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PLANNING AND ACCESS STATEMENT IN SUPPORT OF APPLICATION FOR WORTHING HOMES AND W. STIRLAND.

PROPOSED TWELVE NEW FLATS AT 24 LYNDHURST ROAD, WORTHING.

March 2008

OUR REF: 08-003

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1.0 Introduction

1.1 This planning statement has been prepared by Miller-Hughes Associates on behalf of Worhting Homes and W Stirlands in support of a detailed planning application for the development of 24 Lyndhurst Road, Worthing.

1.2 This statement describes the site and surrounding area and the application proposals.

2.0 Site and Surrounding Area

2.1 The application site measures 0.068 ha and is currently vacant, having recently been cleared.

2.2. The site lies between an existing Public House; The Alexander and an existing Nursing Home. The site is now clear, ready for construction to begin and is surrounded on three sides by walls to the neighbouring properties.

3.0 Application Proposal

3.1 This application seeks planning permission for the following reserved matters:

- Siting
- Design
- External appearance
- Means of access and
- landscaping

3.2 The proposed accommodation is as follows –

Eight two bedroom flats and four one bedroom flats.

3.3 The proposed building is two storey with a mansard roof behind a parapet wall. It has been designed to be in keeping with the immediate neighbouring buildings, being smaller than the adjacent pub and considerably smaller that the existing nursing home.

3.4 The proposals have been carefully considered within their context to fit in with their surroundings and the existing buildings in the area. The proposal consists of a single building set on the site. The building will be finished in render, similar to that found on buildings in the area.

3.5 The scheme proposes six parking spaces. These are located towards the back of the site with a manoeuvring space separating them from the proposed building.

The proposal has one vehicle and one pedestrian access point.

4.0 Planning Policy

4.1 This is an application for reserved matters only, so the issues relating to Planning Policy have already been dealt with.

5.0 Assessment of Proposal

5.1 **Siting**: The building sits approximately 1300 mm from its Eastern boundary, providing pedestrian access to the rear of the site. Towards the back of the footpath is the bin store providing secure storage for 4 no. 660 litre bins. Beyond the gate from the bin store is the grassed amenity space.

5.2 **Means of Access**: The vehicle access runs along the Western side of the building to the parking court behind. The pedestrian access runs along the sites Eastern Boundary.

5.3 **Design and External Appearance**: The building will be finished in render with feature banding. The façade has a pair of double height bays and a first floor balcony which also serves as a canopy for the front entrances to flats one and two. The bays are set back from the pavement edge and separated with metal railings.

The walls finish with a parapet wall, behind which is a mansard roof with dormer windows and doors with "Juliet" style balconies to the second floor flats.

The building retains the same height, mass and scale as that submitted for the outline application, however, the footprint has increased slightly to the East to meet Housing Association space standards.

5.4 **Landscaping**: Both the footpaths and road will be finished in Tarmac. The access road has a recessed lay-by to allow vehicles to pass. The parking spaces will be finished in brick paviours.

6.0 Access

6.1 Vehicular and Transport links

The site provides pedestrian and cycle access to the local facilities.

Vehicle access for emergency services and refuse collection is provided.

All units (with the exception of the first floor flats have ample outdoor space for patios and gardens. There is ample room within the curtilage of the houses for bins, recycling and bikes.

6.2 Inclusive Access

Planning permission; no. WB/05/1286/OUT has already been granted for twelve flats on the site so this Design and Access statement does not deal with proximity of services.

6.3 Accessible Environment

The front doors of the units will have level thresholds, allowing easy access, in accordance with Part "M" of the Building Regulations Approved Documents. All the units will have an accessible bathroom.

7.0 Conclusions

7.1 The proposal makes effective use of the site.

7.2 The proposed building take account of its relationship with neighbouring buildings and properties and the character of the area by using appropriate building forms and materials.

7.3 The scheme is considered to make effective use of a site which is appropriate for development as housing.

7.4 The proposal is considered to make effective use of a vacant site in a site surrounded by similar buildings in accordance with local policy.

Supplementary Site Investigation & Risk Assessment Report
at

24 Lyndhurst Road, Worthing

Report Date: 17 December 2007

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A INTRODUCTION

1 Authority

Our authority for carrying out this work is contained in an e-mail communication of 16th October 2007 from Ben Cheal of Roffey Homes Ltd

2 Proposed Construction

It is proposed to construct a block of flats with associated parking area and a small shared amenity space.

For the purposes of the contamination risk assessment, the proposed development is classified as **Residential without plant uptake (CLEA model[1]).**

3 Object

This is a Phase II contamination (risk estimation and evaluation) investigation (Tier 1).

An earlier investigation had identified hydrocarbon contamination in the soils associated with an underground tank farm. Elevated concentrations of other contaminants were recorded in superficial Made Ground soils. The object of this supplementary investigation was to assess the nature and extent of soil and groundwater contamination on the site and to determine the need for remediation within the context of the proposed development.

4 Scope

This report presents our exploratory hole logs and test results and our interpretation of these data.

As with any site there may be differences in soil conditions between exploratory hole positions.

Geotechnical issues are not considered in this report.

This report is not an engineering design and the figures and calculations contained in the report should be used by the Engineer, taking note that variations will apply, according to variations in design loading, in techniques used, and in site conditions. Our figures therefore should not supersede the Engineer's design.

The findings and opinions conveyed via this Site Investigation Report are based on information obtained from a variety of sources as detailed within this report, and which Southern Testing Laboratories Limited believes are reliable. Nevertheless, Southern Testing Laboratories Limited cannot and does not guarantee the authenticity or reliability of the information it has obtained from others.

The site investigation was conducted and this report has been prepared for the sole internal use and reliance of Roffey Homes Ltd and their appointed Engineers. This report shall not be relied upon or transferred to any other parties without the express written authorization of Southern Testing Laboratories Limited. If an unauthorised third party comes into possession of this report they rely on it at their peril and the authors owe them no duty of care and skill.

[1] Environment Agency R&D Publication CLR 7 to 10 (2002) 'The Contaminated Land Exposure Assessment (CLEA) Model'

B DESK STUDY & WALKOVER SURVEY

5 Location

The site is situated around 1 km east of Worthing town centre. The approximate National Grid Reference of the site is TQ 156 031

6 Desk Study

A desk study was carried out carried out as part of an earlier investigation (J8853) to which the reader is referred for details. A brief summary of the relevant information is given below.

6.1 Geology

The British Geological Survey Map No TQ 10 SE indicates that the site geology consists of Brickearth over possible Raised Beach Deposits over Chalk.

6.2 Hydrology and Hydrogeology

The site is underlain by a major aquifer (The Chalk), though it is not utilised in the near vicinity and the site is not within a source protection zone. The associated soils are given the default urban classification of high leaching potential, though earlier investigations indicate that an intermediate or low leaching potential classification would be more appropriate for the site.

There are no surface water features on or near the site, the site is not within an area shown to be subject to flooding.

6.3 History

Reference to historical Ordnance Survey mapping indicates that the site was essentially undeveloped until at least 1938. A garage is first indicated on the site on the 1973 map.

6.4 Environmental Databases Search

No significant potentially contaminative land uses likely to impact on the site are indicated within 250m of the site.

6.5 Subsidence and Mining Activities

Moderate risk is indicated for collapsible ground, low to moderate risk for shrinking or swelling clay.

7 General Description

The site is rectangular in plan and fronts onto Lyndhurst Road to the north. There is a public house to the east, a residential parking area to the south and an electricity substation to the west.

At the time of this investigation, the buildings had been demolished to slab level (with the exception of the boundary walls) and the site cleared, though a large excavator belonging to the demolition contractor remained on site. The tank farm at the front of the site had been excavated by others, and the tanks removed.

The site stands within the low lying, gently inclined coastal plain. The sea is around 500m to the south.

C PRELIMINARY CONCEPTUAL MODEL

8 Introduction

In the context of this report, the conceptual model summarises the potential pollutant linkages identified for the site and forms the basis of the risk assessment for the site. The preliminary model comprises the potential sources of contamination, receptors that could be harmed and exposure pathways identified from earlier phases of investigation. These potential linkages form the basis upon which the investigation is designed and reported.

