

[REDACTED]

From: Michael Eastham
Sent: 24 December 2021 16:49
To: Planning Scanning
Subject: FW: BN/118/21/DOC - Land At Angels Nursery, Yapton Road, Barnham - CONTAMINATED LAND REPORT
Attachments: 44161--1.PDF

[REDACTED]

Thanks,

Michael

From: Tilly Whishaw [REDACTED]
Sent: 13 December 2021 11:10
To: Michael Eastham [REDACTED], Craig Burden [REDACTED]
Cc: Kate Giddings [REDACTED]
Subject: RE: BN/118/21/DOC - Land At Angels Nursery, Yapton Road, Barnham - CONTAMINATED LAND REPORT

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Dear Michael,

Please see the summary of the SI information attached as discussed.

I trust this provides the Council with the additional information required for the discharge of this condition, however if you need any further information please let me know.

Kind regards,

Tilly

Tilly Whishaw
Planning Manager

Redrow Homes Limited
Redrow House Unit 1 Faraday Office Park
Rankine Road, Basingstoke
Hampshire, RG24 8QB

[REDACTED]



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Think before you print

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Mitchell Garrington
Redrow Homes
Faraday Office Park
Basingstoke
Hampshire
RG24 8QQ

CAT/RAN/44161-012

13 December 2021

Dear Mitchell,

Barnham, Windmill Views: Summary of SI information

Eastwood & Partners were requested to provide a summary of the site investigation undertaken to date and the how the resulting remedial recommendations have evolved over time following the findings of these.

In July 2019 E&P were provided with copies of the following Geo-Environmental Services Ltd (GES) reports:

- Ground Investigation Report, reference GE10423-GIR-SEP15, dated 10 September 2015; and
- Remediation Method Statement, reference GE15163-RMS-DEC15, dated 10 December 2015.

E&P undertook a review of these reports which was presented in our letter referenced CAT/RAN/44161-001, dated 8 July 2019, a copy of which is enclosed. This concluded the following with regards to the remedial measures proposed by GES:

'Geo-Environmental suggested that this [the clean capping layer in gardens] will need to comprise 300 mm of clean and physically suitable topsoil and 300 mm of clean and physically suitable subsoil in areas of existing physically and chemically unsuitable soil. This is currently estimated to cover over 50% of the site, based on the description of soil in the exploratory hole logs, as well as an aerial photograph of the site dated 2015 which shows a large proportion of the surface soil across the site to have been disturbed. Further intrusive investigation and chemical testing may enable both the affected area, and the thickness of the capping layer to be reduced.'

Therefore, following these recommendations Redrow Homes commissioned E&P to undertake additional intrusive investigation across the site, including testing of additional soil

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samples from across the site. This additional investigation was subsequently reported in our letter referenced CAT/RAN/44161-003, dated 28 February 2020, a copy of which is enclosed.

Based on the results of the additional investigation this letter concluded that:

- Topsoil was chemically suitable for re-use at the site, however it was noted that potentially injurious deleterious material was encountered in the topsoil in some locations and therefore recommended that the topsoil was stripped and screened prior to re-use.
- Made ground was suitable to remain below the topsoil in garden and landscaped areas, as levels were to be raised by a minimum of 300 mm, giving at least 450 mm of cover. It was also noted that any potentially injurious material should be removed from the made ground by hand picking, if found to be present.

No formal capping layer was therefore proposed following the completion of this additional investigation.

Subsequently, the NHBC raised concerns over the practicality of screening the topsoil to remove deleterious material, and instead it was agreed that a permeable membrane would be laid over unsuitable topsoil and this could then be topped with 450 mm of approved topsoil as part of the raising of levels. In September 2020 we were made aware of NHBC Land Quality Condition 1, which required a remediation report/strategy and verification plan. As a result E&P produced letter referenced CAT/SDP/RAN/44161-005, dated 22 September 2020, a copy of which is enclosed. This confirms that plots 3-4, 6-7, 9-15, 33-42 and 47-49 were located in the area where unsuitable topsoil was identified and these plots would therefore require a 450 mm capping layer with a geotextile marker layer at the base.

Following the issue of this letter, asbestos fragments were encountered in the soil in the vicinity of plots 12 to 15 and as a result, the capping layer thickness was increased to 600 mm, including an anti-dig layer at the base, for these plots. This was agreed with the NHBC and was confirmed in our letter referenced CAT/RAN/44161-008, dated 5 October 2021, a copy of which is enclosed.

We trust the above provides a comprehensible summary of how the remedial measures at the site have evolved over time based on additional intrusive site investigation as well as

following recommendations from the NHBC and after discovery of the presence of asbestos in an isolated area.

Yours sincerely



Ruth Noble

Associate

Enc. Letter ref CAT/RAN/44161-001
 Letter ref CAT/RAN/44161-003
 Letter ref CAT/SDP/RAN/44161-005
 Letter ref CAT/RAN/44161-008

Ms N Waldendorf
Redrow Homes Ltd
Unit 1
Faraday Office Park
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CAT/RAN/44161-001

8 July 2019

Dear Nora,

Angel's and Hyde Nurseries, Barnham – SI Review

Eastwood & Partners have reviewed the following reports prepared for the above site by Geo-Environmental Services Ltd:

- Ground Investigation Report, reference GE10423-GIR-SEP15, dated 10 September 2015; and
- Remediation Method Statement, reference GE15163-RMS-DEC15, dated 10 December 2015.

Site Description

The site covers an area of approximately 3.5 hectares and is located south of Yapton Road (B2233) in Barnham, West Sussex. It comprises a former plant nursery, and at the time of the investigation in June 2015, the site was described as being vacant and overgrown with grass and brambles. A vacant two storey brick building was present in the north east of the site and a number of drainage ditches were present running north/south in the south of the site.

Geology, Hydrogeology & Hydrology

The geology is indicated to be superficial River Terrace Deposits over the London Clay Formation.

The superficial deposits are indicated to comprise a Secondary A Aquifer and the underlying solid geology is classified as Unproductive Strata. The site does not lie within a groundwater Source Protection Zone.

The nearest surface water feature is indicated to be drainage ditches located on site.

Also at: St.Andrew's House, 23 Kingfield Road, Sheffield S11 9AS Tel: 0114 2554554

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Associates: K Edwards MSci, CGeol, FGS A J Kerslake BEng A G Marshall BEng, CEng, MStructE C Hodge EngTech, MICE P A Harrison BEng, CEng, MStructE
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The site is not indicated to be within a flood zone related to rivers or the sea.

History

The earliest maps reviewed indicated the site to be open agricultural land until circa 1938 when the site was divided into four plots of land each containing several small buildings. By 1974 the site is shown to be a nursery containing a number of greenhouses in the east of the site, small buildings in the centre of the site and two residential properties in the north of the site. Small changes were then noted in the layout of the nursery until demolition of the large greenhouses between 2007 and 2012. Many of the smaller structures such as polytunnels etc. were also removed in 2012. The residential properties in the north were then removed between 2015 and 2018.

The surrounding area has been predominantly agricultural, including a number of plant nurseries, and residential. A brickfield was noted around 180 m east of the site on the 1912-1914 map, this was later developed over with residential properties. A disused canal was noted on the 1938-51 map, located around 250 m south of the site.

Gas

One historic landfill site was noted within 250 m of the site, this was the backfilled canal identified on the historical maps. It is located 241 m south of the site and accepted inert waste.

No radon precautions are required.

A backfilled brick field was noted on the historical maps around 180 m east of the site.

Site Works

Geo-Environmental completed the following intrusive investigation works:

- Seven trial pits (TP1 to TP7) to depths of between 2.6 m and 3 m below ground level (bgl);
- Six window sample holes (WS1, WS2 and WS4 to WS7) to depths of 3 m bgl. Three of these (WS1, 4 and 7) were installed with gas and groundwater monitoring wells; and
- Four dynamic probes (DP1, DP2, DP6 and DP7) to depths of 6 m bgl.

Infiltration testing was also completed in two trial pits, TP6 and TP7.

Ground Conditions

Topsoil was encountered at the surface in eight of the thirteen exploratory holes. This was generally described as black or brown sandy silty clay, occasionally with flint gravel, and reached depths of between 0.2 m and 0.5 m bgl.

In the remaining five exploratory holes made ground was identified at the surface. This appeared to comprise topsoil which had become mixed with extraneous material such as brick, concrete, reinforcing bars, glass and nails. It was found to depths of between 0.25 m and 0.95 m bgl.

Underlying the topsoil or made ground, the natural ground was found to comprise cohesive River Terrace Deposits, comprising soft to stiff sandy and/or silty clay with occasional flint gravel. These extended to depths of between 0.85 m and 2 m at which depth granular River Terrace Deposits were encountered. These comprised loose becoming medium dense silty fine to medium sand and were encountered to the base of all of the exploratory holes. The underlying London Clay Formation was not reached in any of the exploratory holes.

Groundwater was encountered in all exploratory holes during the intrusive investigation, at depths between 2 m and 2.95 m bgl. Subsequent groundwater monitoring of the standpipes in WS1, 4 and 7 did not record the presence of any groundwater. It was however, reported that the monitoring visits were undertaken after a prolonged period of dry weather.

Gas Monitoring

Six gas monitoring visits were undertaken on the three installed wells between June and August 2015. The maximum concentrations of methane and carbon dioxide were 0.1% and 4.9% respectively, and the minimum oxygen concentration was 10.5%. The maximum flow rate was 0.1 l/hr. No ground gas precautions were considered necessary.

Geotechnical Testing

Geotechnical testing on samples of the cohesive River Terrace Deposits demonstrated that they are of low to medium volume change potential.

Foundation Recommendations

Due to the presence of soft clay in a number of locations within the cohesive River Terrace Deposits, Geo-Environmental recommended trench-fill foundations within the underlying granular River Terrace Deposits. These were encountered at depths of between 0.85 and 2 m bgl.

The granular River Terrace Deposits are not considered to be shrinkable and were encountered to depths of at least 3 m bgl. Therefore, further deepening due to the presence of trees would not be required.

Groundwater may be encountered in deeper foundations. If this is the case Geo-Environmental recommend that excavations are concreted or blinded as soon as possible after excavation. In addition, foundation trenches should not be left open for prolonged periods and if this is the case the final 500 mm of cover should not be removed until just prior to concreting.

It should be noted however, that the logs describe the granular RTD as unstable, and both trial pits and window sample holes were noted to collapse from the point where the granular RTD were encountered. In addition, we recommend that consideration is given to the potential impact of groundwater. This was recorded as seepages in all of the exploratory holes at depths of between 2 and 2.95 m bgl, however was not recorded during subsequent monitoring visits. This is thought to be the result of a prolonged dry period, and water levels are expected to be higher during wetter times of the year and could prove to be very disruptive to foundation excavations meaning Geo-Environmental's recommendations with regards to groundwater may not be achievable.

Should the top of the granular deposits be present at depths greater than 2.5 m piling may be required.

Geo-Environmental also suggest that location-specific foundations may need to be considered where the existing drainage ditches are to be removed, however no further detail is provided regarding the depth or extent of the drainage ditches or the possible foundation solutions.

Floor Slabs

Geo-Environmental recommend suspended ground floor slabs due to the presence of made ground in excess of 600 mm, and the presence of shrinkable soil.

Infiltration Testing

Infiltration tests were undertaken in TP6 and TP7, however these recorded negligible drops in water level. Traditional chamber soakaways were not therefore considered viable. Alternative SuDS solutions such as permeable paving, in-ground storage, swales and detention basins should be considered.

Roads

Geo-Environmental cite the Transport and Road Research Laboratory Report (LR1132) which estimates an equilibrium suction index of 5% for sandy clays of the River Terrace Deposits. The natural shallow soils are also considered to be frost susceptible. We would give caution to assuming a CBR value as high as 5% at this stage.

CBR tests along the length of proposed roads is recommended prior to construction to obtain accurate CBR values.

Chemical Testing

Geo-Environmental tested a total of twenty samples of shallow soils from across the site at depths of between 0.2 m and 0.5 m bgl. Of these, eight were topsoil, six were made ground and six were natural ground.

Each sample was tested for a suite containing a broad range of contaminants including; metals/metalloids, pH, total organic content, polycyclic aromatic hydrocarbons (PAH), BTEX (benzene, toluene, ethylbenzene & xylene), fractionated petroleum hydrocarbons (TPH CWG) and asbestos. Four samples were also tested for organochlorine pesticides.

Three further samples, collected from hand pits at 0.2 m depth were sent for waste acceptance criteria (WAC) testing.

Chemical Test Results

Of the twenty samples tested only one recorded any elevated levels of contaminants with respect to human health. This was a sample of topsoil from WS6 at 0.2 m which recorded five PAH compounds at concentrations exceeding the assessment criteria for a residential end use with home-grown produce. The elevated compounds are summarised in the table below:

PAH Compound	Recorded Concentration (mg/kg)	Assessment value (mg/kg)
Benzo(a)anthracene	28.3	7.2
Chrysene	27.8	15
Benzo(b)fluoranthene	23.2	2.6
Benzo(a)pyrene	28.3	2.2
Dibenz(ah)anthracene	4.9	0.24

The elevated concentrations were recorded up to 13 times over their respective assessment values. Statistical analysis undertaken by Geo-Environmental has demonstrated that the concentrations of PAHs recorded in this sample represent outliers.

In addition to the above, one sample of made ground recorded a concentration of zinc at levels above the phytotoxic assessment value. A concentration of 406 mg/kg was recorded in WS7 at 0.2 m, compared to the assessment value of 300 mg/kg.

Remedial Measures

Geo-Environmental appear to have mistakenly classed the sample which recorded the elevated concentrations as made ground, however their logs indicate that it is topsoil. They conclude that the made ground, as well as topsoil with inclusions of demolition rubble noted in the centre of the site, is unsuitable to remain in place at the surface in garden areas.

To mitigate the risks from the elevated concentrations of PAHs recorded in the single sample of topsoil, Geo-Environmental recommended that a capping layer is placed in garden and landscaped areas. They note that the existing ground levels are due to be raised by a minimum of 400 mm across the site, thus a cover system will be present in all gardens and landscaped areas.

They state that where elevated levels of contaminants were recorded, and in central areas of the site where physically unsuitable soils are present, the cover system should comprise a minimum thickness of 600 mm. This should comprise 300 mm of verifiably clean topsoil over 300 mm of verifiably clean sub-soil laid over a geotextile membrane.

Where the proposed increase in ground levels in the central area of the site and where the elevated concentrations were recorded, is less than the thickness of the cover system, the underlying unsuitable soils will need to be reduced appropriately to ensure that a minimum of 600 mm of clean soil is in place.

Within their Remediation Method Statement (RMS), Geo-Environmental state that 'Figure 2 shows the proposed gardens and soft landscaping where the unsuitable soils were encountered', however there is no Figure 2 included within the report. E&P have therefore produced a plan based on the information available, a copy is enclosed. Should the plan produced by Geo-Environmental be available, it is recommended that this is consulted.

Within the RMS it is stated that there is an absence of suitable topsoil and subsoil on site, and therefore these will need to be imported. It is considered by E&P that the natural topsoil on site could be considered for re-use, however this material would need to be stripped separately from the unsuitable topsoil/made ground and stockpiled prior to use. Additional sampling and testing of this material may also be required to ensure its suitability. Therefore, it would be the

developer's decision whether or not to undertake the selective soil strip, as the end product would not be guaranteed to be suitable for re-use.

Imported topsoil or subsoil would need to meet physical, chemical and nutritional criteria set out within the RMS in order to be considered suitable for use.

The proposed capping layer would also mitigate against the risk to plant growth from the single elevated concentration of zinc recorded.

Waste Acceptance Criteria Testing

Two samples of made ground and one sample of topsoil were sent for WAC testing. Of the three samples, two (one made ground, one topsoil) were classed as inert and one recorded a total TPH concentration which exceeded the limiting value for classification as inert. This may be due to the organic content of the soil which would not be unusual if it was a topsoil-like material which was tested (no description of the material was provided, so this cannot be confirmed). Should off-site disposal be required, all chemical test results should be forwarded to landfill operators for confirmation of the waste classification.

Risk to Controlled Waters

Although elevated levels of PAHs were recorded in a single sample of topsoil, it was concluded that this was not readily mobile and there is no significant risk to controlled waters.

Conclusion

Geo-Environmental undertook an investigation of the site in 2016. Thirteen exploratory holes, a combination of trial pits and window sampling, were carried out at the 3.5 hectare site. This is considered slightly low for a site of this size, however considering the relative consistency of the ground conditions and the former relatively low risk use of the site, it is not considered unreasonable.

The ground conditions were found to comprise a thin covering of topsoil or made ground over cohesive River Terrace Deposits (RTD) comprising soft to stiff sandy/silty, occasionally gravelly clay. These extended to between 0.85 m and 2 m, where granular RTD were encountered. Strip/trench-fill foundations in the granular RTD were considered appropriate. However, the logs describe the granular RTD as unstable, and both trial pits and window sample holes were noted to collapse from the point where the granular RTD were encountered. In addition, we recommend that consideration is given to the potential impact of groundwater. This was recorded as seepages in all of the exploratory holes at depths of

between 2 and 2.95 m bgl, however was not recorded during subsequent monitoring visits. This is thought to be the result of a prolonged dry period, and water levels are expected to be higher during wetter times of the year.

