

Lucideon Reference: (173136)-29484

Client: Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

For the Attention of: Mr. Chris Williamson

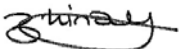
Date Logged: 13-Jul-2017

Date of Tests: 29-Sep-2017 to 04-Oct-2017

Report Date: 04-Oct-2017

Purchase Order No.: CW/Loxwood

Please find attached the results for the sample(s) recently submitted for analysis.



Miss Zoe Kinally
Manager

Lucideon Analysis Report

Created by: burton
Last edited: 12/09/2017 09:04:53



Measurement Details

Sample Name (173136)-29484 Protreat Ltd - Loxwood Clay Pit - Borehole 5C & 5D Composite
Measurement Date Time 04/10/2017 12:19:04
Operator Name Burton
Analysis Date Time 04/10/2017 14:31:39
SOP File Name HydroEV.cfg
Result Source Edited

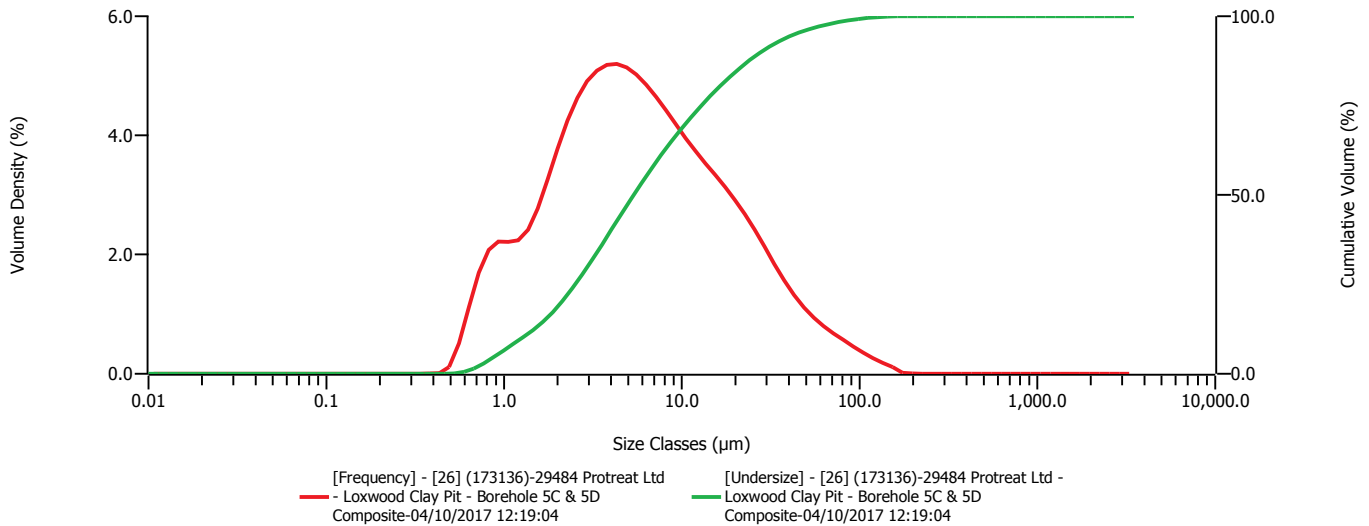
Analysis

Particle Name China Clay (RI 1.555)
Dispersant Name Water
Particle Absorption Index 0.100
Weighted Residual 1.18 %
Analysis Model General Purpose
Particle Refractive Index 1.555
Dispersant Refractive Index 1.330
Laser Obscuration 18.51 %
Scattering Model Mie
Analysis Sensitivity Normal

Result

Concentration 0.0083 %
Uniformity 1.652
Specific Surface Area 1862 m²/kg
D [3,2] 3.22 µm
D [4,3] 11.5 µm
Span 4.959
Result Units Volume
Dv (10) 1.27 µm
Dv (50) 5.36 µm
Dv (90) 27.9 µm