9 Potential Sources of Contamination

The site has a history of use as a motor repair garage and fuel station, and is located within a predominantly residential area.

A number of potentially contaminative uses have been identified in the surrounding area, though none are considered likely to affect the site..

Potential contaminants associated with the site have been compiled from earlier phases of investigation.

9.1 On Site Sources

Source	Potential Contaminants
Underground tank farm	Petroleum hydrocarbons
Above ground fuel oil tank and oil burner	Petroleum hydrocarbons
Made Ground	Lead, BaP

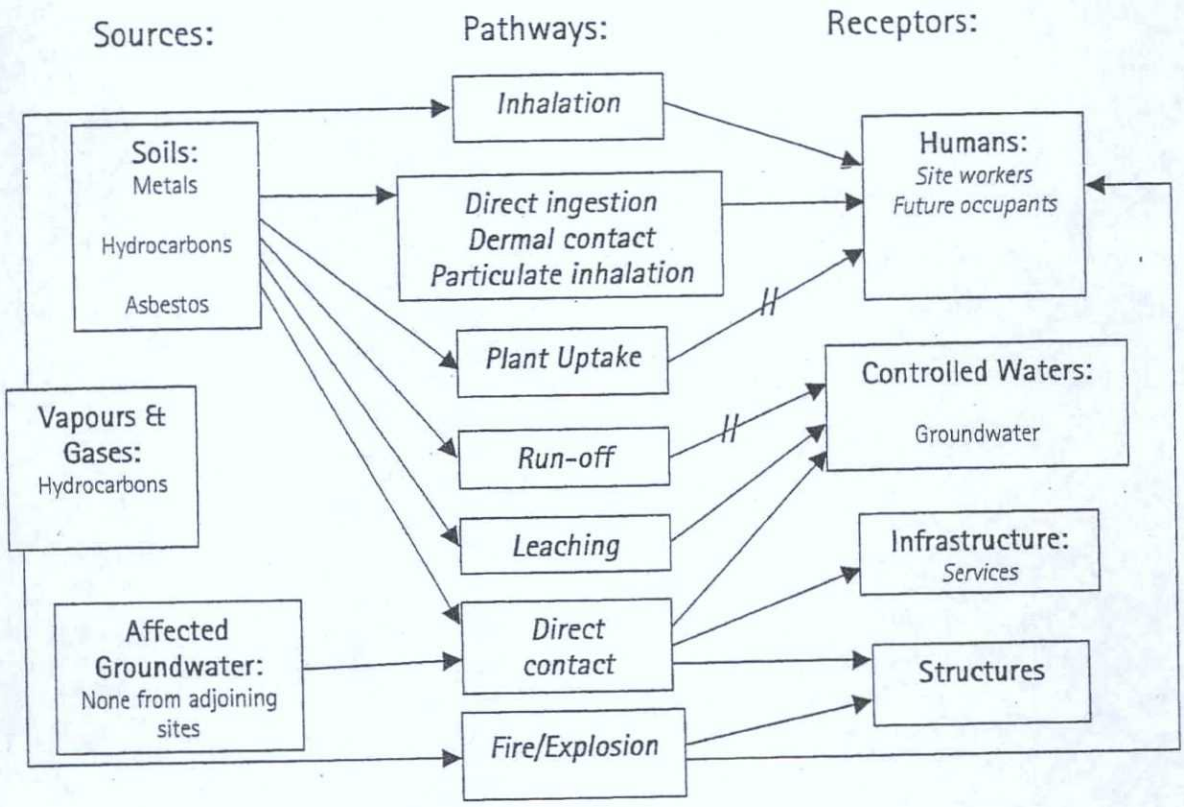
Petroleum hydrocarbons consistent with petrol contamination were identified in the soils around the underground tank farm during the earlier investigation. Diesel type contamination was identified in soils at depth at the rear of the site, though no source was positively identified. Some hydrocarbon contamination may be associated with an oil burner and the associated above ground fuel tank, though no exploratory holes could be excavated in the most sensitive areas at the time of the earlier investigation. Possible metal and PAH contamination of the superficial made ground soils was also identified, more likely associated with a buried topsoil material rather than the widespread crushed brick and concrete hardcore/sub-base. Asbestos containing materials could be present in the made ground, though none were identified in the earlier investigation.

9.2 Off Site Sources

No significant off-site sources have been identified.

10 Pollutant Linkages and Model Summary

The following diagram shows the potential pollutant linkages identified for the site and summarises the preliminary conceptual model:



Pollutant linkages involving plant uptake pathways are not complete for this site as the development proposals include no private gardens and only limited soft landscaping. Run-off pathways are excluded as there are no surface waters close to the site.

D SITE INVESTIGATION

11 Method

The strategy adopted for the intrusive investigation comprised the following:

- 1 No 12 m deep borehole was drilled using a light percussion, shell and auger boring rig. Drilling was progressed at 200mm diameter to the top of the Chalk, where an aquifer seal was placed and drilling continued through the seal at 150mm diameter.
- A series of 9 test pits were excavated using a hydraulic backhoe excavator.

The exploratory hole locations are shown in Figure 1, Appendix A.

12 Weather Conditions

The fieldwork was carried out between 2nd and 9th November 2007 at which time the weather was generally dry.

13 Soils as Found

The soils encountered are described in detail in the attached trial hole logs (Appendix A), but in general comprised a shallow covering of Made Ground over Brickearth over clay, with the Chalk at depth. A condensed summary is given below:

Depth	Thickness	Soil Type	Description
GL to 0.2/0.75m	0.3m to 0.75m	Hardstanding and Made Ground	Concrete or Blacktop over brick and concrete rubble with some sand matrix.
0.2/0.7m to 0.6/0.9m Absent from some holes.	0.2m to 0.35m	Buried Topsoil	Dark brown sandy clay topsoil with fine gravel of brick, flint, charcoal and some clinker and chalk.
to 2.7/3.8m	2.0m to 3.0m	Brickearth	Firm orange brown and brown CLAY with occasional fine and medium flint gravel.
to 5.8m (in BH)	Up to 2.8m (in BH)	Clay	Firm multicoloured CLAY with variable admixtures of sand and gravel.
To > 12m	> 6m	Chalk	Grey and off-white structureless CHALK. Possibly intact Chalk below 10m.

13.1 Visual and Olfactory Evidence of Contamination

Evidence of possible contamination in the form of hydrocarbons was recorded at the location of TP's 3, 6A, 6B and 7, and in BH 1.

These occurrences are discussed in Section F.

14 Groundwater Strikes

Water was struck in the borehole only. The initial strike was at 9.8m bgl and the water level rose to 9.0m in 20 minutes.

E FIELD TESTING AND SAMPLING

The following in-situ test and sampling methods were employed.

15 Hand Penetrometer Test

The hand penetrometer consists of a spring loaded and calibrated plunger which is forced into the soil. A reading of unconfined compression strength (equal to twice cohesion) is given on a calibrated scale. In common with other hand methods of strength assessment (eg. the shear vane) it does not give an accurate indication of bearing capacity in stiff or fissured soils, because of the small test area. The figures are used for strength classification according to the table below.

Hand Penetrometer Value (kPa)	Undrained Shear Strength cu (kPa)	Undrained Shear Strength of Clays
Less than 20	Less than 10	Extremely Low
20 to 40	10 to 20	Very Low
40 to 80	20 to 40	Low
80 to 150	40 to 75	Medium
150 to 300	75 to 150	High
300 to 600	150 to 300	Very High
More than 600	More than 300	Extremely High

16 Disturbed Samples

Disturbed samples were taken from the trial holes and stored in sealed glass jars or polythene pots or bags, as appropriate.

F LAND QUALITY

17 Analytical Framework

There is no single methodology that covers all the various aspects of the assessment of potentially contaminated land and groundwater. Therefore, the analytical framework adopted for this investigation is made up of a number of procedures, which are outlined below. All of these are based on a Risk Assessment methodology centred on the identification and analysis of Source – Pathway – Receptor linkages.