Chemical testing was undertaken on twenty samples of shallow soils. The test suite and number of samples is considered appropriate for a site of this size and nature. One sample of topsoil recorded elevated levels of a number of PAH compounds. As site levels are to be raised by at least 400 mm a cover system will be incorporated into all plots at the site. Geo-Environmental suggested that this will need to comprise 300 mm of clean and physically suitable topsoil and 300 mm of clean and physically suitable subsoil in areas of existing physically and chemically unsuitable soil. This is currently estimated to cover over 50% of the site, based on the description of soil in the exploratory hole logs, as well as an aerial photograph of the site dated 2015 which shows a large proportion of the surface soil across the site to have been disturbed. Further intrusive investigation and chemical testing may enable both the affected area, and the thickness of the capping layer to be reduced. It may also allow the currently proposed membrane at the base of the capping to be omitted.

It should also be noted that further hotspots of contamination resulting from the former use of the site, for example from any former fuel tanks for heating, cannot be ruled out.

We trust that this meets with your approval, however if you have any comments or queries please do not hesitate to contact us.

Yours sincerely



Catherine Topliss

Enc. Plan showing estimated extent of unsuitable soil

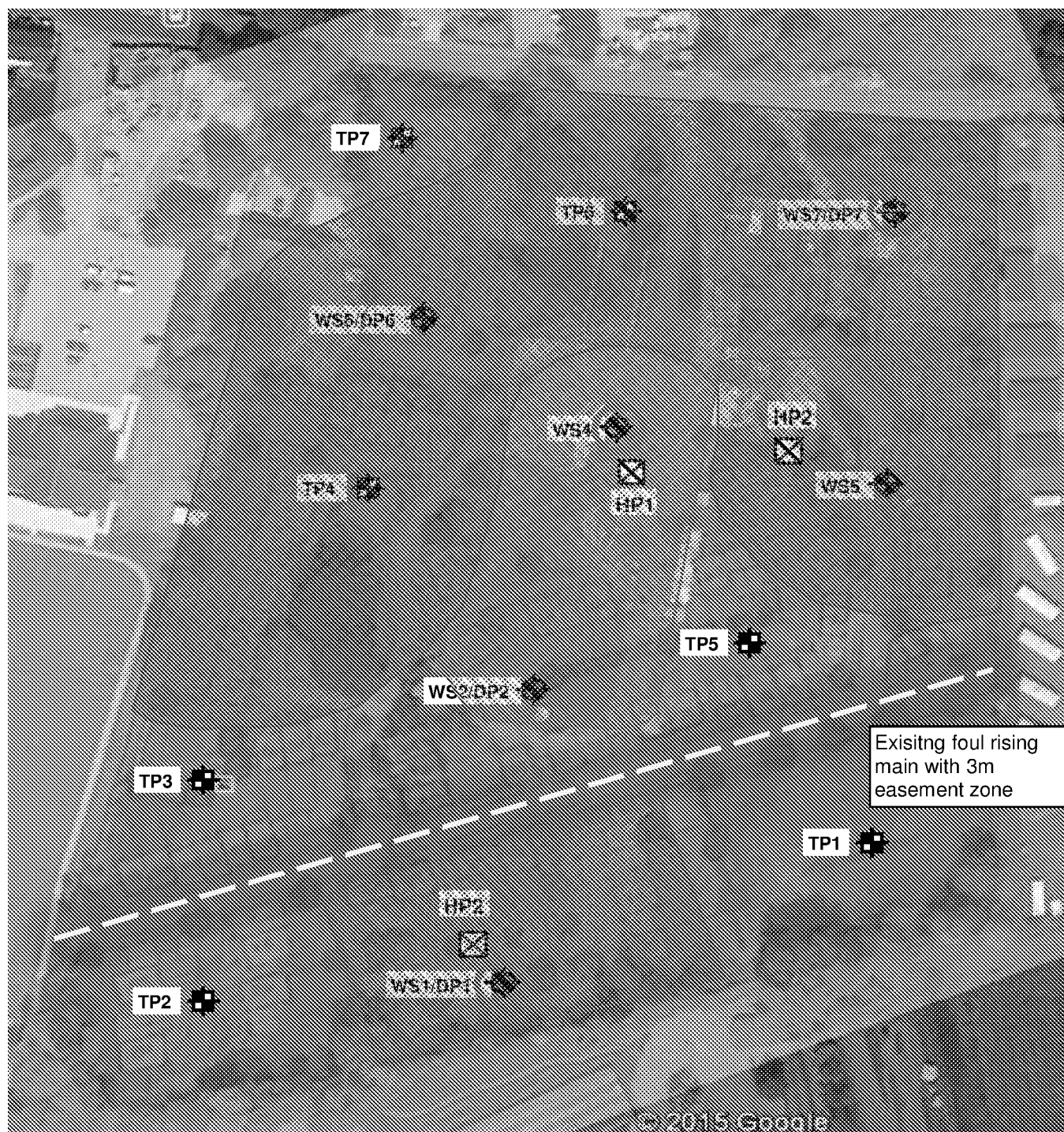
2015 aerial photograph

Eastwood & Partners plan showing estimated extent of soil requiring 600 mm capping in garden and soft landscaped areas

Location of unsuitable soil recorded in exploratory hole log

Approximate extent of area of unsuitable soil based on exploratory hole logs

Approximate extent of re-worked topsoil based on 2015 aerial photograph



Standpipe locations

Project:	Angels Nursery, Barnham			Title:	Site Investigation Plan	
Address:	Yapton Road, Barnham, West Sussex, PO22 0AY			Date:	15/06/2015	Revision: v1
				Drawn:	JO	 Geo-Environmental
Grid Ref:		Scale:	Not to Scale	Ref:	GE10423	
Client:	Lovell Partnerships Ltd			Figure:	2	



2001

Imagery Date: 4/22/2015 50°49'40.94" N 0°38'03.45" W elev

Centaur House, Ancells Business Park, Ancells Road, Fleet, GU51 2UJ

Ms N Waldendorf
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Basingstoke
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RG24 8QQ

CAT/RAN/44161-003

28 February 2020

Dear Nora,

Angel's and Hyde Nurseries, Barnham – Shallow Soil Analysis

At the request of Redrow Homes, Eastwood & Partners undertook a review of available site investigation data. This review noted the following with regards to the recommended remedial measures:

'To mitigate the risks from the elevated concentrations of PAHs recorded in the single sample of topsoil, Geo-Environmental recommended that a capping layer is placed in garden and landscaped areas. They note that the existing ground levels are due to be raised by a minimum of 400 mm across the site, thus a cover system will be present in all gardens and landscaped areas.

They state that where elevated levels of contaminants were recorded, and in central areas of the site where physically unsuitable soils are present, the cover system should comprise a minimum thickness of 600 mm. This should comprise 300 mm of verifiably clean topsoil over 300 mm of verifiably clean sub-soil laid over a geotextile membrane.

Where the proposed increase in ground levels in the central area of the site and where the elevated concentrations were recorded is less than the thickness of the cover system, the underlying unsuitable soils will need to be reduced appropriately to ensure that a minimum of 600 mm of clean soil is in place.'

Eastwood & Partners concluded that further intrusive investigation and chemical testing may enable both the affected area, and the thickness of the capping layer to be reduced. It could also allow the currently proposed membrane at the base of the capping to be omitted. This additional investigation and sampling was subsequently undertaken and is reported on below.

Also at: St. Andrew's House, 23 Kingfield Road, Sheffield S11 9AS Tel: 0114 255 4554

Directors: P Richardson BSc, CEng, MICE, MStructE

S R Ellis BEng, CEng, MStructE, MICE K R Pursall BEng, CEng, MStructE

C A Topliss BSc, CEnv, CSci, CGeol, SiLC, MICE, FGS S J English BEng, CEng, MStructE A R Priest BEng

Technical Director: A G Marshall BEng, CEng, MStructE

Senior Associates: K Newsome BSc, CEng, MICE, MStructE S J Mitchell BSc, MSc, CEng, MEI, MCIBSE, MASHRAE A Allison BEng

M Young MA, CEng, MICE, MStructE C A Wood BSc, CEng, MStructE, MICE

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M P Chappell BEng, IEng, AMStructE, CEng M Dyson BSc, CEng, MStructE A M Cross MEng, CEng, MICE A Lavelle MEng, CEng, MICE

Consultant: S D Preston BEng, CEng, FICE, FStructE

Eastwood & Partners (Consulting Engineers) Limited Registered No 1835021

Site Description

The site covers an area of approximately 3.5 hectares and is located south of Yapton Road (B2233) in Barnham, West Sussex. It comprises a former plant nursery, which has now been demolished and the site remains vacant.

Site Works

We visited the site on 16 December 2019 and excavated twenty-one trial pits, referenced TP101 to TP121, across the site. Each of these pits was terminated upon reaching undisturbed natural ground and reached depths of between 0.3 m and 1.1 m below ground level (bgl). Copies of the trial pit logs are enclosed along with the Exploratory Hole Location Plan, reference 44161/050.

Ground Conditions

Topsoil was encountered in every trial pit, to depths of between 0.1 m and 0.4 m bgl. This was generally found to comprise slightly sandy, slightly gravelly clay with the gravel comprising chalk and flint. Brick fragments were also included in four pits located in the north of the site and other potentially injurious extraneous material, such as glass and iron nails, were encountered in three pits in the east of the site.

Made ground or re-worked ground was encountered underlying the topsoil in seven pits in the northern third of the site to depths of between 0.55 m and 0.9 m. This was generally found to comprise sandy gravelly clay, with the gravel comprising flint and occasional brick, glass, concrete or wood fragments.

Underlying the topsoil or made ground the natural ground was generally found to comprise clay which was often sandy and gravelly, and occasionally silty. The gravel, where present, was flint. In three locations the natural ground was found to be sand which was also clayey and gravelly in two of these locations and silty in the other.

Chemical Testing

Eight samples of made ground and thirteen samples of topsoil we sent for testing following the fieldwork. Each of the samples was analysed for the suite of determinants shown in the table overleaf:

Contaminant Type	Actual Contaminants
Metals/Metalloids	Arsenic, cadmium, chromium (III and VI), lead, mercury, nickel, selenium, copper and zinc
pH	pH
PAHs	Speciated polycyclic aromatic hydrocarbons
Asbestos	Asbestos screen

All testing was undertaken by Chemtest and MCERTs accredited methodologies were used where available.

Chemical Test Results

A copy of the chemical test results (Chemtest report ref 19-42151-2) is enclosed. The results were compared against the assessment criteria relating to a residential end use with home-grown produce. Tables detailing the relevant assessment concentrations used are enclosed.

Topsoil

None of the determinants within the thirteen samples of topsoil tested exceeded the generic assessment concentrations relating to human health. One of the samples however, recorded a marginally elevated concentration of zinc when compared against the phytotoxic assessment concentration. A value of 310 mg/kg was recorded compared to the assessment value of 300 mg/kg. It is considered that this marginal exceedance will not significantly affect plant growth.

The previous testing undertaken as part of a site investigation undertaken by Geo-Environmental included chemical testing of eight samples of topsoil. One of these recorded elevated levels of several PAH compounds which were demonstrated to represent outliers.

Made Ground/Re-worked Ground

Within the eight samples of made ground tested, only one sample recorded any elevated concentrations. The sample from TP106 at 0.4 m recorded elevated concentrations of a number of PAH compounds, as detailed in the table below:

PAH Compound	Recorded Concentration (mg/kg)	Assessment value (mg/kg)
Benzo(a)anthracene	18	7.2
Chrysene	16	15
Benzo(b)fluoranthene	18	2.6
Benzo(a)pyrene	13	2.2
Dibenz(ah)anthracene	1.8	0.24

Statistical analysis indicated that the elevated concentrations are outliers and are therefore representative of a hotspot.

Additional testing of four sub-samples from the original sample pot was then undertaken. Each sub-sample was tested for speciated PAH and the results are summarised in the following table:

PAH Compound	Original result	SS1	SS2	SS3	SS4	Average Conc.	Assessment Value
Benzo(a)anthracene	18	0.22	1.6	4.3	0.76	4.98	7.2
Chrysene	16	0.22	1.5	4.2	0.84	4.55	15
Benzo(b)fluoranthene	18	0.12	2.9	6.8	1.2	5.80	2.6
Benzo(a)pyrene	13	0.21	2.1	4.7	0.72	4.15	2.2
Dibenz(ah)anthracene	1.8	< 0.10	0.32	0.76	< 0.10	0.62	0.24

Values in **bold** exceed the assessment value.

Of the additional testing undertaken across the four sub-samples, only two of the samples recorded any concentrations exceeding the assessment value. Benzo(a)anthracene and Chrysene were not found to be elevated in any of the sub-samples, and where elevated concentrations were recorded, they were found to be significantly lower than the original elevated value.

The average values for the sample from TP106 are still generally outliers. This therefore indicates that a hotspot is present. However, the sub-sampling has demonstrated that the concentrations of PAHs within the sample are highly variable. The initial very high concentrations recorded were queried with the testing laboratory. They reported that the sample contained black carbonaceous fragments and stated that these were most likely the source of the significantly elevated PAH concentrations in the initial testing. They also state that the discrepancy in the range of values recorded is most likely due to the heterogenous nature of the sample.

It is therefore concluded that the significantly elevated concentrations of PAHs are as a result of the presence of carbonaceous flecks within the soil in this location. These flecks make up a very small proportion of the soil in this area and as such the significantly elevated values are considered to be significantly diluted in the material as a whole. Furthermore, the levels in this area are to be raised by between 300 mm and 700 mm, meaning that the soil in question would lie a minimum of 450 mm below finished ground levels. Therefore, no additional remedial measures are considered to be necessary.

Remedial Recommendations - Topsoil

To date, twenty-one samples of topsoil have been tested during both the initial site investigation and the recent round of testing. Of this testing, only one sample of topsoil recorded any elevated concentrations of contaminants, these being a number of PAH compounds. The sample in question was located in an area which was subsequently excavated as part of an archaeological investigation which covered a large area in the north of the site. The soil was stockpiled and, as a result, mixed before being replaced across the area. It is therefore not possible to delineate the elevated concentrations previously recorded. However, due to the low concentrations recorded across all the remaining samples, it is considered that as the soil in the affected area was mixed, the concentrations will have been sufficiently diluted and will not pose a significant risk to human health.

However, the topsoil was noted to contain potentially injurious deleterious material in a number of pits. This was mainly glass fragments presumed to result from the demolition of the former greenhouses, though iron nails were also identified in one location. It is therefore recommended that the topsoil is stripped and screened to remove deleterious inclusions, prior to being re-used in garden areas.

Remedial Recommendations - Made/Reworked Ground

Fourteen samples of made or reworked ground have been tested to date. Only one sample was found to contain any elevated concentrations of contaminants, this being the sample from TP106 at 0.4 m which recorded a number of PAH compounds to be elevated. Additional testing undertaken on this sample, as well as information from the testing laboratory regarding the composition of the sample indicates the elevated concentrations to be a result of carbonaceous flecks which comprise a small proportion of the material. Furthermore, the levels in this area are to be raised by between 300 mm and 700 mm, meaning that the soil in question would lie a minimum of 450 mm below finished ground levels. Therefore, no further remedial measures are proposed.

Testing has demonstrated that the remaining made/reworked ground across the site would be considered chemically suitable to remain in place below the topsoil in garden and landscaped areas. The made ground was however, occasionally noted to contain extraneous material including glass, concrete, brick and wood. As these were not found to be widespread within the material, it is considered that the material would be suitable for re-use, providing any potentially injurious extraneous material (e.g. glass) is removed from the made ground by hand-picking, where it is identified.

Based on the above additional sampling, testing and risk assessment it is considered that no capping layer is required in the garden and landscaped areas of the proposed development providing screening of the topsoil is undertaken.

This document should be submitted to the Local Authority and your warranty provider for their approval prior to being adopted on site.

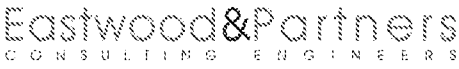
We trust that this meets with your approval, however if you have any comments or queries please do not hesitate to contact us.