Frequency (compatible) and Undersize



Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under	Size (µm)	% Volume Under
0.0100	0.00	0.0876	0.00	0.767	2.84	6.72	57.27	58.9	97.17	516	100.00
0.0114	0.00	0.0995	0.00	0.872	4.59	7.64	61.15	66.9	97.83	586	100.00
0.0129	0.00	0.113	0.00	0.991	6.45	8.68	64.84	76.0	98.39	666	100.00
0.0147	0.00	0.128	0.00	1.13	8.29	9.86	68.33	86.4	98.86	756	100.00
0.0167	0.00	0.146	0.00	1.28	10.14	11.2	71.62	98.1	99.24	859	100.00
0.0189	0.00	0.166	0.00	1.45	12.14	12.7	74.74	111	99.54	976	100.00
0.0215	0.00	0.188	0.00	1.65	14.45	14.5	77.68	127	99.76	1110	100.00
0.0244	0.00	0.214	0.00	1.88	17.16	16.4	80.46	144	99.90	1260	100.00
0.0278	0.00	0.243	0.00	2.13	20.31	18.7	83.07	163	100.00	1430	100.00
0.0315	0.00	0.276	0.00	2.42	23.86	21.2	85.51	186	100.00	1630	100.00
0.0358	0.00	0.314	0.00	2.75	27.73	24.1	87.74	211	100.00	1850	100.00
0.0407	0.00	0.357	0.00	3.12	31.83	27.4	89.76	240	100.00	2100	100.00
0.0463	0.00	0.405	0.00	3.55	36.08	31.1	91.53	272	100.00	2390	100.00
0.0526	0.00	0.460	0.00	4.03	40.41	35.3	93.07	310	100.00	2710	100.00
0.0597	0.00	0.523	0.07	4.58	44.75	40.1	94.37	352	100.00	3080	100.00
0.0679	0.00	0.594	0.48	5.21	49.04	45.6	95.46	400	100.00	3500	100.00
0.0771	0.00	0.675	1.41	5.92	53.23	51.8	96.39	454	100.00		

Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In	Size (µm)	% Volume In
0.0100	0.00	0.0679	0.00	0.460	0.07	3.12	4.25	21.2	2.24	144	0.09
0.0114	0.00	0.0771	0.00	0.523	0.41	3.55	4.33	24.1	2.01	163	0.00
0.0129	0.00	0.0876	0.00	0.594	0.93	4.03	4.34	27.4	1.78	186	0.00
0.0147	0.00	0.0995	0.00	0.675	1.43	4.58	4.29	31.1	1.53	211	0.00
0.0167	0.00	0.113	0.00	0.767	1.75	5.21	4.19	35.3	1.30	240	0.00
0.0189	0.00	0.128	0.00	0.872	1.86	5.92	4.05	40.1	1.10	272	0.00
0.0215	0.00	0.146	0.00	0.991	1.84	6.72	3.88	45.6	0.92	310	0.00
0.0244	0.00	0.166	0.00	1.13	1.85	7.64	3.69	51.8	0.78	352	0.00
0.0278	0.00	0.188	0.00	1.28	2.00	8.68	3.49	58.9	0.66	400	0.00
0.0315	0.00	0.214	0.00	1.45	2.30	9.86	3.30	66.9	0.56	454	0.00
0.0358	0.00	0.243	0.00	1.65	2.71	11.2	3.12	76.0	0.47	516	0.00
0.0407	0.00	0.276	0.00	1.88	3.15	12.7	2.94	86.4	0.38	586	0.00
0.0463	0.00	0.314	0.00	2.13	3.55	14.5	2.78	98.1	0.29	666	0.00
0.0526	0.00	0.357	0.00	2.42	3.87	16.4	2.61	111	0.22	756	0.00
0.0597	0.00	0.405	0.00	2.75	4.10	18.7	2.43	127	0.15	859	0.00
										976	0.00
										1110	0.00
										1260	0.00
										1430	0.00
										1630	0.00
										1850	0.00
										2100	0.00
										2390	0.00
										2710	0.00
										3080	0.00
										3500	