The CLEA model[2] provides a methodology for quantitative assessment of the long term risks posed to human health by exposure to contaminated soils. Toxicological data is used to calculate a Soil Guideline Value (SGV) for an individual contaminant, based on the proposed site use. Soil Guideline Values have been published for a limited number of contaminants, related to four specific end uses (residential with and without plant uptake, allotments and commercial/industrial) and these may be used as screening values.

CLEA requires a statistical treatment of the test results to take into account the normal variations in concentration of potential contaminants in the soil and allow comparisons to be made with published guidance.

In the absence of any published SGVs for certain parameters, Southern Testing have derived Tier 1 screening values for initial assessment of the soil, based on available current guidance and our own experience. No specific reference is made to any non-UK guidance, and site-specific assessments are undertaken wherever possible and/or applicable. All assessments are carried out in accordance with the CLEA protocol.

The results of the groundwater analyses are compared to relevant UK standards.

18 Site Investigation – Soil

18.1 Sampling Regime

The exploratory holes were excavated in locations of known and suspected contamination, and in areas of proposed soft landscaping.

18.2 Testing

The potential for contamination by petroleum hydrocarbons, lead and BaP was identified in the preliminary conceptual model and, therefore, the following tests were selected.

Test Suite	Number of Samples
STL Key	6
TPH	16
Speciated TPH	2

The test results are presented in full in Appendix B. A summary and discussion of the significance of the results and identified contamination sources is given below.

[2] Environment Agency R&D Publication CLR 7 to 10 (2002) 'The Contaminated Land Exposure Assessment (CLEA) Model'

18.3 Test Results and Identified contamination sources

18.3.1 General Contaminants

The results of the key contaminant tests have been analysed in accordance with the CLEA methodology. The samples have been grouped into two populations comprising Buried Topsoil and Brickearth. For each parameter in each population the upper 95th percentile value (U_{95}) has been compared to a Tier 1 screening value. Where any parameter exceeds the screening value then the maximum value test is applied to determine whether or not this represents an outlier, ie a hotspot of contamination or whether it is simply at the upper end of a normal population distribution. The statistical analysis is presented in Appendix B. The source of the screening values is given in the footnotes. The test results are summarised as follows.

Soil Group : **Buried Topsoil**				
Samples Tested : TP2 @0.8, TP5 @0.45, TP8 @0.5, WS2 @0.2, WS5 @0.5				
Contaminant	**Unit**	**Measured Range**	**Upper 95th Percentile Bound Value**	**Screening Value**
Arsenic (As)	mg/kg	15 - 24	**22**	20
Cadmium (Cd)	mg/kg	<0.5 - 0.9	0.88	30
Total Chromium (Cr)	mg/kg	15 - 22	21	/
Hexavalent Chromium (CrVI)	mg/kg			200
Lead (Pb)	mg/kg	190 - 390	382	450
Mercury (Hg)	mg/kg	<0.6 - 0.8	0.79	15
Selenium (Se)	mg/kg	<1	2.7	260
Nickel (Ni)	mg/kg	13 - 21	20	75
Copper (Cu)	mg/kg	29 - 90	88	250
Zinc (Zn)	mg/kg	130 - 320	282	1000
Total (mono) Phenols	mg/kg	<0.1	0.93	21900
Benzo[a]pyrene	mg/kg	<0.1 - 2.5	**1.9**	1.5
Total of 10 PAHs (Dutch)	mg/kg	0.14 - 22.41	16	40
Total of 16 PAHs (USEPA)	mg/kg	2.81 - 30.93	28	/
Total Cyanide (CN)	mg/kg	<1	4.7	/
Acidity	mg/kg	7.2 - 7.8		8.2

This data set includes the test results from the earlier investigation.

The analysis indicates marginal exceedances of the screening values for arsenic and BaP only.

The analysis of the test results for the underlying Brickearth, tabulated below, indicates an exceedance of the screening value for Lead. This is based on one sample (TP2 at 1m), for which a lead concentration of 960 mg/kg was recorded; the other two samples returned values of only 29 and 43 mg/kg. Only three samples were analysed and so the maximum value (outlier) test could not be applied. However, Brickearth does not normally contain elevated levels of lead and the samples tested show very low levels of other contaminants. The sample would almost certainly be identified as an outlier in a larger population of samples. The origin of the elevated lead concentration is not known.

It is important to note that the Brickearth at TP2 is present from a depth of 0.9m bgl and is currently covered by a layer of buried topsoil and 0.5m of brick and concrete rubble, beneath the concrete oversite.

Soil Group : Brickearth				
Samples Tested : TP1 @0.85, TP2 @1, TP5 @0.75				
Contaminant	**Unit**	**Measured Range**	**Upper 95th Percentile Bound Value**	**Screening Value**
Arsenic (As)	mg/kg	7.4 - 9.1	9.6	20
Cadmium (Cd)	mg/kg	<0.5	0.50	30
Total Chromium (Cr)	mg/kg	20 - 24	25	/
Hexavalent Chromium (CrVI)	mg/kg			200
Lead (Pb)	mg/kg	29 - **960**	**2689**	450
Mercury (Hg)	mg/kg	<0.6	0.60	15
Selenium (Se)	mg/kg	<2.5	2.5	260
Nickel (Ni)	mg/kg	11 - 18	21	75
Copper (Cu)	mg/kg	13 - 17	19	250
Zinc (Zn)	mg/kg	54 - 57	58	1000
Total (mono) Phenols	mg/kg	<0.1	0.10	21900
Benzo[a]pyrene	mg/kg	<0.1	0.10	0.3
Total of 10 PAHs (Dutch)	mg/kg	<1 - 1	1.4	40
Total of 16 PAHs (USEPA)	mg/kg			/
Total Cyanide (CN)	mg/kg	<1	1.0	/
Acidity	mg/kg	6.9 - 7.6		10

18.3.2 Organic Contaminants

Testing for hydrocarbons was targeted in areas of known or suspected contamination and the results are considered accordingly.

'Diesel' contamination

Hydrocarbons in the diesel range were recorded at depth in the centre rear of the site during the earlier investigation. Additional tests were carried out in the course of this investigation on samples taken at depth from locations (TP1 and TP3) adjoining the original exploratory hole. The results are in the range 5 to 12 mg/kg EPH, a carbon range of C16 to C40 is given for one sample. Therefore, the contamination recorded in the earlier investigation appears to be localised.

Above ground tank and oil burner

TP 3 was excavated at the location of the former oil burner, where staining and a sheen of hydrocarbon was present on the surface concrete slab, whilst TP4 was excavated at the location of the former above ground tank. Hydrocarbon contamination was recorded at both locations and the results are tabulated below.

	TP3 0.35m Made ground	TP3 0.80m Brickearth	TP4 0.25m Made ground	TP4 0.5m Buried topsoil
EPH C10 – C12	49	<5	<5	-
EPH C12 – C16	1000	<5	<5	-
EPH C16 – C21	2900	<5	9	-
EPH C21 - C36	1700	5	140	-
EPH C36 – C40	44	<5	40	-
EPH	5700	12	190	-
EPH Aliphatics[3] C10 – C40	-	-	-	13

All concentrations in mg/kg

Elevated concentrations of C12 to C36 hydrocarbons are present in the brick and concrete made ground, where brown staining was observed. The staining is of limited extent and the contamination was not found in the underlying Brickearth. The hydrocarbons are characterised as being consistent with a degraded diesel and this raises the possibility that it may be in some way connected with that found during the earlier investigation. However, no evidence was found at depth in TP3, see above, and there is no obvious connecting pathway. The diesel contamination may be associated with a gully drain next to the original exploratory hole.

Below ground tank farm

Trial pits 6A and 7 were excavated next to the tank sarcophagus, and TP 6B was excavated inside the sarcophagus. The test results are tabulated below.

The sample taken from within the sarcophagus (TP6B) was of sand, a remnant of the original tank surround, and is the only sample to show an elevated concentration of hydrocarbons; predominantly in the C21-C36 range.