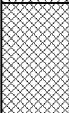
Yours sincerely



Catherine Topliss

Enc. Trial Pit Logs TP101 to TP121
Exploratory Hole Location Plan, drawing ref 44161/050
E&P Chemical Test Results – Chemtest 19-42151-2
GE Chemical Test Results – ELAB 15-02604 & 15-02661 (marked-up)
GE Site Investigation Plan – Reference GE10423, Figure 2
Assessment Values – Residential with home-grown produce

				TrialPit No TP101 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m Depth: £ 		Scale 1:25
Client: Redrow Homes Ltd							Logged RAN

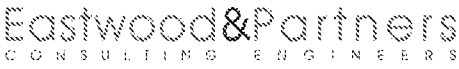
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.15			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk, flint and occasional brick fragments.	
			0.55			RE-WORKED: Brown sandy slightly gravelly CLAY with carbonaceous flecks. Gravel is fine to coarse, rounded to sub-angular of flint with occasional brick fragments.	
			0.80			Firm brown sandy slightly gravelly CLAY. Gravel is fine to coarse, rounded to sub-angular flint.	
						Trialpit Complete at 0.800m	

Remarks:	
Stability:	

Project Name	Project No.	Co-ords: -	Date
Angels & Hyde Nurseries	44161	Level:	16/12/2019
Location: Barnham	Dimensions:		Scale
	Depth: 0.40m	m	1:25
Client: Redrow Homes Ltd			Logged RAN

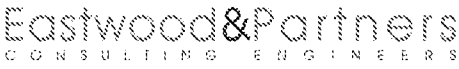
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.15			TOPSOIL: Dark brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium rounded to sub-angular flint.
						Yellow slightly clayey slightly gravelly SAND. Gravel is fine and medium, sub-angular and sub-rounded of flint and sandstone.
			0.40		Trialpit Complete at 0.400m	

Remarks:	
Stability:	

				Trial Pit No TP105 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m Depth: £ 		Scale 1:25
Client: Redrow Homes Ltd							Logged RAN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.15			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk, flint and occasional brick fragments.	1
						RE-WORKED: Brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, rounded to sub-angular flint with occasional brick and glass fragments.	
			0.70			Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, rounded to sub-angular flint.	
			0.90			Trialpit Complete at 0.900m	
							2
							3
							4

Remarks:	
Stability:	

				TrialPit No TP106 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m Depth: £ 		Scale 1:25
Client: Redrow Homes Ltd							Logged RAN

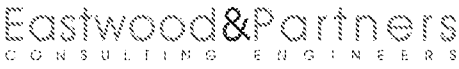
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.15			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk, flint and occasional brick fragments.	
						RE-WORKED: Brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, rounded to sub-angular flint with occasional concrete.	
			0.70			Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, rounded to sub-angular flint.	
			1.00			Trialpit Complete at 1.000m	
							2
							3
							4

Remarks:	
Stability:	

Project Name	Project No.	Co-ords: -	Date
Angels & Hyde Nurseries	44161	Level:	16/12/2019
Location: Barnham	Dimensions:		Scale
	Depth: 0.60m	m	1:25
Client: Redrow Homes Ltd			Logged RAN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.40			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk and flint.
			0.60			Firm brown/orange slightly sandy CLAY.
						Trialpit Complete at 0.600m

Remarks:	
Stability:	

				TrialPit No TP108 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m Depth: £ 0.60m		Scale 1:25
Client: Redrow Homes Ltd							Logged RAN

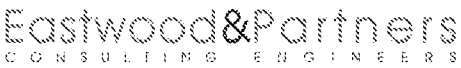
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.30			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk and flint.
			0.60			Firm brown/orange slightly sandy CLAY.
						Trialpit Complete at 0.600m
						1
						2
						3
						4

Remarks:	
Stability:	

Project Name	Project No.	Co-ords: -	Date
Angels & Hyde Nurseries	44161	Level:	16/12/2019
Location: Barnham	Dimensions:		Scale
	Depth: m 0.50m		1:25
Client: Redrow Homes Ltd			Logged RAN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.15			TOPSOIL: Brown slightly sandy CLAY.	-
						Firm brown sandy SILT/silty SAND.	
			0.50			Trialpit Complete at 0.500m	

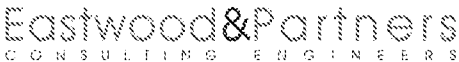
Remarks:	
Stability:	

				TrialPit No TP110 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m Depth: £ 		Scale 1:25
Client: Redrow Homes Ltd							Logged RAN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.30			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk and flint.
			0.40			Yellow/orange slightly gravelly clayey SAND. Gravel is fine and medium, angular and sub-angular flint.
Trialpit Complete at 0.400m						

Remarks:

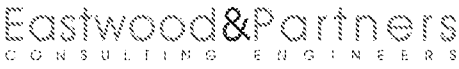
Stability:

				TrialPit No TP111 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m		Scale 1:25
Client: Redrow Homes Ltd					Depth: 0.50m E		Logged RAN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description																																																								
Depth (m)	Type	Results																																																												
			0.20			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk and flint.																																																								
			0.50			Firm red/orange slightly sandy slightly gravelly CLAY. Gravel is fine and medium, sub-angular and sub-rounded flint.																																																								
						Trialpit Complete at 0.500m																																																								

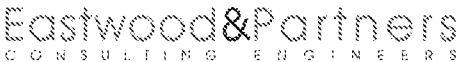
Remarks:

Stability:

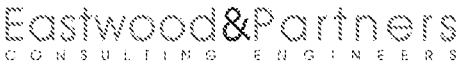
				TrialPit No TP112 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m Depth: £ 		Scale 1:25
Client: Redrow Homes Ltd							Logged RAN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk and flint.	
			0.70			POSSIBLY RE-WORKED: Pale brown slightly sandy slightly gravelly SILT. Gravel is fine and medium, rounded to sub-angular flint.	
			1.10			Firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, rounded to sub-angular flint.	-1
						Trialpit Complete at 1.100m	-2
							-3
							-4

Remarks:	
Stability:	

				TrialPit No TP113 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m Depth: £ 		Scale 1:25
Client: Redrow Homes Ltd					0.40m		Logged RAN
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.20			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk and flint.	
			0.40			Firm orange/brown sandy CLAY.	
Trialpit Complete at 0.400m							
Remarks:							
Stability:							

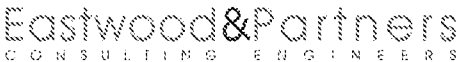
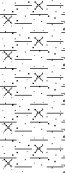
Eastwood&Partners CONSULTING ENGINEERS							TrialPit No TP114 Sheet 1 of 1	
Project Name Angels & Hyde Nurseries				Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham						Dimensions: m		Scale 1:25
Client: Redrow Homes Ltd						Depth: 0.30m		Logged RAN
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description		
Depth (m)	Type	Results						
			0.10			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk and flint. Firm brown silty CLAY.		
			0.30					
						Trialpit Complete at 0.300m		
1 2 3 4								
Remarks:								
Stability:								

				TrialPit No TP117 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m Depth: £ 		Scale 1:25
Client: Redrow Homes Ltd							Logged RAN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.15			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk and flint.
						Pale brown slightly sandy CLAY/SILT.
			0.50			Firm orange/brown CLAY.
			0.70			Trialpit Complete at 0.700m

Remarks:

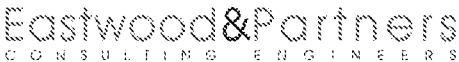
 Stability:

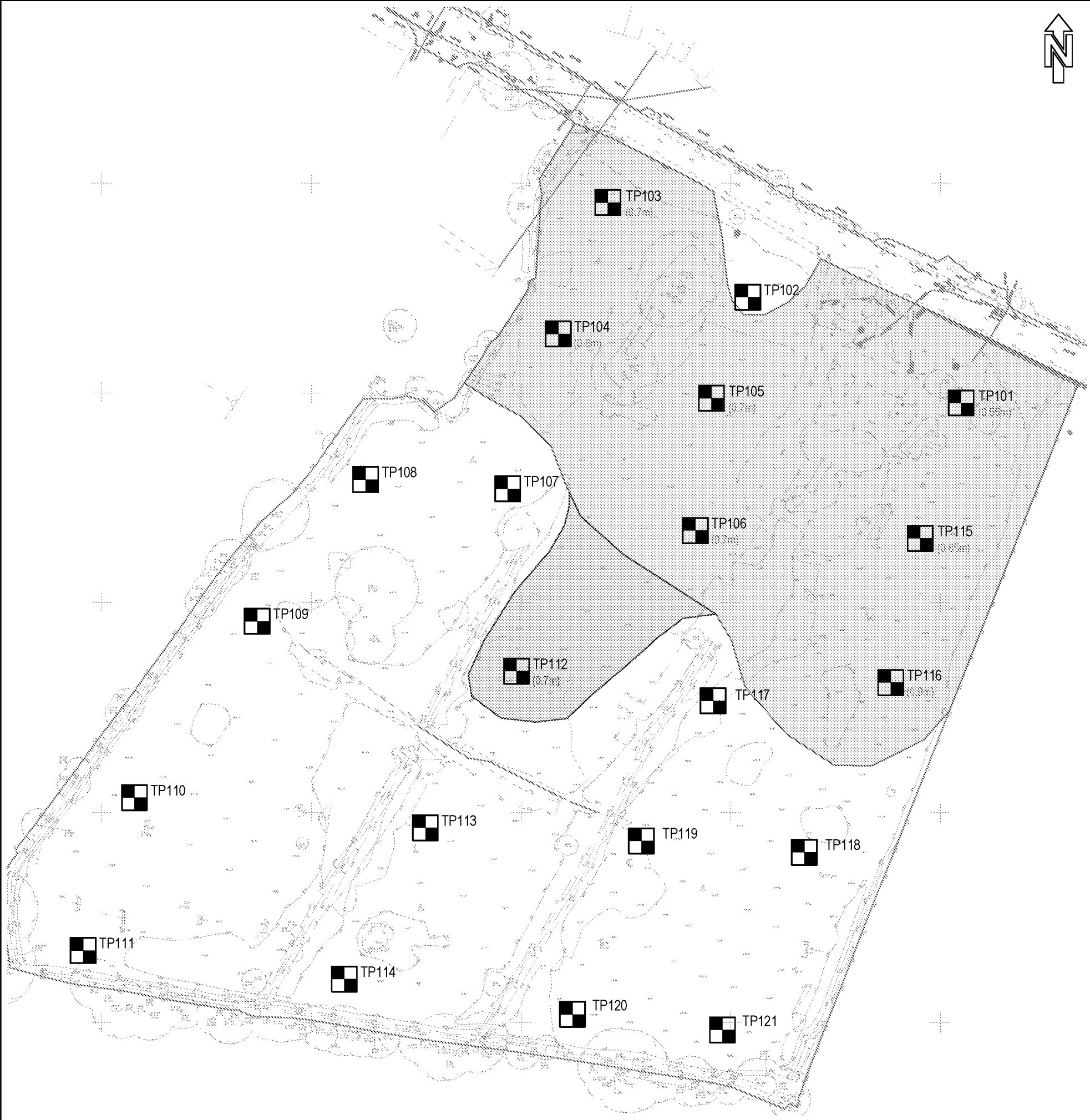
				TrialPit No TP118 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m		Scale 1:25
Client: Redrow Homes Ltd					Depth: 0.80m		Logged RAN
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.20			TOPSOIL: Brown slightly sandy slightly gravelly CLAY. Gravel is fine and medium, rounded to sub-angular of chalk and flint.	
			0.80			Pale brown slightly sandy CLAY/SILT.	
Trialpit Complete at 0.800m							
Remarks:							
Stability:							

Project Name Angels & Hyde Nurseries		Project No. 44161	Co-ords: - Level:	Date 16/12/2019
Location: Barnham			Dimensions: m	Scale 1:25
Client: Redrow Homes Ltd			Depth: 0.60m	Logged RAN

Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.30			TOPSOIL: Brown silty slightly gravelly CLAY. Gravel is fine and medium, sub-rounded to sub-angular flint.	
			0.60			Firm brown/orange silty CLAY.	
						Trialpit Complete at 0.600m	

Remarks:	
Stability:	

				TrialPit No TP121 Sheet 1 of 1			
Project Name Angels & Hyde Nurseries			Project No. 44161		Co-ords: - Level:		Date 16/12/2019
Location: Barnham					Dimensions: m		Scale 1:25
Client: Redrow Homes Ltd					Depth: 0.40m		Logged RAN
Samples & In Situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description	
Depth (m)	Type	Results					
			0.20			TOPSOIL: Brown silty slightly gravelly CLAY. Gravel is fine and medium, sub-rounded to sub-angular flint.	
			0.40			Firm brown/orange silty CLAY.	
Trialpit Complete at 0.400m							
							1 2 3 4
Remarks:							
Stability:							



INFORMATION WITHIN THIS DRAWING IS NOT NECESSARILY PRODUCED TO SCALE.
ALWAYS USE FIGURED DIMENSIONS AND CO-ORDINATES - IF IN DOUBT, ASK.

KEY:	
	Approximate location of topsoil / made ground sampling location carried out by Eastwood & Partners on 16.12.19.
(0.7m)	Approximate depth of made / re-worked ground.
(0.7m)	Approximate depth of possible made / re-worked ground.
	Approximate expected extent of made / re-worked ground.
	Approximate possible further extent of made / re-worked ground.

A	First Issue.			
REV	DESCRIPTION	SIG	CHK	DATE

REDROW HOMES LTD

ANGEL'S & HYDE NURSERIES,
YAPTON ROAD, BARNHAM

EXPLORATORY HOLE LOCATION PLAN

Eastwood & Partners
CONSULTING ENGINEERS

St. Andrew's House
23 Kingfield Road
Sheffield
S11 9AS

Tel 0114 255 4554
Fax 0114 255 4330

mail@eastwoodandpartners.com
www.eastwoodandpartners.com

SCALE WHEN PLOTTED AT A3 1:1000			DRAWING STATUS INFORMATION	
DRAWN RH	CHECKED RAN	DATE 21.01.20	DRAWING NUMBER 44161 / 050	REV A



Amended Report

Report No.: 19-42151-2

Initial Date of Issue: 02-Jan-2020 **Date of Re-Issue:** 04-Feb-2020

Client Eastwood & Partners

Client Address: St. Andrews House
23 Kingfield Road
Sheffield
South Yorkshire
S11 9AS

Contact(s): Geo
Ruth Noble

Project 44161 Angel & Hyde Nurseries,
Barnham

Quotation No.: **Date Received:** 18-Dec-2019

Order No.: 44161-02 **Date Instructed:** 18-Dec-2019

No. of Samples: 25

Turnaround (Wkdays): 29 **Results Due:** 04-Feb-2020

Date Approved: 04-Feb-2020

Approved By:



Details: Glynn Harvey, Laboratory Manager

Results - Soil

Client: Eastwood & Partners	Chemtest Job No.:		19-42151	19-42151	19-42151	19-42151	19-42151	19-42151	19-42151	19-42151	19-42151	19-42151	19-42151
Quotation No.:	Chemtest Sample ID.:		945057	945058	945059	945060	945061	945062	945063	945064	945065		
Order No.: 44161-02	Client Sample Ref.:												
	Sample Location:		TP101	TP101	TP103	TP103	TP104	TP104	TP105	TP105	TP106		
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL		
	Top Depth (m):		0.10	0.40	0.10	0.40	0.10	0.40	0.10	0.40	0.10		
	Date Sampled:		16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019		
	Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY		
Determinand	Accred.	SOP	Units	LOD									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	-	-	-
Moisture	N	2030	%	0.020	22	14	18	16	18	17	17	14	13
Soil Colour	N	2040		N/A	Brown,	Brown,	Brown,	Brown,	Brown,	Brown,	Brown,	Brown,	Brown,
Other Material	N	2040		N/A	Roots,	Roots,	Roots,	Roots,	Roots,	Stones,	Stones,	NONE,	Roots,
Soil Texture	N	2040		N/A	Clay,	Clay,	Clay,	Clay,	Clay,	Clay,	Clay,	Clay,	Clay,
pH	M	2010		4.0	7.8	8.2	7.8	8.1	7.8	8.1	8.2	8.2	7.9
Arsenic	M	2450	mg/kg	1.0	17	17	9.2	15	8.6	9.2	12	11	13
Cadmium	M	2450	mg/kg	0.10	0.37	0.42	0.35	0.21	0.29	0.27	0.41	0.30	0.36
Chromium	M	2450	mg/kg	1.0	22	24	20	26	27	26	24	25	21
Copper	U	2450	mg/kg	0.50	23	16	24	20	22	21	30	20	25
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10	0.13	< 0.10	< 0.10	< 0.10	0.10	< 0.10	< 0.10
Nickel	M	2450	mg/kg	0.50	19	22	16	22	20	19	20	19	17
Lead	M	2450	mg/kg	0.50	42	31	39	20	42	110	64	27	52
Selenium	M	2450	mg/kg	0.20	0.27	0.24	0.30	0.25	0.32	0.24	0.28	0.24	0.23
Zinc	U	2450	mg/kg	0.50	110	82	110	63	110	110	170	170	160
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	0.14	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	0.47	0.38	< 0.10	0.20	< 0.10	0.45	0.93	< 0.10	0.11
Anthracene	M	2800	mg/kg	0.10	0.13	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.17	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	1.9	1.7	0.45	0.35	0.28	1.1	2.6	0.33	0.49
Pyrene	M	2800	mg/kg	0.10	2.1	1.8	0.50	0.29	0.28	1.1	2.7	0.36	0.47
Benzo[a]anthracene	M	2800	mg/kg	0.10	0.94	0.79	0.13	< 0.10	< 0.10	0.28	1.0	< 0.10	0.12
Chrysene	M	2800	mg/kg	0.10	0.93	0.75	0.12	< 0.10	< 0.10	0.33	1.2	< 0.10	0.17
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	1.6	1.4	0.24	< 0.10	< 0.10	0.62	1.8	< 0.10	0.30
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	0.40	0.36	< 0.10	< 0.10	< 0.10	0.13	0.47	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	1.0	0.99	0.14	< 0.10	< 0.10	0.34	1.2	< 0.10	0.18
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	0.86	0.82	0.13	< 0.10	< 0.10	0.35	0.93	< 0.10	0.22
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	0.94	0.77	0.15	< 0.10	< 0.10	0.55	0.91	< 0.10	0.28
Total Of 16 PAH's	N	2800	mg/kg	2.0	11	9.8	< 2.0	< 2.0	< 2.0	5.3	14	< 2.0	2.3