INORGANIC ANALYSIS REPORT

LUCIDEON

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0013

Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

FAO: Mr. Chris Williamson

Report of Tests on: Loxwood Clay Pit

Your Reference: Borehole 1A & 1B Composite

Lucideon Reference: (173136)-29481

Date Reported: 19-Sep-2017

Order Number: CW/Loxwood

Date Logged: 13-Jul-2017

Date(s) of Test(s): 15-Sep-2017 to 16-Sep-2017

Determination of Total Carbon and Total Sulphur

Method C45

Result(s)		Units	
Total Carbon	C	%	0.98
Sulphur, Total	S	%	0.04
Sulphur, Total	SO ₃	%	0.11
Mean of Duplicate Determinations			Yes
Sample Basis			Dried 110 deg C
UKAS Accredited			Yes

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

End of Test Report

Mrs Maxine Bowker
Technician

This report is issued in accordance with the Conditions of Business of Lucideon Limited and relates only to the sample(s) tested. No responsibility is taken for the accuracy of the sampling unless this is done under our own supervision. This report shall not be reproduced in part without the written approval of Lucideon Limited, nor used in any way as to lead to misrepresentation of the results or their implications.

Lucideon is the trading name of Lucideon Limited. Registered in England No. 1960455.

Lucideon Limited
Queens Road, Penkull
Stoke-on-Trent
Staffordshire ST4 7LQ

T +44 (0)1782 764428
enquiries@lucideon.com
www.lucideon.com

INORGANIC ANALYSIS REPORT

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0013

Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

FAO: Mr. Chris Williamson

Report of Tests on: Loxwood Clay Pit

Your Reference: Borehole 1C & 1D Composite

Lucideon Reference: (173136)-29482

Date Reported: 19-Sep-2017

Order Number: CW/Loxwood

Date Logged: 13-Jul-2017

Date(s) of Test(s): 15-Sep-2017 to 16-Sep-2017

Determination of Total Carbon and Total Sulphur

Method C45

Result(s)		Units	
Total Carbon	C	%	1.29
Sulphur, Total	S	%	0.05
Sulphur, Total	SO ₃	%	0.13
Mean of Duplicate Determinations			Yes
Sample Basis			Dried 110 deg C
UKAS Accredited			Yes

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

End of Test Report

Mrs Maxine Bowker
Technician

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enquiries@lucideon.com
www.lucideon.com

INORGANIC ANALYSIS REPORT

LUCIDEON

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0013

Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

FAO: Mr. Chris Williamson

Report of Tests on: Loxwood Clay Pit

Your Reference: Borehole 5A & 5B Composite

Lucideon Reference: (173136)-29483

Date Reported: 19-Sep-2017

Order Number: CW/Loxwood

Date Logged: 13-Jul-2017

Date(s) of Test(s): 15-Sep-2017 to 16-Sep-2017

Determination of Total Carbon and Total Sulphur

Method C45

Result(s)		Units	
Total Carbon	C	%	1.02
Sulphur, Total	S	%	0.12
Sulphur, Total	SO ₃	%	0.31
Mean of Duplicate Determinations			Yes
Sample Basis			Dried 110 deg C
UKAS Accredited			Yes

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

End of Test Report

Mrs Maxine Bowker
Technician

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INORGANIC ANALYSIS REPORT

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0013

Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

FAO: Mr. Chris Williamson

Report of Tests on: Loxwood Clay Pit

Your Reference: Borehole 5C & 5D Composite

Lucideon Reference: (173136)-29484

Date Reported: 19-Sep-2017

Order Number: CW/Loxwood

Date Logged: 13-Jul-2017

Date(s) of Test(s): 15-Sep-2017 to 16-Sep-2017

Determination of Total Carbon and Total Sulphur

Method C45

Result(s)		Units	
Total Carbon	C	%	0.34
Sulphur, Total	S	%	0.16
Sulphur, Total	SO ₃	%	0.39
Mean of Duplicate Determinations			Yes
Sample Basis			Dried 110 deg C
UKAS Accredited			Yes