Trial pits 6A and 7 were excavated at locations close to those of WS3 and WS5 respectively of the earlier investigation. WS3 returned a maximum EPH concentration of 110 mg/kg at 4.0m, whilst 400 mg/kg was recorded at 3.0m in WS5. The test results from this investigation do not replicate those earlier results, which suggests that the distribution of elevated concentrations of hydrocarbon around the tank farm is patchy. The speciated results, for TP6A at 3.4m, are split 60:40 aromatic compounds to aliphatic compounds. The aromatics are predominantly in the range C12–C35, whilst the aliphatics are mostly C16–C35, with some C6–C8. There are minor components in other carbon bands.

In all cases, the upper 2.5m of the soil profile is also visibly clean. The base of the tank farm is at around 2m bgl. Some discolouration of the soils was recorded locally in part of TP7, from around 1.5m bgl. This suggests that there was a surface source of spillage, perhaps from a pump or associated pipework close to TP7, that propagated vertically downwards and has spread out,

[3] Samples of soils with high natural organic content are subject to silica gel treatment during testing and EPH results represent aliphatic fraction only.

probably across the more plastic (and less permeable) clay at around 3.5 to 4m bgl, where the strongest odours were noted. The trend of increasing concentration and odour with depth is consistent with the hydrocarbon being drawn up into the Brickearth from the lower clay by capillary action. Some additional contribution from the base of the tank farm cannot be ruled out.

	EPH C10- C12	EPH C12-C16	EPH C16-C21	EPH C21-C36	EPH C36-C40	EPH	EPH Aliphatics[3] C10 - C40
TP6A 0.6m	-	-	-	-	-	-	10
TP6A 1.1m	<5	<5	<5	<5	<5	8	-
TP6A 2.4m	<5	<5	<5	<5	<5	9	-
TP6A 3.4m						35[4]	
TP6A 3.9m	<5	<5	<5	<5	<5	9	-
TP6A 4.4m	<5	<5	<5	<5	<5	9	-
TP6B 1.6m	<5	6	43	370	94	510	-
TP7 1.5m	<5	<5	<5	<5	<5	11	-
TP7 3.0m						5[4]	

Miscellaneous

A number of other samples taken from around the site were tested for hydrocarbons, including the shallow soils beneath the former lock-up garages slab and at the location of a possible former interceptor/drain, TP's 1, 2 and 8. These samples returned EPH concentrations in the range 6 to 15 mg/kg.

19 Site Investigation – Waters

19.1 Sampling Regime

Groundwater samples were taken from the boreholes 5 days after the installation of the monitoring wells. The following parameters were also recorded during purging/sampling.

- Dissolved Oxygen
- Electrical Conductivity
- pH and Temperature
- ORP (oxidation/reduction potential)

The water level and monitoring test results are tabulated below;

[4] TPH from fully speciated test results.

BH1					14/11/2007
Water Level mbgl	pH units	Temperature °C	Dissolved Oxygen ppm	Electrical Conductivity µs/cm	ORP mV
5.84	7.1	13.1	0.9	882	-194

The monitoring shows the groundwater level at the top of the Chalk. The physico-chemical parameters indicate low oxygen levels and possible mildly reducing conditions. This may be due to localised oxygen consumption in the immediate vicinity of the borehole.

19.2 Testing

The potential for contamination by hydrocarbons was identified in the preliminary conceptual model and, therefore, the following tests were selected.

- Speciated TPH
- EA Leachate suite

The test results are presented in full in Appendix B. A summary and discussion of the significance of the results and identified contamination sources is given below.

19.3 Test Results and Identified Contamination

The general groundwater quality is fairly good, with the recorded concentrations below saltwater EQS. The saltwater EQS is used as the sea is the most likely receiving water for groundwater beneath the site. Only phenol was recorded at a concentration above EQS, with 69 ppb recorded compared with 30 ppb for the EQS.

No EQS for selenium has been identified and the recorded concentration of 14 ppb marginally exceeds the Drinking Water Standard of 10 ppb.

The hydrocarbon testing revealed low concentrations of a range of hydrocarbons, most of which fall in the low carbon ranges, C5-C12. This is not representative of the contamination found in the soils but more likely reflects the relative solubility of the compounds. Some BTEX compounds were also recorded, with concentrations of Benzene and Toluene exactly matching the low carbon aromatic hydrocarbons, which these compounds represent. The total hydrocarbons concentration recorded is 33.98 mg/l, with peak fraction concentrations as follows;

Aliphatic C5-C6 4.4 mg/l

Aromatic C6-C7 15 mg/l (Benzene 15 mg/l)

Aromatic C7-C8 3.7 mg/l (Toluene 3.7 mg/l)

Aromatic C8-C10 5.5 mg/l

A small concentration of MTBE was also recorded (1.2 mg/l) which, taken with the presence of BTEX compounds, confirms a fuel source for the contamination.

20 Summary of Identified Contamination

Arsenic and BaP have been found in a layer of buried topsoil at concentrations marginally above their respective Tier 1 screening values, and a single elevated concentration of lead was recorded

in the underlying Brickearth. Hydrocarbon contamination has been found in superficial made ground beneath a former oil burner and, to a lesser degree, beneath the associated above ground storage tank. Hydrocarbon contamination has also been found in and at depth around the former underground tank farm, and also in the groundwater beneath the site at that location. The significance of this contamination in the context of the proposed development is discussed below.

No asbestos has been identified in soil samples tested in the course of this or our earlier investigation. However, as with any site where demolition waste is present (ie the brick and concrete made ground), it is possible that asbestos containing materials could be present, even though none have been recorded to date.

21 Risk Evaluation

The object of the risk evaluation is to assess the pollution linkages for specific contaminant groups considered in the conceptual model, identify any unacceptable risks and, therefore establish whether there is a need for further investigation and/or remedial action.

The risks are considered in the context of the specific development proposals for the site and, therefore, the conclusions may not be appropriate for alternative schemes.

21.1 Arsenic, Lead and BaP

Arsenic and BaP were found in the layer of buried topsoil at levels only marginally exceeding their Tier 1 screening levels. The screening levels are based on a generic risk scenario, set out in CLR 10, that includes for significant direct exposure to soils outdoors. Given the limited extent of soft landscaping and amenity space in the development, this scenario is conservative and the actual exposure is likely to be significantly less. The affected soil is also present at depths of 300mm or more below current surface levels and is everywhere covered by a layer of brick and concrete made ground. The proposed final finished levels are not known but it is likely that the made ground will be removed, as it is not a suitable growing medium, and replaced with a more viable soil. Therefore, the potential for exposure to the affected soils will be further reduced and it is considered that these contaminants do not pose a significant risk to the development.

Similarly, the lead contamination recorded in the Brickearth, whilst found beneath the proposed amenity space, was only found at a depth in excess of 900mm bgl and is covered by a layer of buried topsoil beneath 500mm of brick and concrete made ground. These soils will not, therefore be exposed at the surface and will likely be covered by at least 700mm of other material. Accordingly, this material is not considered to pose a significant risk.

21.2 Petroleum hydrocarbons

Site specific assessment criteria for the various dominant hydrocarbon fractions identified on the site have been derived using the CLEA UK model, incorporating the parameter values given in CIEH/LQM 2007[5]. A clay soil type with an organic carbon content of 0.5% has been used, and the building size, source area and proportion of site hardcover have been modified to model the site conditions and proposed development. The results are included in full in Appendix C and the Assessment Criteria tabulated below. In each case the lower value of direct and inhalation exposure pathways is given.

The concentrations of hydrocarbons recorded on the site generally fall well below the Assessment Criteria values. The C16 to C36 fraction of the sample from TP3 at 0.35m (in the made ground beneath the former oil burner) would fail this test if all the hydrocarbon were aromatic compounds. This is unlikely and, in any case, this area of the site will be beneath the proposed

[5] Generic Assessment Criteria for Human Health Risk Assessment

access road and isolated from the development.

Carbon Range	Compound Type	Assessment Criteria value mg/kg
>C6 – C8	Aliphatic	263,000
>C8 – C10	Aliphatic	5270
	Aromatic	2110
>C10 – C12	Aliphatic	5270
	Aromatic	2110
>C12 – C16	Aliphatic	5270
	Aromatic	2110
>C16 – C35	Aliphatic	105,000
>C16 – C21	Aromatic	1580
>C21 – C35	Aromatic	1580
>C35 – C44	Aliphatic	153,000
	Aromatic	2290

21.3 Groundwater

The hydrocarbon contamination is dominated by BTEX compounds, particularly Benzene which alone accounts for around half of the total. The concentration of Benzene is relatively high in comparison with the EQS, but the groundwater is not grossly contaminated.