Results - Soil

Client: Eastwood & Partners	Chemtest Job No.:				19-42151	19-42151	19-42151	19-42151	19-42151	19-42151	19-42151	19-42151	19-42151
Quotation No.:	Chemtest Sample ID.:				945066	945067	945068	945069	945070	945071	945072	945073	945074
Order No.: 44161-02	Client Sample Ref.:												
	Sample Location:				TP106	TP108	TP110	TP112	TP112	TP114	TP115	TP115	TP116
	Sample Type:				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):				0.40	0.10	0.10	0.10	0.40	0.10	0.10	0.40	0.10
	Date Sampled:				16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019
	Asbestos Lab:				COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY	COVENTRY
Determinand	Accred.	SOP	Units	LOD									
ACM Type	U	2192		N/A	-	-	-	-	-	-	-	-	-
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected
ACM Detection Stage	U	2192		N/A	-	-	-	-	-	-	-	-	-
Moisture	N	2030	%	0.020	13	17	16	17	12	18	14	14	20
Soil Colour	N	2040		N/A	Brown,	Brown,	Brown,	Brown,	Brown,	Brown,	Brown,	Brown,	Brown,
Other Material	N	2040		N/A	NONE,	Roots,	Roots,	Roots,	Stones,	Roots,	Roots,	NONE,	NONE,
Soil Texture	N	2040		N/A	Clay,	Clay,	Clay,	Clay,	Clay,	Clay,	Clay,	Clay,	Clay,
pH	M	2010		4.0	8.3	7.4	7.3	7.8	8.0	6.9	7.6	7.8	7.7
Arsenic	M	2450	mg/kg	1.0	8.8	7.1	7.7	12	6.2	9.1	7.4	8.3	11
Cadmium	M	2450	mg/kg	0.10	0.29	0.47	0.31	0.53	0.16	0.25	0.28	0.16	0.63
Chromium	M	2450	mg/kg	1.0	21	16	17	26	18	22	16	23	24
Copper	U	2450	mg/kg	0.50	19	29	35	28	11	16	18	13	29
Mercury	M	2450	mg/kg	0.10	< 0.10	0.12	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.12
Nickel	M	2450	mg/kg	0.50	18	13	12	19	11	18	12	15	16
Lead	M	2450	mg/kg	0.50	77	40	21	49	14	17	32	15	43
Selenium	M	2450	mg/kg	0.20	0.21	0.30	0.29	0.43	0.26	0.24	0.22	0.22	0.29
Zinc	U	2450	mg/kg	0.50	110	120	75	180	42	65	90	48	190
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50
Naphthalene	M	2800	mg/kg	0.10	0.72	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthylene	N	2800	mg/kg	0.10	0.72	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Acenaphthene	M	2800	mg/kg	0.10	8.2	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluorene	M	2800	mg/kg	0.10	5.9	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Phenanthrene	M	2800	mg/kg	0.10	50	0.56	< 0.10	0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Anthracene	M	2800	mg/kg	0.10	13	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Fluoranthene	M	2800	mg/kg	0.10	49	1.1	< 0.10	0.29	< 0.10	< 0.10	0.21	< 0.10	< 0.10
Pyrene	M	2800	mg/kg	0.10	37	1.2	< 0.10	0.31	< 0.10	< 0.10	0.23	< 0.10	< 0.10
Benzo[a]anthracene	M	2800	mg/kg	0.10	18	0.27	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Chrysene	M	2800	mg/kg	0.10	16	0.35	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	18	0.53	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	7.2	0.11	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[a]pyrene	M	2800	mg/kg	0.10	13	0.32	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	9.5	0.28	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	1.8	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	8.4	0.29	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
Total Of 16 PAH's	N	2800	mg/kg	2.0	260	5.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0

Results - Soil

Client: Eastwood & Partners	Chemtest Job No.:		19-42151	19-42151	19-42151	19-42151	19-42151	19-42151	19-42151
Quotation No.:	Chemtest Sample ID.:		945075	945076	945077	960321	960322	960323	960324
Order No.: 44161-02	Client Sample Ref.:					sub-sample 1	sub-sample 2	sub-sample 3	sub-sample 4
	Sample Location:		TP116	TP118	TP118	TP106	TP106	TP106	TP106
	Sample Type:		SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Top Depth (m):		0.40	0.10	0.10	0.40	0.40	0.40	0.40
	Date Sampled:		16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019	16-Dec-2019
	Asbestos Lab:		COVENTRY	COVENTRY	COVENTRY				
Determinand	Accred.	SOP	Units	LOD					
ACM Type	U	2192		N/A	-	-	-		
Asbestos Identification	U	2192	%	0.001	No Asbestos Detected	No Asbestos Detected	No Asbestos Detected		
ACM Detection Stage	U	2192		N/A	-	-	-		
Moisture	N	2030	%	0.020	15	18	14	11	18
Soil Colour	N	2040		N/A	Brown,	Brown,	Brown,		
Other Material	N	2040		N/A	NONE,	NONE,	Roots,		
Soil Texture	N	2040		N/A	Clay,	Clay,	Clay,		
pH	M	2010		4.0	7.9	7.8	8.1		
Arsenic	M	2450	mg/kg	1.0	5.6	7.4	30		
Cadmium	M	2450	mg/kg	0.10	0.25	0.31	0.35		
Chromium	M	2450	mg/kg	1.0	20	17	42		
Copper	U	2450	mg/kg	0.50	9.6	13	40		
Mercury	M	2450	mg/kg	0.10	< 0.10	< 0.10	< 0.10		
Nickel	M	2450	mg/kg	0.50	14	12	14		
Lead	M	2450	mg/kg	0.50	12	21	86		
Selenium	M	2450	mg/kg	0.20	< 0.20	0.28	0.27		
Zinc	U	2450	mg/kg	0.50	45	54	310		
Chromium (Hexavalent)	N	2490	mg/kg	0.50	< 0.50	< 0.50	< 0.50		
Naphthalene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.20
Acenaphthylene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.14
Acenaphthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.41
Fluorene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.34
Phenanthrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.22	1.2
Anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.40
Fluoranthene	M	2800	mg/kg	0.10	< 0.10	0.14	< 0.10	0.43	3.0
Pyrene	M	2800	mg/kg	0.10	< 0.10	0.13	< 0.10	0.42	2.8
Benzo[a]anthracene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.22	1.6
Chrysene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.22	1.5
Benzo[b]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.12	2.9
Benzo[k]fluoranthene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.11	0.89
Benzo[a]pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.21	2.1
Indeno(1,2,3-c,d)Pyrene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.15	2.1
Dibenz(a,h)Anthracene	N	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	< 0.10	0.32
Benzo[g,h,i]perylene	M	2800	mg/kg	0.10	< 0.10	< 0.10	< 0.10	0.22	1.9
Total Of 16 PAH's	N	2800	mg/kg	2.0	< 2.0	< 2.0	< 2.0	2.3	21

SOP	Title	Parameters included	Method summary
2010	pH Value of Soils	pH	pH Meter
2030	Moisture and Stone Content of Soils(Requirement of MCERTS)	Moisture content	Determination of moisture content of soil as a percentage of its as received mass obtained at <37°C.
2040	Soil Description(Requirement of MCERTS)	Soil description	As received soil is described based upon BS5930
2120	Water Soluble Boron, Sulphate, Magnesium & Chromium	Boron; Sulphate; Magnesium; Chromium	Aqueous extraction / ICP-OES
2192	Asbestos	Asbestos	Polarised light microscopy / Gravimetry
2450	Acid Soluble Metals in Soils	Metals, including: Arsenic; Barium; Beryllium; Cadmium; Chromium; Cobalt; Copper; Lead; Manganese; Mercury; Molybdenum; Nickel; Selenium; Vanadium; Zinc	Acid digestion followed by determination of metals in extract by ICP-MS.
2490	Hexavalent Chromium in Soils	Chromium [VI]	Soil extracts are prepared by extracting dried and ground soil samples into boiling water. Chromium [VI] is determined by 'Aquakem 600' Discrete Analyser using 1,5-diphenylcarbazide.
2800	Speciated Polynuclear Aromatic Hydrocarbons (PAH) in Soil by GC-MS	Acenaphthene*; Acenaphthylene; Anthracene*; Benzo[a]Anthracene*; Benzo[a]Pyrene*; Benzo[b]Fluoranthene*; Benzo[ghi]Perylene*; Benzo[k]Fluoranthene; Chrysene*; Dibenzo[ah]Anthracene; Fluoranthene*; Fluorene*; Indeno[123cd]Pyrene*; Naphthalene*; Phenanthrene*; Pyrene*	Dichloromethane extraction / GC-MS

Report Information

Key

- U UKAS accredited
- M MCERTS and UKAS accredited
- N Unaccredited
- S This analysis has been subcontracted to a UKAS accredited laboratory that is accredited for this analysis
- SN This analysis has been subcontracted to a UKAS accredited laboratory that is not accredited for this analysis
- T This analysis has been subcontracted to an unaccredited laboratory
- I/S Insufficient Sample
- U/S Unsuitable Sample
- N/E not evaluated
- < "less than"
- > "greater than"

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

Uncertainty of measurement for the determinands tested are available upon request

None of the results in this report have been recovery corrected

All results are expressed on a dry weight basis

The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, Phenols

For all other tests the samples were dried at < 37°C prior to analysis

All Asbestos testing is performed at the indicated laboratory

Issue numbers are sequential starting with 1 all subsequent reports are incremented by 1

Sample Deviation Codes

- A - Date of sampling not supplied
- B - Sample age exceeds stability time (sampling to extraction)
- C - Sample not received in appropriate containers
- D - Broken Container
- E - Insufficient Sample (Applies to LOI in Trommel Fines Only)

Sample Retention and Disposal

All soil samples will be retained for a period of 45 days from the date of receipt

All water samples will be retained for 14 days from the date of receipt

Charges may apply to extended sample storage

If you require extended retention of samples, please email your requirements to:

customerservices@chemtest.com



2683



Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY



THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 15-02604

Issue: 1

Date of Issue: 01/07/2015

Contact: Justyna Oak

Customer Details: GESL ☐
Unit 7 ☐
Danworth Farm ☐
Hurstpierpoint ☐
West Sussex

Quotation No: Q14-00021

Order No: 3625

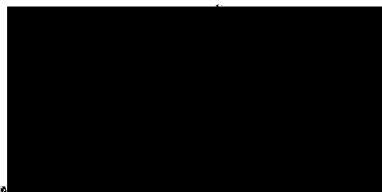
Customer Reference: GE10423

Date Received: 23/06/2015

Date Approved: 01/07/2015

Details: Angels Nursery, Barnham

Approved by:



John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)



Sample Summary

Report No.: 15-02604

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
31721	TP1 0.20	22/06/2015	25/06/2015	Silty loam	
31722	TP1 0.50	22/06/2015	25/06/2015	Silty loam	
31723	TP2 0.20	22/06/2015	25/06/2015	Silty loam	
31724	TP3 0.20	22/06/2015	25/06/2015	Silty loam	
31725	TP4 0.20	22/06/2015	25/06/2015	Silty loam	
31726	TP4 0.50	22/06/2015	25/06/2015	Silty loam	
31727	TP5 0.20	22/06/2015	25/06/2015	Silty loam	
31728	TP5 0.50	22/06/2015	25/06/2015		
31729	TP6 0.20	22/06/2015	25/06/2015	Silty loam	
31730	TP6 0.50	22/06/2015	25/06/2015	Silty loam	
31731	TP7 0.20	22/06/2015	25/06/2015	Silty loam	
31732	TP7 0.50	22/06/2015	25/06/2015	Silty loam	
31733	WS1 0.20	22/06/2015	25/06/2015	Silty loam	
31734	WS1 0.50	22/06/2015	25/06/2015		
31735	WS2 0.20	22/06/2015	25/06/2015	Silty loam	
31736	WS2 0.50	22/06/2015	25/06/2015	Silty loam	
31737	WS6 0.20	22/06/2015	25/06/2015	Silty loam	
31738	WS6 0.50	22/06/2015	25/06/2015	Silty loam	
31739	WS7 0.20	22/06/2015	25/06/2015	Silty loam	
31740	WS7 0.50	22/06/2015	25/06/2015	Silty loam	



Results Summary

Report No.: 15-02604

2683

ELAB Reference				31721	31722	31723	31724	31725	31726
Customer Reference									
Sample ID									
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP1	TP1	TP2	TP3	TP4	TP4
Sample Depth (m)				0.20	0.50	0.20	0.20	0.20	0.50
Sampling Date				22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015
Determinand	Codes	Units	LOD	TS	NAT	TS	TS	MG	NAT
Metals									
Arsenic	M	mg/kg	1	10.9	8.4	9.4	10.8	12.2	9.3
Barium	M	mg/kg	10	65.7	51.9	49.3	52.5	80.2	65.5
Beryllium	U	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	21.1	20.4	19.7	18.6	25.7	23.8
Copper	M	mg/kg	5	21.2	17.4	33.7	18.8	27.3	20.6
Lead	M	mg/kg	5	34.2	15.9	19.2	30.6	48.8	29.6
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	12.9	12.3	13.5	11.6	18.0	17.5
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium	M	mg/kg	5	26.0	27.1	26.8	25.9	30.9	30.9
Zinc	M	mg/kg	45	91.6	48.8	73.2	62.1	167	108
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	0.02	< 0.02	< 0.02	< 0.02	0.02	0.04
Inorganics									
Elemental Sulphur	N	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	1.1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%SO4	0.02	0.04	0.03	0.04	0.05	0.05	0.04
Water Soluble Boron	N	mg/kg	0.5	2.5	1.3	0.8	0.6	1.0	0.7
Miscellaneous									
pH	M	units	0.1	7.7	8.0	5.8	5.9	7.1	7.6
Total Organic Carbon	N	%	0.01	1.2	0.32	0.63	1.2	1.2	0.52
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH(16)	M	mg/kg	2	< 2	< 2	< 2	< 2	< 2	3
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

Report No.: 15-02604

2683

ELAB Reference				31721	31722	31723	31724	31725	31726
Customer Reference									
Sample ID									
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP1	TP1	TP2	TP3	TP4	TP4
Sample Depth (m)				0.20	0.50	0.20	0.20	0.20	0.50
Sampling Date				22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015
Determinand	Codes	Units	LOD	TS	NAT	TS	TS	MG	NAT
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	1.5	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	< 1.0	< 1.0	1.5	< 1.0	< 1.0
OrganoChlorine Pesticides									
alpha-HCH	M	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
beta_HCH	M	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
gamma-HCH	M	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
delta-HCH	N	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
Heptachlor	N	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
Aldrin	M	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
Heptachlor expoxide	N	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
trans-Chlordane	N	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
alpha cis-Chlordane	N	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
p,p-DDE	M	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
Dieldrin	M	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
Endrin	N	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
p,p-DDD	M	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
Endosulfan II	N	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
Endrin aldehyde	N	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
p,p-DDT	M	ug/kg	10	< 10	n/t	n/t	< 10	14	n/t
Endosulphan sulphate	M	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
Methoxychlor	N	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t
Endrin ketone	N	ug/kg	10	< 10	n/t	n/t	< 10	< 10	n/t

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Results Summary

Report No.: 15-02604

2683

ELAB Reference				31727	31729	31730	31731	31732	31733
Customer Reference									
Sample ID									
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP5	TP6	TP6	TP7	TP7	WS1
Sample Depth (m)				0.20	0.20	0.50	0.20	0.50	0.20
Sampling Date				22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015
Determinand	Codes	Units	LOD	TS	MG	MG	TS	NAT	MG
Metals									
Arsenic	M	mg/kg	1	10.8	9.0	10.2	11.1	15.0	11.0
Barium	M	mg/kg	10	57.6	63.8	80.1	75.7	81.3	56.3
Beryllium	U	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	1.0	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	22.2	23.3	27.0	26.7	28.3	20.0
Copper	M	mg/kg	5	20.6	16.5	28.9	20.9	18.5	19.0
Lead	M	mg/kg	5	32.6	18.3	35.3	23.1	13.3	21.2
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	12.8	14.5	18.5	20.0	27.3	14.7
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.0
Vanadium	M	mg/kg	5	25.8	29.6	35.2	35.3	40.0	28.1
Zinc	M	mg/kg	45	107	85.7	115	76.6	55.5	63.4
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	< 0.02	0.02	0.02	< 0.02	< 0.02
Inorganics									
Elemental Sulphur	N	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO4)	U	%SO4	0.02	0.06	0.05	0.02	0.03	0.02	0.04
Water Soluble Boron	N	mg/kg	0.5	0.9	< 0.5	0.5	0.5	< 0.5	0.9
Miscellaneous									
pH	M	units	0.1	7.3	7.3	7.5	7.3	7.1	6.5
Total Organic Carbon	N	%	0.01	1.4	0.39	0.62	0.46	0.15	0.53
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	< 0.5	0.8	0.5	< 0.5	< 0.5	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Total PAH(16)	M	mg/kg	2	< 2	5	3	< 2	< 2	< 2
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