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

End of Test Report

Mrs Maxine Bowker
Technician

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INORGANIC ANALYSIS REPORT

LUCIDEON

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0013

Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

FAO: Mr. Chris Williamson

Report of Tests on: Loxwood Clay Pit

Your Reference: Borehole 1A & 1B Composite

Lucideon Reference: (173136)-29481

Date Reported: 20-Sep-2017

Order Number: CW/Loxwood

Date Logged: 13-Jul-2017

Date(s) of Test(s): 19-Sep-2017 to 19-Sep-2017

XRF Analysis

Methods C201 based on BSEN ISO 12677:2011

Result(s)		Units	
Sample Basis			Dried 110 deg C
Silicon Dioxide	SiO ₂	%	60.25
Titanium Dioxide	TiO ₂	%	1.07
Aluminium Oxide	Al ₂ O ₃	%	20.15
Iron (III) Oxide	Fe ₂ O ₃	%	7.12
Calcium Oxide	CaO	%	4.67
Magnesium Oxide	MgO	%	1.54
Potassium Oxide	K ₂ O	%	2.92
Sodium Oxide	Na ₂ O	%	0.33
Phosphorus Pentoxide	P ₂ O ₅	%	0.11
Chromium (III) Oxide	Cr ₂ O ₃	%	0.02
Manganese (II,III) Oxide	Mn ₃ O ₄	%	0.11
Zirconium Oxide	ZrO ₂	%	0.03
Hafnium (IV) Oxide	HfO ₂	%	<0.01
Lead Oxide	PbO	%	<0.02
Zinc Oxide	ZnO	%	0.01
Barium Oxide	BaO	%	0.05
Strontium (II) Oxide	SrO	%	0.02
Tin (IV) Oxide	SnO ₂	%	<0.01
Copper Oxide	CuO	%	0.01
Loss on Ignition		%	0.92
Loss on Ignition Temperature		°C	1025
Total		%	99.33
Sulphur Trioxide	SO ₃	%	<0.05
UKAS Accredited			Yes

The sulphur trioxide may not be a total sulphur figure but is the sulphur remaining after LOI and fusion. Results are quoted to 2 decimal places but are accurate to 3 significant figures or the number of figures given, whichever is the lesser.

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

End of Test Report

C.E. Askey

Miss Clare Askey
Technician

Page 1 of 1

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INORGANIC ANALYSIS REPORT

LUCIDEON

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0013

Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

FAO: Mr. Chris Williamson

Report of Tests on: Loxwood Clay Pit

Your Reference: Borehole 1C & 1D Composite

Lucideon Reference: (173136)-29482

Date Reported: 20-Sep-2017

Order Number: CW/Loxwood

Date Logged: 13-Jul-2017

Date(s) of Test(s): 19-Sep-2017 to 19-Sep-2017

XRF Analysis

Methods C201 based on BSEN ISO 12677:2011

Result(s)		Units	
Sample Basis			Dried 110 deg C
Silicon Dioxide	SiO ₂	%	55.73
Titanium Dioxide	TiO ₂	%	1.00
Aluminium Oxide	Al ₂ O ₃	%	17.38
Iron (III) Oxide	Fe ₂ O ₃	%	8.76
Calcium Oxide	CaO	%	2.75
Magnesium Oxide	MgO	%	1.22
Potassium Oxide	K ₂ O	%	2.39
Sodium Oxide	Na ₂ O	%	0.27
Phosphorus Pentoxide	P ₂ O ₅	%	0.14
Chromium (III) Oxide	Cr ₂ O ₃	%	0.01
Manganese (II,III) Oxide	Mn ₃ O ₄	%	0.42
Zirconium Oxide	ZrO ₂	%	0.03
Hafnium (IV) Oxide	HfO ₂	%	<0.01
Lead Oxide	PbO	%	<0.02
Zinc Oxide	ZnO	%	0.01
Barium Oxide	BaO	%	0.04
Strontium (II) Oxide	SrO	%	0.02
Tin (IV) Oxide	SnO ₂	%	<0.01
Copper Oxide	CuO	%	<0.01
Loss on Ignition		%	9.09
Loss on Ignition Temperature		°C	1025
Total		%	99.26
Sulphur Trioxide	SO ₃	%	<0.05
UKAS Accredited			Yes

The sulphur trioxide may not be a total sulphur figure but is the sulphur remaining after LOI and fusion. Results are quoted to 2 decimal places but are accurate to 3 significant figures or the number of figures given, whichever is the lesser.

Opinions and interpretations expressed herein are outside the scope of UKAS Accreditation.