The site has a number of characteristics that mitigate potential impact, particularly any future impact, by the groundwater pathway.

- The groundwater will not affect the proposed development as the recorded water level is at around 6m bgl and the water strike data from the drilling indicates that the groundwater may be at least partly confined by the structureless chalk.
- The primary source of contamination has been removed and the source area falls within the footprint of the proposed building. Therefore, there will be no infiltration recharge through that part of the unsaturated zone containing residual contamination and, accordingly, the source concentration at depth will diminish with time.
- The site is located within the coastal plain where groundwater velocities would be expected to be low. Whilst this does reduce dilution effects, the slow migration rate allows more time for natural attenuation.

- The site is not in a hydrogeologically sensitive location; the groundwater is not utilised, and is not likely to be due to the risk of saline intrusion, and there are no nearby surface water features.

21.4 Revised Conceptual Model

The preliminary conceptual model has been revised in light of the findings of this investigation and is summarised below.

SUBSTANCES			PATHWAYS	RECEPTORS
Metals	*Petroleum Hydrocarbons*	*Asbestos*		
P	N	N	Ingestion and inhalation of contaminated soil and dust	Human Health
N	N	N	Inhalation of vapours	
N	N	N	Uptake into edible fruit and vegetables	
N	N	N	Surface water run-off into surface water features	Water Environment
N	N	N	Migration through ground into surface water or groundwater	
N	N	N	Off-site migration of contaminated groundwater	
N	N	N	Vegetation on site growing in contaminated soil	Flora and Fauna
N	N	N	Aquatic life in affected waters	
N	P	N	Contact with contaminated soil	Building materials/ buried services
N	N	N	Fire or explosion	

Key:

Y Pollutant linkage likely
N Pollutant linkage not likely
P Pollutant linkage possible

No likely pollutant linkages are identified. Possible linkages are identified for metals contamination in the soil, depending on whether the affected soils are brought close to the surface in the course of development (though the risk of this is considered to be low), and also for contact between buried services and hydrocarbon contaminated soil, depending on the location and depth of the services corridor.

22 Recommendations

No specific remediation is considered necessary for the proposed development. However, this is dependent on the conditions upon which the risk assessment has been made being met in the course of the redevelopment. Specifically, that the development layout is as shown on the site plan contained in this report and that those soils that are affected by contamination are not brought to the surface of the site but remain covered by existing or replacement clean soils.

Hydrocarbon contamination present in the soils could affect plastic underground service pipes (such as the types used by water and gas supply companies). Advice should be sought from the relevant companies regarding plant and materials.

If a piled foundation is to be adopted, due to the presence of disturbed ground following removal of underground structures or for reasons of load bearing, a foundation works risk assessment may be required.

As with any site, a watching brief should be maintained throughout the demolition and groundworks phase and any suspect materials or areas of soil investigated.

G CONSIDERATIONS FOR IMPLEMENTATION AND VALIDATION OF REMEDIATION

23 General Guidance

Allowance should be made for experienced validation of the site works, to ensure that the conditions outlined above are met in the course of redevelopment.

In general terms, the workforce and general public should be protected from contact with contaminated material. There is a range of relevant documents published by the Health and Safety Executive, and organisations such as CIRIA, and the BRE.

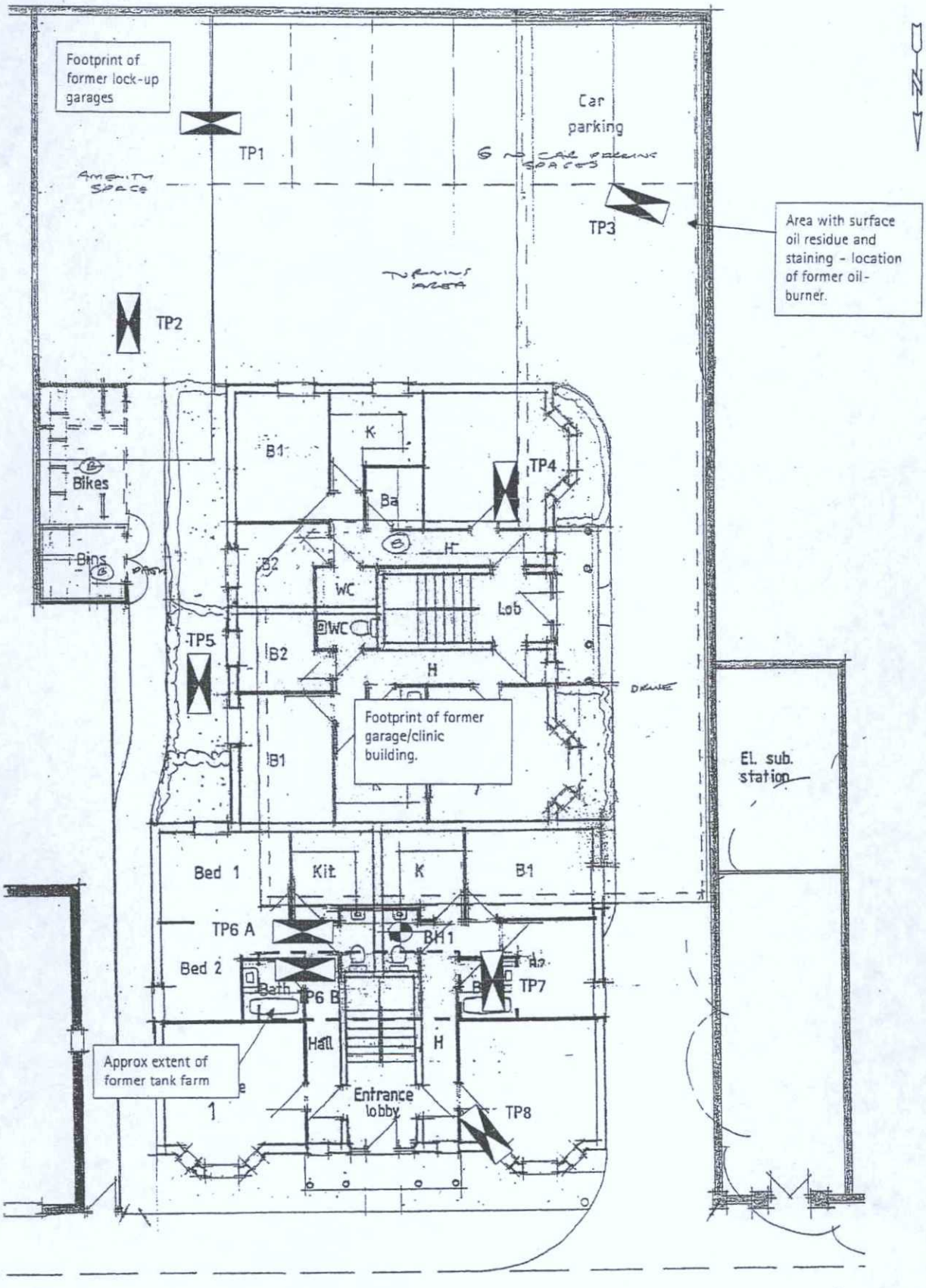
Different guidelines and charges will apply to different waste classifications. Producers of waste have a duty of care to ensure that their waste is appropriately classified and disposed of at a facility licensed to receive the waste as classified.

Accurate records of all waste classification and transfer must be kept and maintained for potential future regulatory inspection.

Many water supply companies now require higher specification pipe on contaminated sites, even following remediation.