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Report No.: 15-02604

ELAB Reference				31727	31729	31730	31731	31732	31733
Customer Reference									
Sample ID									
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				TP5	TP6	TP6	TP7	TP7	WS1
Sample Depth (m)				0.20	0.20	0.50	0.20	0.50	0.20
Sampling Date				22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015
Determinand	Codes	Units	LOD	TS	MG	MG	TS	NAT	MG
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	3.5	< 1.0	1.8	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	4.3	< 1.0	4.7	< 1.0	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	7.7	< 1.0	6.5	< 1.0	< 1.0
OrganoChlorine Pesticides									
alpha-HCH	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
Aldrin	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
Endrin	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	< 10	n/t	n/t	n/t

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Results Summary

Report No.: 15-02604

2683

ELAB Reference				31735	31736	31737	31738	31739	31740
Customer Reference									
Sample ID									
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				WS2	WS2	WS6	WS6	WS7	WS7
Sample Depth (m)				0.20	0.50	0.20	0.50	0.20	0.50
Sampling Date				22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015
Determinand	Codes	Units	LOD	TS	NAT	TS	NAT	MG	NAT
Metals									
Arsenic	M	mg/kg	1	10.5	9.8	9.2	10.9	14.3	13.2
Barium	M	mg/kg	10	68.5	53.4	66.8	67.1	209	82.5
Beryllium	U	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	1.2	< 1.0
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	0.8	< 0.5
Chromium	M	mg/kg	5	20.2	19.6	21.7	22.3	25.0	25.8
Copper	M	mg/kg	5	26.6	17.5	19.8	19.9	44.7	21.4
Lead	M	mg/kg	5	35.5	17.9	28.7	38.4	114	23.8
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	15.8	13.5	15.8	19.1	21.9	21.7
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	1.4	< 1.0
Vanadium	M	mg/kg	5	27.4	27.4	29.2	31.3	37.0	35.7
Zinc	M	mg/kg	45	98.4	65.6	86.9	62.4	406	71.2
Anions									
Water Soluble Chloride	M	mg/kg	40	< 40	< 40	< 40	< 40	< 40	< 40
Water Soluble Sulphate	M	g/l	0.02	< 0.02	0.03	< 0.02	< 0.02	< 0.02	< 0.02
Inorganics									
Elemental Sulphur	N	mg/kg	20	< 20	< 20	< 20	< 20	< 20	< 20
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8	< 0.8
Total Sulphide	N	mg/kg	2	< 2	< 2	< 2	< 2	< 2	< 2
Total Cyanide	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Acid Soluble Sulphate (SO ₄)	U	%SO ₄	0.02	0.03	0.05	0.04	0.02	0.07	0.04
Water Soluble Boron	N	mg/kg	0.5	0.8	0.8	0.5	< 0.5	1.0	0.7
Miscellaneous									
pH	M	units	0.1	6.8	7.3	7.4	7.1	6.7	7.4
Total Organic Carbon	N	%	0.01	0.77	0.42	0.54	0.33	4.6	0.54
Phenols									
Total Phenols	N	mg/kg	6	< 6	< 6	< 6	< 6	< 6	< 6
Polyaromatic hydrocarbons									
Naphthalene	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Acenaphthylene	M	mg/kg	0.5	< 0.5	< 0.5	1.5	< 0.5	< 0.5	< 0.5
Acenaphthene	M	mg/kg	0.5	< 0.5	< 0.5	1.8	< 0.5	< 0.5	< 0.5
Fluorene	M	mg/kg	0.5	< 0.5	< 0.5	1.6	< 0.5	< 0.5	< 0.5
Phenanthrene	M	mg/kg	0.5	< 0.5	< 0.5	25.5	< 0.5	< 0.5	< 0.5
Anthracene	M	mg/kg	0.5	< 0.5	< 0.5	7.4	< 0.5	< 0.5	< 0.5
Fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	51.8	< 0.5	0.9	< 0.5
Pyrene	M	mg/kg	0.5	< 0.5	< 0.5	47.4	< 0.5	0.8	< 0.5
Benzo (a) anthracene	M	mg/kg	0.5	< 0.5	< 0.5	28.3	< 0.5	0.5	< 0.5
Chrysene	M	mg/kg	0.5	< 0.5	< 0.5	27.8	< 0.5	0.6	< 0.5
Benzo (b) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	23.2	< 0.5	0.5	< 0.5
Benzo (k) fluoranthene	M	mg/kg	0.5	< 0.5	< 0.5	22.2	< 0.5	0.5	< 0.5
Benzo (a) pyrene	M	mg/kg	0.5	< 0.5	< 0.5	28.3	< 0.5	0.6	< 0.5
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.5	0.6	< 0.5	19.5	< 0.5	0.8	< 0.5
Dibenzo(a,h)anthracene	M	mg/kg	0.5	< 0.5	< 0.5	4.9	< 0.5	< 0.5	< 0.5
Benzo(ghi)perylene	M	mg/kg	0.5	< 0.5	< 0.5	17.3	< 0.5	0.6	< 0.5
Total PAH(16)	M	mg/kg	2	4	< 2	309	< 2	7	< 2
BTEX									
Benzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Toluene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0
Xylenes	M	ug/kg	10	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0	< 10.0

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Results Summary

Report No.: 15-02604

ELAB Reference	31735	31736	31737	31738	31739	31740
Customer Reference						
Sample ID						
Sample Type	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location	WS2	WS2	WS6	WS6	WS7	WS7
Sample Depth (m)	0.20	0.50	0.20	0.50	0.20	0.50
Sampling Date	22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015	22/06/2015

Determinand	Codes	Units	LOD	TS	NAT	TS	NAT	MG	NAT
TPH CWG									
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	< 1.0	1.5	< 1.0	< 1.0	< 1.0	< 1.0
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	1.6	< 1.0
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	< 1.0	1.5	< 1.0	< 1.0	1.6	< 1.0
OrganoChlorine Pesticides									
alpha-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Aldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Heptachlor epoxide	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Endrin	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	n/t	n/t	n/t	n/t	n/t

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Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

Results Summary

Report No.: 15-02604

Asbestos Qualitative Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Result
31721	0.20	TP1	Silty loam	No asbestos detected
31722	0.50	TP1	Silty loam	No asbestos detected
31723	0.20	TP2	Silty loam	No asbestos detected
31724	0.20	TP3	Silty loam	No asbestos detected
31725	0.20	TP4	Silty loam	No asbestos detected
31726	0.50	TP4	Silty loam	No asbestos detected
31727	0.20	TP5	Silty loam	No asbestos detected
31729	0.20	TP6	Silty loam	No asbestos detected
31730	0.50	TP6	Silty loam	No asbestos detected
31731	0.20	TP7	Silty loam	No asbestos detected
31732	0.50	TP7	Silty loam	No asbestos detected
31733	0.20	WS1	Silty loam	No asbestos detected
31735	0.20	WS2	Silty loam	No asbestos detected
31736	0.50	WS2	Silty loam	No asbestos detected
31737	0.20	WS6	Silty loam	No asbestos detected
31738	0.50	WS6	Silty loam	No asbestos detected
31739	0.20	WS7	Silty loam	No asbestos detected
31740	0.50	WS7	Silty loam	No asbestos detected



Method Summary

Report No.: 15-02604

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Sulphide	N	As submitted sample	26/06/2015	109	Colorimetry
Hexavalent chromium	N	As submitted sample	26/06/2015	110	Colorimetry
pH	M	Air dried sample	29/06/2015	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	29/06/2015	115	Ion Chromatography
Aqua regia extractable metals	M	Air dried sample	29/06/2015	118	ICPMS
Phenols in solids	M	As submitted sample	26/06/2015	121	HPLC
Elemental Sulphur	N	Air dried sample	27/06/2015	122	HPLC
Polyaromatic hydrocarbons (GC-FID)	M	As submitted sample	26/06/2015	133	GC-FID
Water soluble anions	M	Air dried sample	27/06/2015	172	Ion Chromatography
Organochlorine Pesticides in solids	M	As submitted sample	30/06/2015	173	GC-MS
BTEX in solids	M	As submitted sample	29/06/2015	181	GC-MS
Water soluble boron	N	Air dried sample	29/06/2015	202	Colorimetry
Total cyanide	M	As submitted sample	26/06/2015	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	29/06/2015	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	26/06/2015	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	30/06/2015	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	26/06/2015	214	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	29/06/2015	214	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	29/06/2015	214	GC-MS
Asbestos identification	U	As submitted sample	26/06/2015	PMAN	Microscopy

Tests marked N are not UKAS accredited

Report Information

Report No.: 15-02604

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage



2683



Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY



THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number: 15-02661

Issue: 1

Date of Issue: 07/07/2015

Contact: Justyna Oak

Customer Details: GESL ☐
Unit 7 ☐
Danworth Farm ☐
Hurstpierpoint ☐
West Sussex

Quotation No: Q14-00021

Order No: 3630

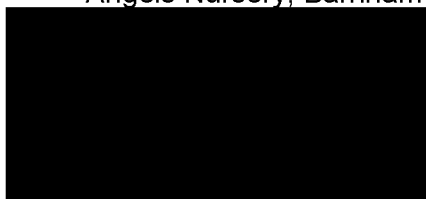
Customer Reference: GE10423

Date Received: 29/06/2015

Date Approved: 07/07/2015

Details: Angels Nursery, Barnham

Approved by:



John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683)



Sample Summary

Report No.: 15-02661

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
32159	WS4 0.20	29/06/2015	29/06/2015	Silty loam	
32160	WS5 0.20	29/06/2015	29/06/2015	Silty loam	
32161	HP1 0.20	29/06/2015	29/06/2015	Silty loam	
32162	HP2 0.20	29/06/2015	29/06/2015	Silty loam	
32163	HP3 0.20	29/06/2015	29/06/2015	Silty loam	



Results Summary

2683

Report No.: 15-02661

ELAB Reference				32159	32160	32161	32162	32163
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				WS4	WS5	HP1	HP2	HP3
Sample Depth (m)				0.20	0.20	0.20	0.20	0.20
Sampling Date				29/06/2015	29/06/2015	29/06/2015	29/06/2015	29/06/2015
Determinand	Codes	Units	LOD	TS	MG			
Metals								
Arsenic	M	mg/kg	1	7.7	7.7	n/t	n/t	n/t
Barium	M	mg/kg	10	58.4	69.0	n/t	n/t	n/t
Beryllium	U	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	n/t	n/t	n/t
Chromium	M	mg/kg	5	20.1	20.6	n/t	n/t	n/t
Copper	M	mg/kg	5	17.0	24.7	n/t	n/t	n/t
Lead	M	mg/kg	5	19.7	50.7	n/t	n/t	n/t
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	n/t	n/t	n/t
Nickel	M	mg/kg	5	14.4	14.0	n/t	n/t	n/t
Selenium	M	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
Vanadium	M	mg/kg	5	26.9	24.9	n/t	n/t	n/t
Zinc	M	mg/kg	45	55.6	107	n/t	n/t	n/t
Anions								
Water Soluble Chloride	M	mg/kg	40	< 40	49	n/t	n/t	n/t
Water Soluble Sulphate	M	g/l	0.02	0.02	0.03	n/t	n/t	n/t
Inorganics								
Elemental Sulphur	N	mg/kg	20	< 20	< 20	n/t	n/t	n/t
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	n/t	n/t	n/t
Total Sulphide	N	mg/kg	2	< 2	< 2	n/t	n/t	n/t
Total Cyanide	M	mg/kg	1	< 1.0	1.1	n/t	n/t	n/t
Acid Soluble Sulphate (SO4)	U	%SO4	0.02	0.02	0.04	n/t	n/t	n/t
Water Soluble Boron	N	mg/kg	0.5	0.6	1.9	n/t	n/t	n/t
Miscellaneous								
Acid Neutralisation Capacity	N	mol/kg	0.1	n/t	n/t	0.1	< 0.1	< 0.1
Loss On Ignition (450°C)	M	%	0.01	n/t	n/t	3.35	2.56	4.75
pH	M	units	0.1	7.7	7.8	11.4	8.3	8.1
Total Organic Carbon	N	%	0.01	0.39	2.3	0.93	0.53	1.4
Phenols								
Total Phenols	N	mg/kg	6	< 6	< 6	n/t	n/t	n/t
Polyaromatic hydrocarbons								
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Fluorene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Phenanthrene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Anthracene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Fluoranthene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Pyrene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Benzo (a) anthracene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Chrysene	M	mg/kg	0.1	0.3	0.9	n/t	n/t	n/t
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Benzo (k) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Benzo (a) pyrene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.5	n/t	n/t	n/t
Benzo(ghi)perylene	M	mg/kg	0.1	0.2	< 0.5	n/t	n/t	n/t
Total PAH(16)	M	mg/kg	0.4	< 0.4	4	n/t	n/t	n/t
Total PAH (Including Coronene)	N	mg/kg	2	n/t	n/t	19	5	< 2

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The Environmental Laboratory Ltd. Reg. No. 3882193



Results Summary

Report No.: 15-02661

2683

ELAB Reference				32159	32160	32161	32162	32163
Customer Reference								
Sample ID								
Sample Type				SOIL	SOIL	SOIL	SOIL	SOIL
Sample Location				WS4	WS5	HP1	HP2	HP3
Sample Depth (m)				0.20	0.20	0.20	0.20	0.20
Sampling Date				29/06/2015	29/06/2015	29/06/2015	29/06/2015	29/06/2015
Determinand	Codes	Units	LOD	TS	MG			
BTEX								
Benzene	M	ug/kg	10	< 10.0	< 10.0	n/t	n/t	n/t
Toluene	M	ug/kg	10	< 10.0	< 10.0	n/t	n/t	n/t
Ethylbenzene	M	ug/kg	10	< 10.0	< 10.0	n/t	n/t	n/t
Xylenes	M	ug/kg	10	< 10.0	< 10.0	n/t	n/t	n/t
Total BTEX	M	mg/kg	0.01	n/t	n/t	< 0.01	< 0.01	< 0.01
TPH CWG								
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	n/t	n/t
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	n/t	n/t
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
>C21-C35 Aliphatic	N	mg/kg	1	1.9	4.6	n/t	n/t	n/t
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	n/t	n/t
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	n/t	n/t	n/t
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
>C21-C35 Aromatic	N	mg/kg	1	< 1.0	1.4	n/t	n/t	n/t
>C35-C40 Aromatic	N	mg/kg	1	< 1.0	< 1.0	n/t	n/t	n/t
Total (>C5-C40) Ali/Aro	N	mg/kg	1	1.9	6.0	n/t	n/t	n/t
Total Petroleum Hydrocarbons								
Mineral Oil	U	mg/kg	5	n/t	n/t	700	294	< 5
PCB (ICES 7 congeners)								
PCB (Total of 7 Congeners)	M	mg/kg	0.03	n/t	n/t	< 0.03	< 0.03	< 0.03
OrganoChlorine Pesticides								
alpha-HCH	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
beta_HCH	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
gamma-HCH	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
delta-HCH	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Heptachlor	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Aldrin	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Heptachlor expoxide	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
trans-Chlordane	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
alpha cis-Chlordane	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
p,p-DDE	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Dieldrin	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Endrin	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
p,p-DDD	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Endosulfan II	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Endrin aldehyde	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
p,p-DDT	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Endosulphan sulphate	M	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Methoxychlor	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t
Endrin ketone	N	ug/kg	10	n/t	< 10	n/t	n/t	n/t

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The Environmental Laboratory Ltd. Reg. No. 3882193