End of Test Report

C.E. Askey

Miss Clare Askey
Technician

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Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

FAO: Mr. Chris Williamson

Report of Tests on: Loxwood Clay Pit

Your Reference: Borehole 5A & 5B Composite

Lucideon Reference: (173136)-29483

Date Reported: 20-Sep-2017

Order Number: CW/Loxwood

Date Logged: 13-Jul-2017

Date(s) of Test(s): 19-Sep-2017 to 19-Sep-2017

XRF Analysis

Methods C201 based on BSEN ISO 12677:2011

Result(s)		Units	
Sample Basis			Dried 110 deg C
Silicon Dioxide	SiO ₂	%	53.43
Titanium Dioxide	TiO ₂	%	1.07
Aluminium Oxide	Al ₂ O ₃	%	21.26
Iron (III) Oxide	Fe ₂ O ₃	%	9.05
Calcium Oxide	CaO	%	1.37
Magnesium Oxide	MgO	%	1.37
Potassium Oxide	K ₂ O	%	2.57
Sodium Oxide	Na ₂ O	%	0.19
Phosphorus Pentoxide	P ₂ O ₅	%	0.13
Chromium (III) Oxide	Cr ₂ O ₃	%	0.02
Manganese (II,III) Oxide	Mn ₃ O ₄	%	0.28
Zirconium Oxide	ZrO ₂	%	0.03
Hafnium (IV) Oxide	HfO ₂	%	<0.01
Lead Oxide	PbO	%	0.04
Zinc Oxide	ZnO	%	0.01
Barium Oxide	BaO	%	0.05
Strontium (II) Oxide	SrO	%	0.02
Tin (IV) Oxide	SnO ₂	%	<0.01
Copper Oxide	CuO	%	0.01
Loss on Ignition		%	9.09
Loss on Ignition Temperature		°C	1025
Total		%	99.99
Sulphur Trioxide	SO ₃	%	<0.05
UKAS Accredited			Yes

The sulphur trioxide may not be a total sulphur figure but is the sulphur remaining after LOI and fusion. Results are quoted to 2 decimal places but are accurate to 3 significant figures or the number of figures given, whichever is the lesser.

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End of Test Report

C.E. Askey

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Lockwood Clay Pits Ltd
c/o Protreat Ltd
33 High Street
Newport
Shropshire
TF10 7AT

FAO: Mr. Chris Williamson

Report of Tests on: Loxwood Clay Pit

Your Reference: Borehole 5C & 5D Composite

Lucideon Reference: (173136)-29484

Date Reported: 20-Sep-2017

Order Number: CW/Loxwood

Date Logged: 13-Jul-2017

Date(s) of Test(s): 19-Sep-2017 to 19-Sep-2017

XRF Analysis

Methods C201 based on BSEN ISO 12677:2011

Result(s)		Units	
Sample Basis			Dried 110 deg C
Silicon Dioxide	SiO ₂	%	63.35
Titanium Dioxide	TiO ₂	%	1.22
Aluminium Oxide	Al ₂ O ₃	%	18.24
Iron (III) Oxide	Fe ₂ O ₃	%	6.30
Calcium Oxide	CaO	%	0.65
Magnesium Oxide	MgO	%	0.95
Potassium Oxide	K ₂ O	%	2.18
Sodium Oxide	Na ₂ O	%	0.16
Phosphorus Pentoxide	P ₂ O ₅	%	0.06
Chromium (III) Oxide	Cr ₂ O ₃	%	0.02
Manganese (II,III) Oxide	Mn ₃ O ₄	%	0.09
Zirconium Oxide	ZrO ₂	%	0.04
Hafnium (IV) Oxide	HfO ₂	%	<0.01
Lead Oxide	PbO	%	<0.02
Zinc Oxide	ZnO	%	0.01
Barium Oxide	BaO	%	0.05
Strontium (II) Oxide	SrO	%	0.01
Tin (IV) Oxide	SnO ₂	%	<0.01
Copper Oxide	CuO	%	<0.01
Loss on Ignition		%	6.12
Loss on Ignition Temperature		°C	1025
Total		%	99.45
Sulphur Trioxide	SO ₃	%	0.05
UKAS Accredited			Yes

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End of Test Report

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