APPENDIX A

Site Plan and Exploratory Hole Logs



NB: Positions of Boreholes and/or Trial Pits are only indicative unless dimensioned

Site:	24 Lyndhurst Road, Worthing	STL: J9415	Fig No: 1
Date:	14 December 2007	Proposed site layout with exploratory hole positions and former buildings footprints	

Southern Testing
Southern Testing, Keeble House, Stuart Way, East Grinstead, West Sussex RH19 4QA
ST Consult: Twigden Barns, Brixworth Road, Creaton, Northampton NN6 8NN
ST Consult

Southern Testing
Environmental & Geotechnical

Job No: **J9415** Hole No: **BH 1**

National Grid Reference		TQ156 031	
Start date	08/11/2007	End date	09/11/2007
Ground level		Backfill date	09/11/2007
Logged by	LDM	Engineer	LDM
Final depth	12.00	Page	1 of 1

Site : 24 Lyndhurst Road, Worthing

Client : Roffey Homes

Drilling Method : Shell and Auger (150mm)

Monitoring well	Testing: Depth	Testing: SPT/SPT(c) (N value)	Testing: U(blows)	Samples: Depth	Samples: Type	Strata: Thickness	Strata: Level	Strata: Legend	Strata: Depth	Strata Descriptions	
				0.15	D	0.50				MADE GROUND	MADE GROUND comprising crushed concrete with brick fragments
				0.30	D				0.50		
				0.50	D					CLAY	(Firm) brown CLAY with dark orange brown veining at the top. Occasional fine and medium flint gravel.
				1.00	D						
				1.50	D						
						2.50					
				2.00	D						
				2.50	D						Hydrocarbon odour and grey staining evident from 2.5m.
				3.00	D				3.00	CLAY	(Firm to stiff) orange brown , brown and grey patched sandy CLAY with ocasional fine and medium flint gravel.
				3.50	D						
				4.00	D	2.00					Hydrocarbon odour diminishing
				4.50	D						
				5.00	D				5.00	CLAY	(Firm to stiff) pale grey and yellow brown gravelly CLAY. Gravel comprises fine and medium subrounded chalk and flint.
				5.50	D	0.80					
									5.80	CHALK	No hydrocarbon odour
				6.00	D						Structureless CHALK comprising brownish grey and off white sand and silt size matrix with c50% fine to coarse sub rounded to sub angular chalk gravel. CIRIA Grade Dm. Becomes very wet below 9.5m.
				6.50	D						
				7.00	D						
				7.50	D						
				8.00	D						
				8.50	D						
				9.00	D	6.20					
				9.50	D						Small blue grey patches present at 9.5m, with a hydrocarbon odour.
				10.00	D						
				10.50	D						Below 10m, samples recovered as fine to coarse angular chalk gravel in an off-white slurry.
				11.00	D						
				11.50	D						
				12.00	D				12.00		End of Borehole

Hole Diameters: Depth (m)	Hole (mm)	Casing (mm)	Water Strikes: Date	Water (m)	Casing (m)	Time (mins)	Rose to (m)	Sealed (m)	Chiselling Time: From (m)	To (m)	Time (hrs)
12.00	200/150	200/150	09/11/07	9.80		20	9.00				

General Remarks

Borehole drilled at 200mm to 6m.

Aquifer seal installed

Borehole completed at 150mm

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TEST HOLE LOG

National Grid Reference		TQ 156 031	
Job No	J9415	Date	02/11/2007
Logged by	LDM	Engineer	LDM

Site : 24 Lyndhurst Road, Worthing

Client : Roffey Homes

Excavation Method : CAT backhoe

Hole No TP 1

Water strikes: Dry
Water level:
Pit sides: Overbreak in Made Ground

Depth m/mm	Sample Type	Test Type & Value
500	D	
850	D	⊥ 100
1.0		
2.8	D	⊥ 200
4.1	D	

Depth (Thickness)	Key	Soil Description
200 (550)	CONCRETE / MADE GROUND	Concrete slab with light 8mm bar reinforcement OR 75mm of Blacktop and bituminous gravel.
750 (2.0)	CLAY	MADE GROUND comprising brick and concrete rubble up to small boulder size with some sand and gravel matrix. Occasional slate and metal.
2.7 (1.5)	CLAY	Firm (medium strength) brown CLAY. Becomes greyish brown with depth. (BRICKEARTH)
4.2		Stiff (high strength) orange brown with dark brown and grey mottling slightly sandy and gravelly CLAY. Thin sand laminae below 3m. Sandy and moist from 4m. Patch of chalky gravel in base of pit.

Pit straddles concrete slab and blacktop

Hole No TP 2

Water strikes: Dry
Water level:
Pit sides: Overbreak in Made Ground

Depth m/mm	Sample Type	Test Type & Value
500	D	
800	D	
1.0	D	⊥ 125

Depth (Thickness)	Key	Soil Description
200 (500)	CONCRETE / MADE GROUND	Concrete slab with light 8mm bar reinforcement. MADE GROUND comprising brick and concrete rubble up to small boulder size with some sand and gravel matrix. Occasional slate.
700 (200)	TOPSOIL	Dark brown slightly sandy clay BURIED TOPSOIL with occasional fine gravel of flint, brick and charcoal.
900 (300)	CLAY	Firm (medium strength) brown CLAY. Becomes greyish brown with depth. (BRICKEARTH)
1.2		

Hole No TP 3

Water strikes: Dry
Water level:
Pit sides: Overbreak in Made Ground

Depth m/mm	Sample Type	Test Type & Value
350	D	
800	D	
1.0		⊥ 350
1.3	D	
2.0	D	
3.0	D	
3.5	D	

Depth (Thickness)	Key	Soil Description
200 (550)	CONCRETE / MADE GROUND	Concrete slab with light 8mm bar reinforcement. MADE GROUND comprising brick and concrete rubble up to small boulder size with some sand and gravel matrix. Occasional slate.
750 (2.4)	CLAY	A little oil staining at the western end of the pit. Slight hydrocarbon odour. Very stiff (very high strength) brown CLAYwith occasional flint and chalk gravel. (BRICKEARTH) Becomes orange brown and sandy from 2.5m.
3.1 (400)	CLAY	(Stiff) grey and orange brown patched slightly sandy and gravelly CLAY.
3.5		

Oily sheen and staining on slab surface.

Hole No TP 4

Water strikes: Dry
Water level:
Pit sides: Overbreak in Made Ground

Depth m/mm	Sample Type	Test Type & Value
250	D	
500	D	
1.0	D	⊥ 100

Depth (Thickness)	Key	Soil Description
175 (225)	CONCRETE	Concrete slab.
400 (200)	MADE GROUND	MADE GROUND comprising concrete and brick rubble with a little sand and gravel matrix.
600 (400)	TOPSOIL	Dark brown slightly sandy clay BURIED TOPSOIL with occasional fine gravel of flint, chalk and charcoal.
1.0	CLAY	Firm (medium strength) brown CLAY. (BRICKEARTH)

V: Perth Penetration Test, 'N' value; ▼: Standard Penetration Test, 'N' values; ⊥: Unconfined Compression Strength by hand penetrometer, kN/m2;
V: Shear Vane test, kN/m2; X: CBR by Mexe cone penetrometer, %; D: Disturbed sample; U: Undisturbed sample; B: Bulk sample; W: Water sample

Southern Testing
Environmental & Geotechnical

TEST HOLE LOG

National Grid Reference	TQ 156 031		
Job No	J9415	Date	02/11/2007
Logged by	LDM	Engineer	LDM

Site : 24 Lyndhurst Road, Worthing

Client : Roffey Homes

Excavation Method : CAT backhoe

Hole No TP 5

Water strikes: Dry
Water level:
Pit sides: Stable

Depth m/mm	Sample Type	Test Type & Value	Depth (Thickness)	Key	Soil Description
			100	BLACKTOP	Blacktop (30mm thick) over loosely bound bituminous gravel (70mm thick).
			300	MADE GROUND	
450	D		600		MADE GROUND comprising crushed brick and concrete.
750	D		(400)	TOPSOIL	
1.0		⊥ 100	1.0	CLAY	Dark brown slightly sandy clay BURIED TOPSOIL with occasional fine gravel of flint, brick and charcoal.
					Firm (medium strength) brown CLAY. (BRICKEARTH)

Hole No TP 6A

Water strikes: Dry
Water level:
Pit sides: Overbreak in Made Ground

Depth m/mm	Sample Type	Test Type & Value	Depth (Thickness)	Key	Soil Description
			(500)	MADE GROUND	MADE GROUND comprising crushed concrete, brick and blacktop fragments, occasional metals. (RECENT DEMOLITION)
600	D		500		
1.1	D		(350)	TOPSOIL	
			850	CLAY	Dark brown slightly sandy clay BURIED TOPSOIL with occasional fine gravel of flint, clinker and charcoal.
2.4	D		(3.0)		(Firm) brown with dark orange brown veining CLAY with occasional fine and medium flint gravel. (BRICKEARTH).
3.4	D				Becomes greenish grey stained and with a hydrocarbon odour from 2.35m. Odour becomes stronger and more petrol like by 3.4m
3.9	D		3.8	CLAY	(Stiff) orange brown, grey and buff slightly gravelly CLAY.
4.4	D		(500)		
			4.3	CLAY	Hydrocarbon odour diminishes with depth.
			4.5		(Stiff) pale grey slightly sandy CLAY.
					Only faint hydrocarbon odour.