Results Summary

2683

Report No.: 15-02661

WAC Analysis

Elab Ref:	32163					Landfill Waste Acceptance Criteria Limits		
Sample Date:	29/06/2015					Inert Waste Landfill	Stable Non-reactive Hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:	HP3							
Depth:	0.2							
Site:	Angels Nursery, Barnham							
Determinand		Code	Units					
Total Organic Carbon		N	%		1.40	3	5	6
Loss on Ignition		M	%		4.8	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		< 5	500	--	--
Total (of 17) PAHs		N	mg/kg		< 2	100	--	--
pH		M			8.1	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			2:1	8:1	10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
			mg/l	mg/l	mg/kg			
Arsenic		N	0.005	< 0.005	< 0.05	0.5	2	25
Barium		N	0.017	0.006	0.07	20	100	300
Cadmium		N	< 0.001	< 0.001	< 0.01	0.04	1	5
Chromium		N	< 0.005	< 0.005	< 0.05	0.5	10	70
Copper		N	0.014	0.006	0.07	2	50	100
Mercury		N	< 0.005	< 0.005	< 0.01	0.01	0.2	2
Molybdenum		N	< 0.005	< 0.005	< 0.05	0.5	10	30
Nickel		N	0.004	0.002	< 0.05	0.4	10	40
Lead		N	< 0.001	< 0.001	< 0.05	0.5	10	50
Antimony		N	< 0.005	< 0.005	< 0.05	0.06	0.7	5
Selenium		N	< 0.005	< 0.005	< 0.05	0.1	0.5	7
Zinc		N	0.008	0.006	0.06	4	50	200
Chloride		N	6.000	< 5	< 50	800	15000	25000
Fluoride		N	< 1	< 1	< 10	10	150	500
Sulphate		N	5.000	4.000	36.90	1000	20000	50000
Total Dissolved Solids		N	210.000	< 10	194.00	4000	60000	100000
Phenol Index		N	< 0.01	< 0.01	< 0.10	1	-	-
Dissolved Organic Carbon		N	28.000	12.700	142.00	500	800	1000
Leach Test Information								
Eluent Volume (ml)		N	163	1400				
pH		N	8.6	7.5				
Conductivity (uS/cm)		N	317	158				
Temperature (°C)		N	20	19				
Solid Information								
Dry mass of test portion (g)			177					
Moisture (%)			16.6					

Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ELAB cannot be held responsible for any discrepancies with current legislation



2683

Results Summary

Report No.: 15-02661

WAC Analysis

Elab Ref:	32162					Landfill Waste Acceptance Criteria Limits		
Sample Date:	29/06/2015					Inert Waste Landfill	Stable Non-reactive Hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:	HP2							
Depth:	0.2							
Site:	Angels Nursery, Barnham							
Determinand		Code	Units					
Total Organic Carbon		N	%		0.53	3	5	6
Loss on Ignition		M	%		2.6	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		294	500	--	--
Total (of 17) PAHs		N	mg/kg		5.0	100	--	--
pH		M			8.3	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		< 0.1	--	To evaluate	To evaluate
Eluate Analysis			2:1	8:1	10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
			mg/l	mg/l	mg/kg			
Arsenic		N	< 0.005	< 0.005	< 0.05	0.5	2	25
Barium		N	0.018	< 0.005	< 0.05	20	100	300
Cadmium		N	< 0.001	< 0.001	< 0.01	0.04	1	5
Chromium		N	< 0.005	< 0.005	< 0.05	0.5	10	70
Copper		N	0.044	0.007	0.11	2	50	100
Mercury		N	< 0.005	< 0.005	< 0.01	0.01	0.2	2
Molybdenum		N	0.014	< 0.005	< 0.05	0.5	10	30
Nickel		N	0.005	0.002	< 0.05	0.4	10	40
Lead		N	< 0.001	< 0.001	< 0.05	0.5	10	50
Antimony		N	< 0.005	< 0.005	< 0.05	0.06	0.7	5
Selenium		N	< 0.005	< 0.005	< 0.05	0.1	0.5	7
Zinc		N	0.006	< 0.005	< 0.05	4	50	200
Chloride		N	9.000	< 5	< 50	800	15000	25000
Fluoride		N	< 1	< 1	< 10	10	150	500
Sulphate		N	11.000	3.000	41.40	1000	20000	50000
Total Dissolved Solids		N	380.000	< 10	399.00	4000	60000	100000
Phenol Index		N	< 0.01	< 0.01	< 0.10	1	-	-
Dissolved Organic Carbon		N	95.900	12.300	211.00	500	800	1000
Leach Test Information								
Eluent Volume (ml)		N	185	1400				
pH		N	8.1	7.5				
Conductivity (uS/cm)		N	309	110				
Temperature (°C)		N	21	19				
Solid Information								
Dry mass of test portion (g)			176					
Moisture (%)			7.8					

Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ELAB cannot be held responsible for any discrepancies with current legislation



2683

Results Summary

Report No.: 15-02661

WAC Analysis

Elab Ref:	32161					Landfill Waste Acceptance Criteria Limits		
Sample Date:	29/06/2015					Inert Waste Landfill	Stable Non-reactive Hazardous waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID:	HP1							
Depth:	0.2							
Site:	Angels Nursery, Barnham							
Determinand		Code	Units					
Total Organic Carbon		N	%		0.93	3	5	6
Loss on Ignition		M	%		3.4	--	--	10
Total BTEX		M	mg/kg		< 0.01	6	--	--
Total PCBs (7 congeners)		M	mg/kg		< 0.03	1	--	--
TPH Total WAC		M	mg/kg		700	500	--	--
Total (of 17) PAHs		N	mg/kg		19.0	100	--	--
pH		M			11.4	--	>6	--
Acid Neutralisation Capacity		N	mol/kg		0.1	--	To evaluate	To evaluate
Eluate Analysis			2:1	8:1	10:1	Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 l/kg		
			mg/l	mg/l	mg/kg			
Arsenic		N	0.006	< 0.005	< 0.05	0.5	2	25
Barium		N	0.014	0.006	0.07	20	100	300
Cadmium		N	< 0.001	< 0.001	< 0.01	0.04	1	5
Chromium		N	< 0.005	< 0.005	< 0.05	0.5	10	70
Copper		N	0.014	0.008	0.08	2	50	100
Mercury		N	< 0.005	< 0.005	< 0.01	0.01	0.2	2
Molybdenum		N	0.013	< 0.005	< 0.05	0.5	10	30
Nickel		N	0.004	0.002	< 0.05	0.4	10	40
Lead		N	< 0.001	< 0.001	< 0.05	0.5	10	50
Antimony		N	< 0.005	< 0.005	< 0.05	0.06	0.7	5
Selenium		N	< 0.005	< 0.005	< 0.05	0.1	0.5	7
Zinc		N	0.006	< 0.005	< 0.05	4	50	200
Chloride		N	8.000	< 5	< 50	800	15000	25000
Fluoride		N	< 1	< 1	< 10	10	150	500
Sulphate		N	26.000	5.000	71.50	1000	20000	50000
Total Dissolved Solids		N	180.000	< 10	216.00	4000	60000	100000
Phenol Index		N	< 0.01	< 0.01	< 0.10	1	-	-
Dissolved Organic Carbon		N	25.900	8.350	105.00	500	800	1000
Leach Test Information								
Eluent Volume (ml)		N	210	1390				
pH		N	7.7	7.4				
Conductivity (uS/cm)		N	287	134				
Temperature (°C)		N	21	19				
Solid Information								
Dry mass of test portion (g)			175					
Moisture (%)			7.9					

Results are expressed on a dry weight basis, after correction for moisture content where applicable

Stated limits are for guidance only and ELAB cannot be held responsible for any discrepancies with current legislation



Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
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Results Summary

Report No.: 15-02661

Asbestos Qualitative Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) ☐ in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Result
32159	0.20	WS4	Silty loam	No asbestos detected
32160	0.20	WS5	Silty loam	No asbestos detected

Method Summary

Report No.: 15-02661

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Anions in 2:1 WAC	N		06/07/2015		
DOC in 2:1 WAC	N		07/07/2015		
Metals by ICP in 2:1 WAC	N		06/07/2015		
Phenols in 2:1 WAC	N		07/07/2015		
Polyaromatic hydrocarbons in solids	N	As submitted sample	02/07/2015		GC-FID
Sulphide	N	As submitted sample	01/07/2015	109	Colorimetry
Hexavalent chromium	N	As submitted sample	01/07/2015	110	Colorimetry
pH	M	Air dried sample	01/07/2015	113	Electromeric
Acid Soluble Sulphate	U	Air dried sample	02/07/2015	115	Ion Chromatography
Total Petroleum Hydrocarbons in solids	U	As submitted sample	01/07/2015	117	GC-FID
Aqua regia extractable metals	M	Air dried sample	01/07/2015	118	ICPMS
PCB (ICES 7 congeners)	M	Air dried sample	03/07/2015	120	GC-MS
Phenols in solids	M	As submitted sample	01/07/2015	121	HPLC
Elemental Sulphur	N	Air dried sample	01/07/2015	122	HPLC
Loss on ignition at 450 deg C	M	Air dried sample	02/07/2015	129	Gravimetry
Polyaromatic hydrocarbons (GC-FID)	M	As submitted sample	01/07/2015	133	GC-FID
Water soluble anions	M	Air dried sample	01/07/2015	172	Ion Chromatography
Organochlorine Pesticides in solids	M	As submitted sample	01/07/2015	173	GC-MS
BTEX in solids	M	As submitted sample	02/07/2015	181	GC-MS
Water soluble boron	N	Air dried sample	01/07/2015	202	Colorimetry
Total cyanide	M	As submitted sample	01/07/2015	204	Colorimetry
Total organic carbon/Total sulphur	N	Air dried sample	02/07/2015	210	IR
Aliphatic hydrocarbons in soil	N	As submitted sample	01/07/2015	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	02/07/2015	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	01/07/2015	214	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	02/07/2015	214	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	02/07/2015	214	GC-MS
Acid neutralisation capacity	N	Air dried sample	02/07/2015	737	
Asbestos identification	U	As submitted sample	02/07/2015	PMAN	Microscopy

Leachate

Tests marked N are not UKAS accredited



Report Information

Report No.: 15-02661

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis

Comments or interpretations are beyond the scope of UKAS accreditation

The results relate only to the items tested

PCB congener results may include any coeluting PCBs

Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

-
- | | |
|---|--|
| a | No date of sampling supplied |
| b | No time of sampling supplied (Waters Only) |
| c | Sample not received in appropriate containers |
| d | Sample not received in cooled condition |
| e | The container has been incorrectly filled |
| f | Sample age exceeds stability time (sampling to receipt) |
| g | Sample age exceeds stability time (sampling to analysis) |

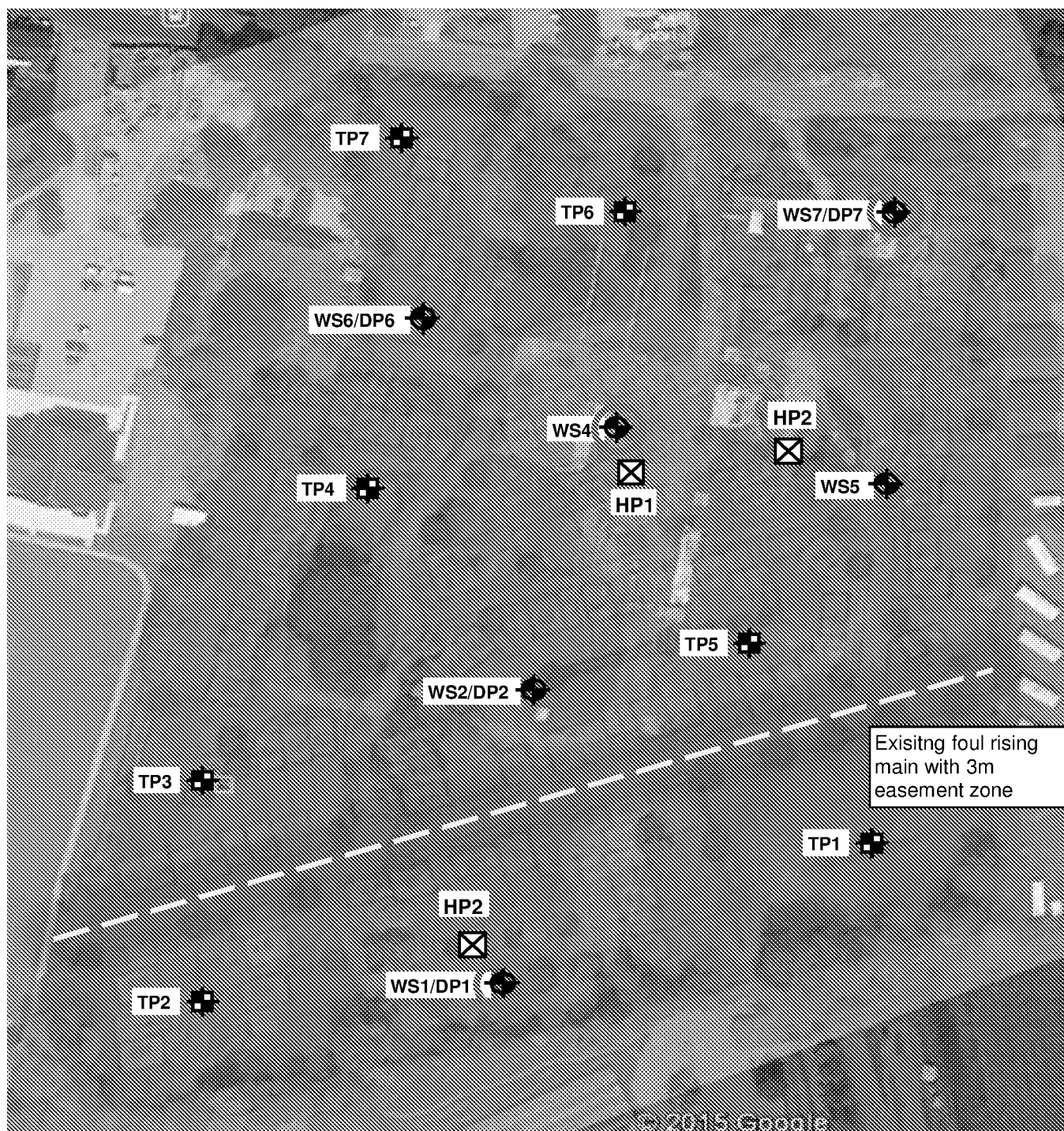
Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month

All water samples will be retained for 7 days following the date of the test report

Charges may apply to extended sample storage



Standpipe locations

Project:	Angels Nursery, Barnham			Title:	Site Investigation Plan		
Address:	Yapton Road, Barnham, West Sussex, PO22 0AY			Date:	15/06/2015	Revision:	v1
				Drawn:	JO	 Geo-Environmental	
Grid Ref:		Scale:	Not to Scale	Ref:	GE10423		
Client:	Lovell Partnerships Ltd			Figure:	2		

Inorganic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)
Arsenic	37
Cadmium	11
Chromium (III)	910
Chromium (VI)	6
Lead	200
Mercury	1.2
Nickel	180
Selenium	250
Copper	2400
Zinc	3700

Organic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Naphthalene	2.3	5.6	13
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Fluorene	170	400	860
Phenanthrene	95	220	440
Anthracene	2400	5400	11000
Fluoranthene	280	560	890
Pyrene	620	1200	2000
Benzo(a)anthracene	7.2	11	13
Chrysene	15	22	27
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(k)fluoranthene	77	93	100
Benzo(a)pyrene	2.2	2.7	3.0
Dibenz(a,h)anthracene	0.24	0.28	0.3
Indeno(1,2,3-cd)pyrene	27	36	41
Benzo(g,h,i)perylene	320	340	350
Benzene	0.087	0.17	0.37
Toluene	130	290	660
Ethylbenzene	47	110	260
o-Xylene	60	140	330
m-Xylene	59	140	320
p-Xylene	56	130	310

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Prepared	RAN	Checked	CAT	Date	20/01/20	Job No	44161
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 Eastwood & Partners CONSULTING ENGINEERS St Andrew's House 23 Kingfield Road Sheffield S11 9AS	ANGEL'S & HYDE NURSERIES, BARNHAM REDROW HOMES ASSESSMENT CRITERIA – RESIDENTIAL WITH HOMEGROWN PRODUCE
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Contaminant	Phytotoxicity			
	pH 5.0 to 5.5	pH 5.5 to 6.0	pH 6.0 to 6.5	pH >7.0
Arsenic	50			
Cadmium	3			
Chromium	400			
Lead	300			
Mercury	1			
Nickel	50	60	75	110
Copper	80	100	135	200
Zinc	200	200	200	300

The assessment concentration for lead is the Category 4 Screening Level produced by Contaminated Land: Applications in Real Environments (CL:AIRE) and outlined in Appendix H of their report SP1010. The others have been taken from Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R., and Nathanail, J., 2015, *'The LQM/CIEH S4ULs for Human Health Risk Assessment'*, Land Quality Press, Nottingham. The metals/metalloids are based on a sandy loam soil and 6% soil organic matter. The assessment values are not intended to be applied to individual sample results where materials are similar, as the levels of contaminants will have a natural variability across the site. Instead, the modified mean value should be compared with the assessment concentration.

The assessment values for phytotoxicity are the levels at which plant growth is thought to be affected. They are taken from the maximum permissible and advisable concentrations in soil after application of soil sludge given in the *'The Code of Good Agricultural Practice for the Protection of Soil'*, MAFF, 1998.

The assessment of sulphate, water soluble sulphate, elemental sulphur and sulphide is to determine the aggressive nature of the ground with respect to concrete and consequently the results are compared with BRE Special Digest 1:2005 *'Concrete in Aggressive Ground'*.

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Mitchell Garrington
Redrow Homes
Faraday Office Park
Basingstoke
Hampshire
RG24 8QQ

CAT/SDP/RAN/44161-005

22 September 2020

Dear Mitchell,

Barnham, Windmill Views: Response to NHBC condition LQ1

Introduction

NHBC Land Quality condition 1 for this site relates to the requirement for a remediation report/strategy and verification plan.

No remediation was considered to be required as a result of chemical contamination in the topsoil, however the topsoil in some areas of the site was found to contain deleterious material including glass. This is thought to be a result of the dismantling of former greenhouses which occupied the site.

Remedial Proposals

A sketch plan showing the likely maximum extent of topsoil containing deleterious material is enclosed.

Site levels are due to be raised by at least 450 mm, it is therefore proposed that the topsoil across the affected area remains in place across gardens and landscaped areas. In these areas, a woven geotextile should be placed over the topsoil containing deleterious material, before placing the clean soil required to increase the levels to achieve the proposed finished levels. The natural ground across the site, as well as the topsoil outside the affected area is considered both chemically and physically suitable for re-use across garden and landscaped areas, and it is not therefore anticipated that additional material will need to be imported for this purpose. However, should additional soil be required, it should be from a source not expected to be contaminated and meet both physical and chemical criteria, as detailed below.

Any unsuitable topsoil which is present below areas of proposed hardstanding or plots is not considered appropriate to remain due to the potential for settlement. Therefore topsoil in these areas should be removed prior to construction. It can then be placed in garden or soft

Directors: P Richardson BSc, CEng, MICE, MStructE S R Ellis BEng, CEng, MStructE, MICE K R Pursall BEng, CEng, MStructE
C A Topliss BSc, CEnv, CSci, CGeol, SiLC, MICE, FGS S J English BEng, CEng, MStructE A R Priest BEng
Technical Director: A G Marshall BEng, CEng, MStructE
Senior Associates: S J Mitchell BSc, MSc, CEng, MEI, MCIBSE, MASHRAE A Allison BEng
M Young MA, CEng, MICE, MStructE C A Wood BSc, CEng, MStructE, MICE
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M P Chappell BEng, IEng, AMStructE M Dyson BSc, CEng, MStructE A M Cross MEng, CEng, MICE A Lavelle MEng, CEng, MICE
Consultant: S D Preston BEng, CEng, FICE, FStructE

landscaped areas, and topped with the geotextile and at least 450 mm of clean soil, as described above.

A detailed record of the movement of unsuitable topsoil will need to be maintained.

Imported Soil

Prior to importation, certification should be obtained from the supplier detailing the source site, its previous and current land use and relevant test results. A copy of this should also be forwarded to the engineer. For the topsoil the supplier will also need to provide certification to demonstrate that it meets the criteria for classification as multi-purpose topsoil under the British Standard '*Specification for topsoil and requirements for use*', BS3882:2007.

Physical Requirements for Imported Soil

Subsoil should comprise clay or sand. Topsoil should have a maximum of 30% of fragments in excess of 2 mm, a maximum of 10% in excess of 20 mm and nothing greater than 50 mm. Subsoil should have a maximum of 60% of fragments in excess of 2 mm, a maximum of 30% in excess of 20 mm and a maximum of 10% in excess of 50 mm, with nothing in excess of 75 mm. This is to be confirmed by visual inspection of the material by a suitably qualified geo-environmental engineer.

Topsoil should be free of fragments of glass, brick, concrete, wire or other potentially hazardous foreign material which could cause traumatic injury. Reasonable judgement should be taken with respect to their presence in subsoil. In addition, all materials should be free from propagules of aggressive weeds and bulk vegetative growth, in order to ensure negligible risk of subsequent weed problems.

Chemical Requirements for Imported Soil

At least three samples should be tested for each stockpile, although may be reduced to two samples for stockpiles of less than 50 m³ for topsoil and 100 m³ for subsoil. This is to be undertaken by a suitably qualified geo-environmental engineer and depending on the source or variability of imported material, the engineer may, at their discretion, request additional testing to be undertaken. If constant sources are to be used for the topsoil and subsoil and the results recorded are consistently low, consideration may be given to reducing the number of samples tested.

Testing should be carried out for the following general suite of contaminants:

Arsenic	Mercury	Zinc
Chromium	Nickel	Speciated Polycyclic Aromatic Hydrocarbons
Copper	Cadmium	Water soluble sulphate (Subsoil only)
Lead	Selenium	pH

The results are to be compared with the current contaminated land assessment criteria for residential development. Tables of all of the assessment concentrations applicable are enclosed.

If any of the assessment concentrations are exceeded the material shall be considered to be unsuitable unless further testing and risk assessment shows it to be satisfactory.

Verification of the Capping Installation

Upon completion of the capping layer in plots located across the area of unsuitable topsoil, as well as any plots where the unsuitable topsoil was placed following removal from below plots or areas of hardstanding, verification pits shall be dug by an independent engineer in order to measure the thickness of clean soil, and confirm the presence of the geotextile marker layer. These pits should be excavated at a rate of one pit per three plots for private dwellings. Some of the pits will be completed in the landscaped areas to the front of the properties as well as the rear gardens. Any communal landscaped areas should also be covered at a rate of one per 300 m².

If the capping is deemed to be insufficient, the site manager will be informed and advised on how much more material is needed for the capping to be adequate. Verification of capping can only be carried out on areas where the capping has been completed.

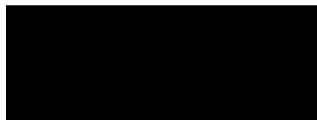
A verification report is to be produced by the engineer, which includes:

- Information on the source of any imported soil;

-
- The chemical test results for the samples taken from the stockpiles of topsoil and subsoil and confirmation that the material is visually consistent with that tested or the chemical test results for samples taken once the capping has been placed;
 - Confirmation of the capping thicknesses, including photographs of the verification pits with a scaled marker;
 - Confirmation of the physical suitability of the material

The verification reports detailing the capping of garden and landscaped areas will be submitted to the NHBC to enable Land Quality Conditions to be lifted as plots are completed, and will be issued to the Local Authority at the same time.

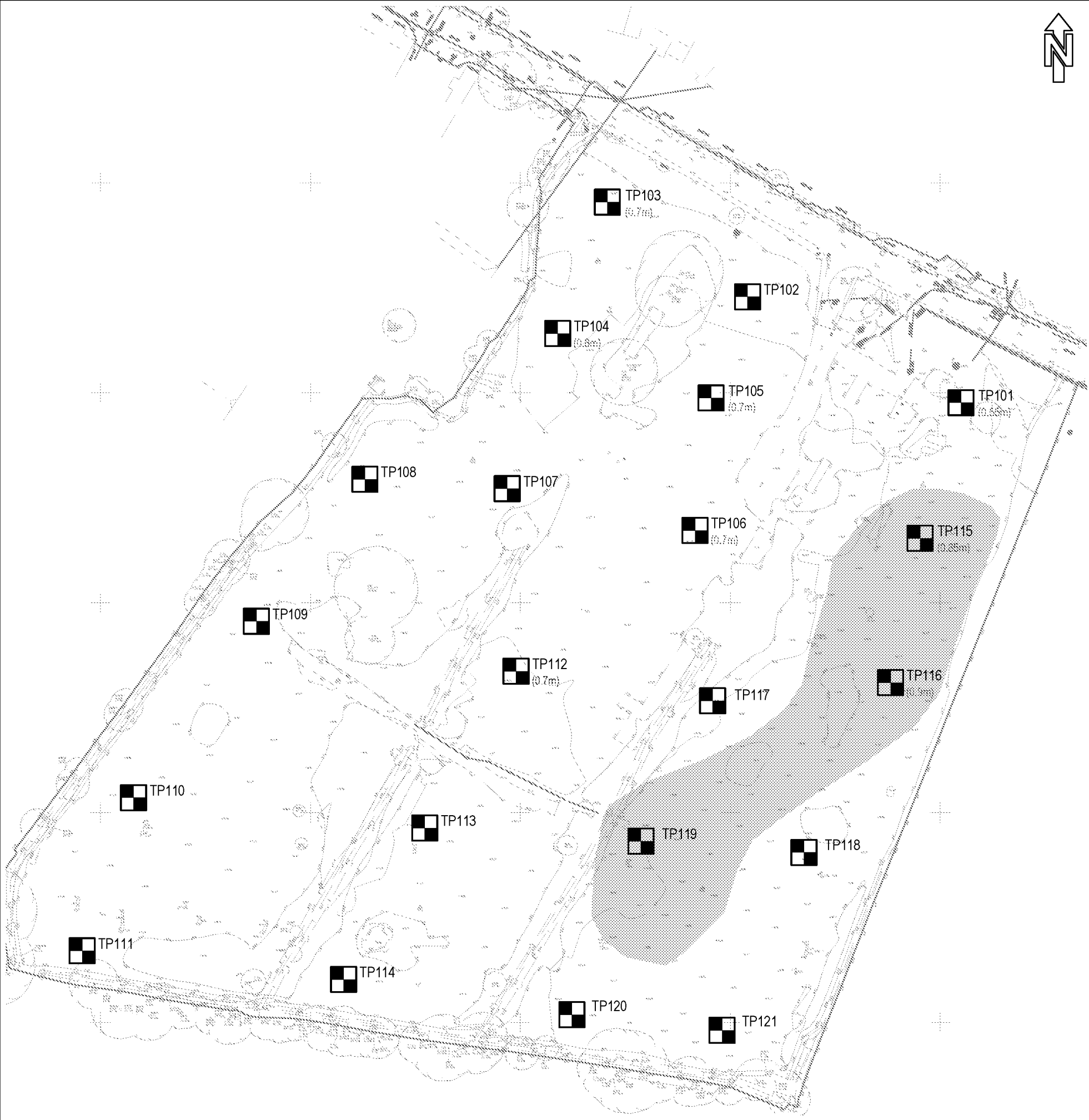
Regards,



Stephen Preston

Consultant

Enc. Sketch plan – ‘Exploratory Hole Location Plan Showing Deleterious Topsoil
Assessment Criteria – Residential with Homegrown Produce



INFORMATION WITHIN THIS DRAWING IS NOT NECESSARILY PRODUCED TO SCALE.
ALWAYS USE FIGURED DIMENSIONS AND CO-ORDINATES - IF IN DOUBT, ASK.

KEY:

-  Approximate location of topsoil / made ground sampling location carried out by Eastwood & Partners on 16.12.19.
-  (0.7m) Approximate depth of made / re-worked ground.
-  (0.7m) Approximate depth of possible made / re-worked ground.
-  Approximate maximum extent of topsoil containing deleterious material.

A	First Issue.			
REV	DESCRIPTION	SIG	CHK	DATE

REDROW HOMES LTD

ANGEL'S & HYDE NURSERIES,
YAPTON ROAD, BARNHAM

EXPLORATORY HOLE LOCATION PLAN
SHOWING DELETERIOUS TOPSOIL

Eastwood & Partners
CONSULTING ENGINEERS



St. Andrew's House
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Sheffield
S11 9AS

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SCALE WHEN PLOTTED AT AS			DRAWING STATUS		
1:1000			INFORMATION		
DRAWN	CHECKED	21.01.20	44161 / 050	NUMBER	REV
RH	RAN				A

SKETCH ONLY

Inorganic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)
Arsenic	37
Cadmium	11
Chromium (III)	910
Chromium (VI)	6
Lead	200
Mercury	1.2
Nickel	180
Selenium	250
Copper	2400
Zinc	3700

Organic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Naphthalene	2.3	5.6	13
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Fluorene	170	400	860
Phenanthrene	95	220	440
Anthracene	2400	5400	11000
Fluoranthene	280	560	890
Pyrene	620	1200	2000
Benzo(a)anthracene	7.2	11	13
Chrysene	15	22	27
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(k)fluoranthene	77	93	100
Benzo(a)pyrene	2.2	2.7	3.0
Dibenz(a,h)anthracene	0.24	0.28	0.3
Indeno(1,2,3-cd)pyrene	27	36	41
Benzo(g,h,i)perylene	320	340	350
Benzene	0.087	0.17	0.37
Toluene	130	290	660
Ethylbenzene	47	110	260
o-Xylene	60	140	330
m-Xylene	59	140	320
p-Xylene	56	130	310

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Contaminant	Phytotoxicity			
	pH 5.0 to 5.5	pH 5.5 to 6.0	pH 6.0 to 6.5	pH >7.0
Arsenic	50			
Cadmium	3			
Chromium	400			
Lead	300			
Mercury	1			
Nickel	50	60	75	110
Copper	80	100	135	200
Zinc	200	200	200	300

The assessment concentration for lead is the Category 4 Screening Level produced by Contaminated Land: Applications in Real Environments (CL:AIRE) and outlined in Appendix H of their report SP1010. The others have been taken from Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R., and Nathanail, J., 2015, *'The LQM/CIEH S4ULs for Human Health Risk Assessment'*, Land Quality Press, Nottingham. The metals/metalloids are based on a sandy loam soil and 6% soil organic matter. The assessment values are not intended to be applied to individual sample results where materials are similar, as the levels of contaminants will have a natural variability across the site. Instead, the modified mean value should be compared with the assessment concentration.

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The assessment of sulphate, water soluble sulphate, elemental sulphur and sulphide is to determine the aggressive nature of the ground with respect to concrete and consequently the results are compared with BRE Special Digest 1:2005 *'Concrete in Aggressive Ground'*.

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Prepared	RAN	Checked	CAT	Date	20/01/20	Job No	44161
 Eastwood & Partners CONSULTING ENGINEERS St Andrew's House 23 Kingfield Road Sheffield S11 9AS				ANGEL'S & HYDE NURSERIES, BARNHAM REDROW HOMES ASSESSMENT CRITERIA – RESIDENTIAL WITH HOMEGROWN PRODUCE			

Mitchell Garrington
Redrow Homes
Faraday Office Park
Basingstoke
Hampshire
RG24 8QQ

CAT/RAN/44161-008

5 October 2021

Dear Mitchell,

Barnham, Windmill Views: Required Remedial Measures

Eastwood & Partners were requested to provide a summary of the plots requiring remedial measures at the above site.

Our letter dated 22 September 2020, ref CAT/SDP/RAN/44161-005 (a copy of which is enclosed), outlines the capping requirements as a result of unsuitable topsoil encountered at the site. This confirms that plots 3-4, 6-7, 9-15, 33-42 and 47-49 require a 450 mm capping layer with a geotextile marker layer at the base.

Following the issue of this letter, asbestos fragments were encountered in the soil in the vicinity of plots 12 to 15 and as a result, the capping layer thickness was increased to 600 mm, including an anti-dig layer at the base for these plots. The attached plans show the extent of plots requiring the increased capping layer, and also a section showing the required capping layer in these plots.

No remedial measures were considered to be required in any other plots other than those listed above.

Yours sincerely



Ruth Noble

Associate

Enc. Letter ref CAT/SDP/RAN/44161-005
Drawing 44161/100 – Asbestos Affected Plots
Drawing 44161/SK02 – Section Through Proposed Capping Layer Over Asbestos Affected Soil

Directors: P Richardson BSc CEng MICE FISTructE S R Ellis BEng CEng MISTructE MICE C A Topliss BSc CEnv CSci CGeol SILC MICE FGS
S J English BEng CEng MISTructE A R Priest BEng A G Marshall BEng CEng MISTructE
Technical Directors: A Allison BEng M P Chappell BEng IEng AMISTructE K Edwards MSc CGeol FGS
P A Harrison BEng CEng MISTructE C Hodge EngTech MICE A J Kerslake BEng FGS
Senior Associates: C A Wood BSc CEng MISTructE, MICE M Dyson BSc CEng MISTructE
Associates: A M Cross MEng CEng MICE A Lavelle MEng CEng MICE S R Jackson MEng CEng MISTructE R A Noble BSc FGS
Consultants: S D Preston BEng CEng FICE FISTructE K R Pursall BEng CEng MISTructE S J Mitchell BSc MSc CEng MEI MCIBSE MASHRAE

Mitchell Garrington
Redrow Homes
Faraday Office Park
Basingstoke
Hampshire
RG24 8QQ

CAT/SDP/RAN/44161-005

22 September 2020

Dear Mitchell,

Barnham, Windmill Views: Response to NHBC condition LQ1

Introduction

NHBC Land Quality condition 1 for this site relates to the requirement for a remediation report/strategy and verification plan.

No remediation was considered to be required as a result of chemical contamination in the topsoil, however the topsoil in some areas of the site was found to contain deleterious material including glass. This is thought to be a result of the dismantling of former greenhouses which occupied the site.

Remedial Proposals

A sketch plan showing the likely maximum extent of topsoil containing deleterious material is enclosed.