Hole No TP 6B

Water strikes: Dry
Water level:
Pit sides: Unstable

Depth m/mm	Sample Type	Test Type & Value	Depth (Thickness)	Key	Soil Description
				MADE GROUND	MADE GROUND comprising crushed concrete, whole and broken bricks, blacktop fragments and occasional plastics and metals with some pale brown sandy matrix. With much orange brown sand (tank surround) from 1.5m. Faint hydrocarbon odour. (RECENT DEMOLITION).
1.6	D		(2.0)		
			2.0		South wall of tank sarcophagus exposed at 0.5m bgl, 200mm wide mortar jointed brick construction. Pit terminated on solid obstruction (concrete slab) at 2.0m.

Pit inside tank sarcophagus

Hole No TP 7

Water strikes: Dry
Water level:
Pit sides: Overbreak in Made Ground

Depth m/mm	Sample Type	Test Type & Value	Depth (Thickness)	Key	Soil Description
			200	MADE GROUND	MADE GROUND comprising crushed concrete, brick and blacktop fragments, occasional metals. (RECENT DEMOLITION)
			(500)	TOPSOIL	
1.5	D		700	CLAY	Dark brown slightly sandy clay BURIED TOPSOIL with occasional fine gravel of flint and charcoal.
3.0	D		(2.6)		(Firm) brown with dark orange brown veining CLAY with occasional fine and medium flint gravel. (BRICKEARTH).
					Grey stained patch with hydrocarbon odour in northern end of pit from 1.4m. Widespread greenish grey discolouration and strong odour by 2.4m. Distinct petrol-like odour at 3m.
			3.3	CLAY	
			(500)		(Stiff) orange brown, grey and buff slightly gravelly CLAY.
			3.8	CLAY	
			4.0		Hydrocarbon odour diminishes with depth.
					(Stiff) pale grey slightly sandy CLAY.
					Only faint hydrocarbon odour.

▽: Perth Penetration Test, 'N' value; ▼: Standard Penetration Test, 'N' values; ⊥: Unconfined Compression Strength by hand penetrometer, kN/m2;
V: Shear Vane test, kN/m2; X: CBR by Mexe cone penetrometer, %; D: Disturbed sample; U: Undisturbed sample; B: Bulk sample; W: Water sample

Southern Testing
Environmental & Geotechnical

TEST HOLE LOG

National Grid Reference	TQ 156 031		
Job No	J9415	Date	02/11/2007
Logged by	LDM	Engineer	LDM

Site : 24 Lyndhurst Road, Worthing

Client : Roffey Homes

Excavation Method : CAT backhoe

Hole No TP 8

Water strikes: Dry

Water level:

Pit sides: Stable

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description
		150 (150)	BLACKTOP	Blacktop (50mm thick) over loosely bound bituminous gravel (100mm thick).
500	D	400 (350)	MADE GROUND	MADE GROUND comprising crushed brick and concrete.
900 1.0	D 1B	750 1.0	TOPSOIL	Dark brown slightly sandy clay BURIED TOPSOIL with occasional fine gravel of flint and charcoal.
			CLAY	150mm plastic pipe at c0.6m, across pit.
				Firm (medium strength) brown CLAY. (BRICKEARTH)

Pit terminated at 1m due to services.

Hole No

Water strikes:

Water level:

Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description

Hole No

Water strikes:

Water level:

Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description

Hole No

Water strikes:

Water level:

Pit sides:

Depth m/mm	Sample Type or Test Type & Value	Depth (Thickness)	Key	Soil Description

▽: Perth Penetration Test, 'N' value; ▼: Standard Penetration Test, 'N' values; ⊥: Unconfined Compression Strength by hand penetrometer, kN/m2;
V: Shear Vane test, kN/m2; X: CBR by Mexe cone penetrometer, %; D: Disturbed sample; U: Undisturbed sample; B: Bulk sample; W: Water sample

APPENDIX B

Contamination Test Results

ALcontrol Technichem

Heron Drive,
Langley,
Slough SL3 8XP
tel: 01753 212500
fax: 01753 212501
email: langley@alcontrol.co.uk

Lawrence Mockett
Southern Testing
Keeble House
Stuart Way
East Grinstead
West Sussex
RH19 4QA

23 November 2007

TEST REPORT

Our Report Number: 07-41493

Your Order Reference: STL4574C

24 soil samples submitted for analysis on 06/11/2007

Project Name: 24 Lyndhurst Road, Worthing

Project Code: J9415

Laboratory analysis started on 07/11/2007
All laboratory analysis completed by 23 November 2007

[redacted]
Rexona Rahman
Analytical Reporting Manager
ALCONTROL TECHNICHEM

[redacted]
Sharon Gough
Project Co-Ordinator
ALCONTROL TECHNICHEM

Test methods are documented in house procedures or where appropriate standard methods. Non accredited tests (if applicable) are identified on each page. Procedures for sampling are outside the scope of the laboratory UKAS accreditation. Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation. All samples connected with this report , including any 'on hold', will be stored and disposed of according to company policy. A copy of this policy is available on request.

ALcontrol Technichem is a trading division of ALcontrol UK Limited.
Registered Office: Templeborough House, Mill Close, Rotherham S60 1BZ. Registered in England and Wales No. 4057291

ALcontrol Technichem
Sample Description

Job Number: 07-41493
Client: Southern Testing
Project Code: J9415

Matrix: Soil
Project Name: 24 Lyndhurst Road, Worthing

Laboratory Reference No	Sample Reference	Sample Depth (m)	Date Sampled	Sample Description
275504	TP1	0.85	-	Brown sandy clay
275505	TP2	0.8	-	Brown sandy clay with gravel
275506	TP2	1	-	Brown sandy clay
275507	TP5	0.45	-	Brown sandy clay with gravel and brick
275508	TP5	0.75	-	Brown sandy clay
275509	TP8	0.5	-	Brown sandy clay with gravel
275510	TP1	0.85	-	Brown clay
275511	TP1	4.1	-	Light brown sandy clay
275512	TP2	0.8	-	Brown sandy clay with gravel
275513	TP3	0.35	-	Brown sand with gravel and brick
275514	TP3	0.8	-	Brown sandy clay with gravel
275515	TP3	3.5	-	Light brown sandy clay with gravel
275516	TP4	0.25	-	Brown sand with gravel
275517	TP4	0.5	-	Brown clay with gravel
275518	TP6A	0.6	-	Brown sandy clay with gravel
275519	TP6A	1.1	-	Brown clay
275520	TP6A	2.4	-	Brown clay
275521	TP6A	3.4	-	Dark grey clay
275522	TP6A	3.9	-	Light brown sandy clay with gravel
275523	TP6A	4.4	-	Light grey sandy clay
275524	TP6B	1.6	-	Light brown sand with gravel
275525	TP7	1.5	-	Dark brown clay with gravel
275526	TP7	3	-	Brown clay
275527	TP8	0.5	-	Dark brown sandy clay with rubble and gravel

[redacted]

CERTIFICATE OF ANALYSIS

Received	24 soil samples submitted for analysis on 06/11/2007
On	06/11/2007
Details	Soil
STL Ref	J9415 - 24 Lyndhurst Road, Worthing - Lawrence Mockett