Site levels are due to be raised by at least 450 mm, it is therefore proposed that the topsoil across the affected area remains in place across gardens and landscaped areas. In these areas, a woven geotextile should be placed over the topsoil containing deleterious material, before placing the clean soil required to increase the levels to achieve the proposed finished levels. The natural ground across the site, as well as the topsoil outside the affected area is considered both chemically and physically suitable for re-use across garden and landscaped areas, and it is not therefore anticipated that additional material will need to be imported for this purpose. However, should additional soil be required, it should be from a source not expected to be contaminated and meet both physical and chemical criteria, as detailed below.

Any unsuitable topsoil which is present below areas of proposed hardstanding or plots is not considered appropriate to remain due to the potential for settlement. Therefore topsoil in these areas should be removed prior to construction. It can then be placed in garden or soft

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M P Chappell BEng, IEng, AMStructE M Dyson BSc, CEng, MStructE A M Cross MEng, CEng, MICE A Lavelle MEng, CEng, MICE

Consultant: S D Preston BEng, CEng, FICE, FStructE

landscaped areas, and topped with the geotextile and at least 450 mm of clean soil, as described above.

A detailed record of the movement of unsuitable topsoil will need to be maintained.

Imported Soil

Prior to importation, certification should be obtained from the supplier detailing the source site, its previous and current land use and relevant test results. A copy of this should also be forwarded to the engineer. For the topsoil the supplier will also need to provide certification to demonstrate that it meets the criteria for classification as multi-purpose topsoil under the British Standard '*Specification for topsoil and requirements for use*', BS3882:2007.

Physical Requirements for Imported Soil

Subsoil should comprise clay or sand. Topsoil should have a maximum of 30% of fragments in excess of 2 mm, a maximum of 10% in excess of 20 mm and nothing greater than 50 mm. Subsoil should have a maximum of 60% of fragments in excess of 2 mm, a maximum of 30% in excess of 20 mm and a maximum of 10% in excess of 50 mm, with nothing in excess of 75 mm. This is to be confirmed by visual inspection of the material by a suitably qualified geo-environmental engineer.

Topsoil should be free of fragments of glass, brick, concrete, wire or other potentially hazardous foreign material which could cause traumatic injury. Reasonable judgement should be taken with respect to their presence in subsoil. In addition, all materials should be free from propagules of aggressive weeds and bulk vegetative growth, in order to ensure negligible risk of subsequent weed problems.

Chemical Requirements for Imported Soil

At least three samples should be tested for each stockpile, although may be reduced to two samples for stockpiles of less than 50 m³ for topsoil and 100 m³ for subsoil. This is to be undertaken by a suitably qualified geo-environmental engineer and depending on the source or variability of imported material, the engineer may, at their discretion, request additional testing to be undertaken. If constant sources are to be used for the topsoil and subsoil and the results recorded are consistently low, consideration may be given to reducing the number of samples tested.

Testing should be carried out for the following general suite of contaminants:

Arsenic	Mercury	Zinc
Chromium	Nickel	Speciated Polycyclic Aromatic Hydrocarbons
Copper	Cadmium	Water soluble sulphate (Subsoil only)
Lead	Selenium	pH

The results are to be compared with the current contaminated land assessment criteria for residential development. Tables of all of the assessment concentrations applicable are enclosed.

If any of the assessment concentrations are exceeded the material shall be considered to be unsuitable unless further testing and risk assessment shows it to be satisfactory.

Verification of the Capping Installation

Upon completion of the capping layer in plots located across the area of unsuitable topsoil, as well as any plots where the unsuitable topsoil was placed following removal from below plots or areas of hardstanding, verification pits shall be dug by an independent engineer in order to measure the thickness of clean soil, and confirm the presence of the geotextile marker layer. These pits should be excavated at a rate of one pit per three plots for private dwellings. Some of the pits will be completed in the landscaped areas to the front of the properties as well as the rear gardens. Any communal landscaped areas should also be covered at a rate of one per 300 m².

If the capping is deemed to be insufficient, the site manager will be informed and advised on how much more material is needed for the capping to be adequate. Verification of capping can only be carried out on areas where the capping has been completed.

A verification report is to be produced by the engineer, which includes:

- Information on the source of any imported soil;

-
- The chemical test results for the samples taken from the stockpiles of topsoil and subsoil and confirmation that the material is visually consistent with that tested or the chemical test results for samples taken once the capping has been placed;
 - Confirmation of the capping thicknesses, including photographs of the verification pits with a scaled marker;
 - Confirmation of the physical suitability of the material

The verification reports detailing the capping of garden and landscaped areas will be submitted to the NHBC to enable Land Quality Conditions to be lifted as plots are completed, and will be issued to the Local Authority at the same time.

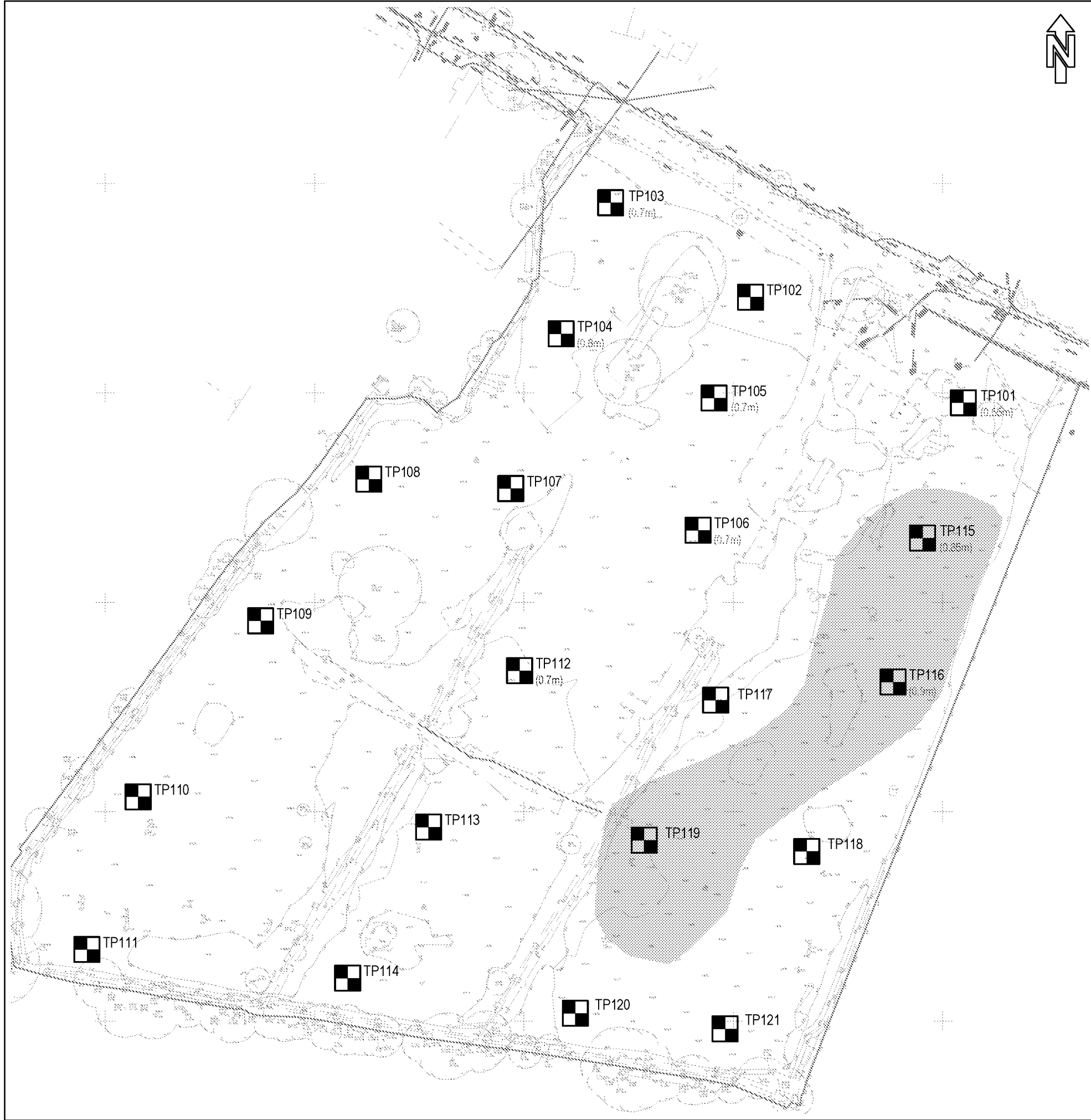
Regards,



Stephen Preston

Consultant

Enc. Sketch plan – ‘Exploratory Hole Location Plan Showing Deleterious Topsoil
Assessment Criteria – Residential with Homegrown Produce



INFORMATION WITHIN THIS DRAWING IS NOT NECESSARILY PRODUCED TO SCALE.
ALWAYS USE FIGURED DIMENSIONS AND CO-ORDINATES - IF IN DOUBT, ASK.

KEY:

- Approximate location of topsoil / made ground sampling location carried out by Eastwood & Partners on 16.12.19.
- Approximate depth of made / re-worked ground.
- Approximate depth of possible made / re-worked ground.
- Approximate maximum extent of topsoil containing deleterious material.

A	First Issue.			
REV	DESCRIPTION	SIG	CHK	DATE

REDROW HOMES LTD

ANGEL'S & HYDE NURSERIES,
YAPTON ROAD, BARNHAM

EXPLORATORY HOLE LOCATION PLAN
SHOWING DELETERIOUS TOPSOIL

Eastwood & Partners
CONSULTING ENGINEERS

St. Andrew's House
23 Kingfield Road
Sheffield
S11 9AS

Tel 0114 255 4554
Fax 0114 255 4330

mail@eastwoodandpartners.com
www.eastwoodandpartners.com

SCALE WHEN PLOTTED AT AS		DRAWING STATUS	
1:1000		INFORMATION	
SKETCH ONLY		NUMBER	REV
DRAWN	CHECKED	21.01.20	44161 / 050
RH	RAN		A

Inorganic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)
Arsenic	37
Cadmium	11
Chromium (III)	910
Chromium (VI)	6
Lead	200
Mercury	1.2
Nickel	180
Selenium	250
Copper	2400
Zinc	3700

Organic Compounds	Human Health - Residential with Homegrown Produce (mg/kg)		
	1% SOM	2.5% SOM	6% SOM
Naphthalene	2.3	5.6	13
Acenaphthene	210	510	1100
Acenaphthylene	170	420	920
Fluorene	170	400	860
Phenanthrene	95	220	440
Anthracene	2400	5400	11000
Fluoranthene	280	560	890
Pyrene	620	1200	2000
Benzo(a)anthracene	7.2	11	13
Chrysene	15	22	27
Benzo(b)fluoranthene	2.6	3.3	3.7
Benzo(k)fluoranthene	77	93	100
Benzo(a)pyrene	2.2	2.7	3.0
Dibenz(a,h)anthracene	0.24	0.28	0.3
Indeno(1,2,3-cd)pyrene	27	36	41
Benzo(g,h,i)perylene	320	340	350
Benzene	0.087	0.17	0.37
Toluene	130	290	660
Ethylbenzene	47	110	260
o-Xylene	60	140	330
m-Xylene	59	140	320
p-Xylene	56	130	310

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Prepared	RAN	Checked	CAT	Date	20/01/20	Job No	44161
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 Eastwood & Partners CONSULTING ENGINEERS St Andrew's House 23 Kingfield Road Sheffield S11 9AS	ANGEL'S & HYDE NURSERIES, BARNHAM REDROW HOMES ASSESSMENT CRITERIA – RESIDENTIAL WITH HOMEGROWN PRODUCE
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Contaminant	Phytotoxicity			
	pH 5.0 to 5.5	pH 5.5 to 6.0	pH 6.0 to 6.5	pH >7.0
Arsenic	50			
Cadmium	3			
Chromium	400			
Lead	300			
Mercury	1			
Nickel	50	60	75	110
Copper	80	100	135	200
Zinc	200	200	200	300

The assessment concentration for lead is the Category 4 Screening Level produced by Contaminated Land: Applications in Real Environments (CL:AIRE) and outlined in Appendix H of their report SP1010. The others have been taken from Nathanail, C. P., McCaffrey, C., Gillett, A., Ogden, R., and Nathanail, J., 2015, *'The LQM/CIEH S4ULs for Human Health Risk Assessment'*, Land Quality Press, Nottingham. The metals/metalloids are based on a sandy loam soil and 6% soil organic matter. The assessment values are not intended to be applied to individual sample results where materials are similar, as the levels of contaminants will have a natural variability across the site. Instead, the modified mean value should be compared with the assessment concentration.

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NOTES

LEGEND:



Plots requiring a 600mm capping layer, including anti-dig layer,
due to identified presence of asbestos in underlying soil.

REV	DESCRIPTION	SIG	CHK	DATE
A	First Issue.			

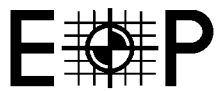
REDROW HOMES

WINDMILL VIEWS, BARNHAM

ASBESTOS AFFECTED PLOTS

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SCALE WHEN PLOTTED AT A1

1:2500 / 1:100

DRAWING STATUS

PRELIMINARY

DRAWN	CHECKED
RH	RAN

DATE
07.01.21

DRAWING NUMBER
44161 / 100

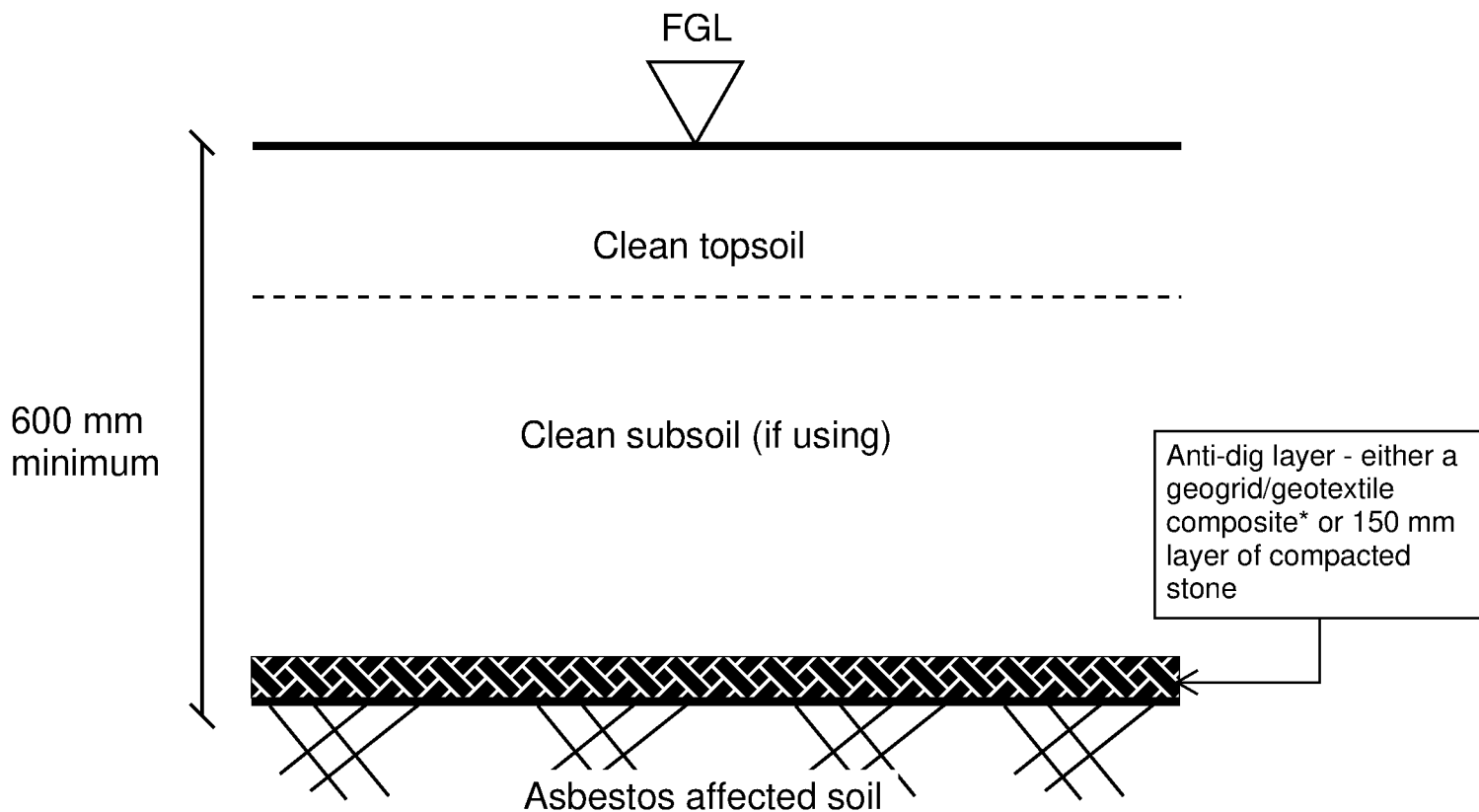
REV
A

Section Through Proposed Capping Layer over Asbestos Affected Soil

Site: Windmill Views, Barnham

Client: Redrow Homes

E&P Ref: 44161/SK02



*Geogrid/geotextile composite is a polypropylene extruded biaxial geogrid with a non-woven geotextile bonded to one side.