Sample Ref:		TP1	TP2	TP2	TP5	TP5	TP8	TP1	TP1
Depth unit	m	0.85	0.80	1.00	0.45	0.75	0.50	0.85	4.10
Lab ID		275504	275505	275506	275507	275508	275509	275510	275511
	units								
pH Value		6.9	7.2	7.4	7.5	7.6	7.4	-	-
Asbestos		Absent	Absent	Absent	Absent	Absent	Absent	-	-
Asbestos Description									
Asbestos Type									
Total Arsenic (As)	mg/kg	7.8	20	9.1	24	7.4	15	-	-
Total Cadmium (Cd)	mg/kg	< 0.5	0.6	< 0.5	< 0.5	< 0.5	< 0.5	-	-
Total Chromium (Cr)	mg/kg	24	15	20	17	21	18	-	-
Hexavalent Chromium (CrVI)	mg/kg								
Total Copper (Cu)	mg/kg	13	59	17	90	16	29	-	-
Total Lead (Pb)	mg/kg	29	270	960	390	43	190	-	-
Total Mercury (Hg)	mg/kg	< 0.6	< 0.6	< 0.6	0.8	< 0.6	0.8	-	-
Total Nickel (Ni)	mg/kg	15	17	11	21	18	13	-	-
Total Selenium (Se)	mg/kg	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	< 2.5	-	-
Total Zinc (Zn)	mg/kg	56	320	57	170	54	130	-	-
Phenol	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	-	-
Total Cyanide (CN)	mg/kg	< 1	< 1	< 1	< 1	< 1	< 1		-
Free Cyanide	mg/kg								
Complex Cyanide	mg/kg								
Thiocyanate as SCN	mg/kg								
Total Sulphate (SO_4)	mg/kg								
Soluble Sulphate* (SO_4)	g/l	< 0.02	0.07	0.15	0.04	0.04	0.1	-	-
Sulphide (S)	mg/kg	< 10	< 10	< 10	< 10	< 10	< 10	-	-
Toluene Extractable Material	%								
Benzo (a) pyrene	mg/kg	< 0.1	0.97	< 0.1	0.25	< 0.1	< 0.1	-	-
Total of 10 Dutch PAHs	mg/kg	<1	8.03	0.31	1.98	<1	0.14	-	-
Total of 16 EPA PAHs	mg/kg	ND	11.65	ND	2.81	ND	ND	-	-
Elemental Sulphur	mg/kg								
Wt. loss on drying	% of wet	18.1	16.9	18.5	19.9	17.7	20.9	20	14
Retained on 2mm sieve	% of dry	< 0.1	20	15	8.9	< 0.1	< 0.1	-	-
EPH/GC	mg/kg	-	-	-	-	-	-	11	5
Organic Matter	%	0.78	12	1.3	7.4	1	3.6	-	-
Organic Carbon	%	0.45	6.7	0.73	4.3	0.59	2.1	-	-
-- dependent option	* 1:2 Extract								
EXTRAS									
Moisture Content (Dry Weight)	%	22	20.3	22.6	24.8	21.5	26.4	25	18.2
Material Passing a 2mm Sieve	%	100	80	85	91	100	100	-	-
EPH (C10-C12)	mg/kg	-	-	-	-	-	-	< 5	< 5
EPH (C12-C16)	mg/kg	-	-	-	-	-	-	< 5	< 5
EPH (C16-C21)	mg/kg	-	-	-	-	-	-	< 5	< 5
EPH (C21-C36)	mg/kg	-	-	-	-	-	-	< 5	< 5
EPH (C36-C40)	mg/kg	-	-	-	-	-	-	< 5	< 5
EPH Aliphatics (C10-40)	mg/kg	-	-	-	-	-	-	-	-

[redacted]

CERTIFICATE OF ANALYSIS

Report: 24 soil samples submitted for batching on 08/17/2007

Results: Test - 24 hour turnaround, based on Mackay Laboratories - guidelines

| Client: | Test | | |

CERTIFICATE OF ANALYSIS

Received	24 soil samples submitted for analysis on 06/11/2007
On	06/11/2007
Details	Soil
STL Ref	J9415 - 24 Lyndhurst Road, Worthing - Lawrence Mockett

Sample Ref:		TP6A	TP6A	TP6A	TP6A	TP6B	TP7	TP7	TP8
Depth unit	m	2.40	3.40	3.90	4.40	1.60	1.50	3.00	0.50
Lab ID		275520	275521	275522	275523	275524	275525	275526	275527
	units								
pH Value		-	-	-	-	-	-	-	-
Asbestos		-	-	-	-	-	-	-	-
Asbestos Description									
Asbestos Type									
Total Arsenic (As)	mg/kg	-	-	-	-	-	-	-	-
Total Cadmium (Cd)	mg/kg	-	-	-	-	-	-	-	-
Total Chromium (Cr)	mg/kg	-	-	-	-	-	-	-	-
Hexavalent Chromium (CrVI)	mg/kg								
Total Copper (Cu)	mg/kg	-	-	-	-	-	-	-	-
Total Lead (Pb)	mg/kg	-	-	-	-	-	-	-	-
Total Mercury (Hg)	mg/kg	-	-	-	-	-	-	-	-
Total Nickel (Ni)	mg/kg	-	-	-	-	-	-	-	-
Total Selenium (Se)	mg/kg	-	-	-	-	-	-	-	-
Total Zinc (Zn)	mg/kg	-	-	-	-	-	-	-	-
Phenol	mg/kg	-	-	-	-	-	-	-	-
Total Cyanide (CN)	mg/kg	-	-	-	-	-	-	-	-
Free Cyanide	mg/kg								
Complex Cyanide	mg/kg								
Thiocyanate as SCN	mg/kg								
Total Sulphate (SO_4)	mg/kg								
Soluble Sulphate* (SO_4)	g/l	-	-	-	-	-	-	-	-
Sulphide (S)	mg/kg	-	-	-	-	-	-	-	-
Toluene Extractable Material	%								
Benzo (a) pyrene	mg/kg	-	-	-	-	-	-	-	-
Total of 10 Dutch PAHs	mg/kg	-	-	-	-	-	-	-	-
Total of 16 EPA PAHs	mg/kg	-	-	-	-	-	-	-	-
Elemental Sulphur	mg/kg								
Wt. loss on drying	% of wet	16.9	15.4	11.4	15.5	10.5	21.2	14.8	21.5
Retained on 2mm sieve	% of dry	-	-	-	-	-	-	-	-
EPH/GC	mg/kg	9	-	9	9	510	11	-	-
Organic Matter	%	-	-	-	-	-	-	-	-
Organic Carbon	%	-	-	-	-	-	-	-	-
-- dependent option	* 1:2 Extract								
EXTRAS									
Moisture Content (Dry Weight)	%	20.4	18.3	12.9	18.3	11.8	26.9	17.4	27.4
Material Passing a 2mm Sieve	%	-	-	-	-	-	-	-	-
EPH (C10-C12)	mg/kg	< 5	-	< 5	< 5	< 5	< 5	-	-
EPH (C12-C16)	mg/kg	< 5	-	< 5	< 5	6	< 5	-	-
EPH (C16-C21)	mg/kg	< 5	-	< 5	< 5	43	< 5	-	-
EPH (C21-C36)	mg/kg	< 5	-	< 5	< 5	370	< 5	-	-
EPH (C36-C40)	mg/kg	< 5	-	< 5	< 5	94	< 5	-	-
EPH Aliphatics (C10-40)	mg/kg	-	-	-	-	-	-	-	6

[redacted]

CERTIFICATE OF ANALYSIS

Received	24 soil samples submitted for analysis on 06/11/2007
On	06/11/2007
Details	Soil
STL Ref	J9415 - 24 Lyndhurst Road, Worthing - Lawrence Mockett

Sample Ref:		TP1	TP2	TP2	TP5	TP5	TP8
Depth unit	m	0.85	0.80	1.00	0.45	0.75	0.50
Lab ID		275504	275505	275506	275507	275508	275509
Naphthalene	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	0.12	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	0.81	0.11	0.17	< 0.1	< 0.1
Anthracene	mg/kg	< 0.1	0.22	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	mg/kg	< 0.1	2.4	0.2	0.52	< 0.1	0.14
Pyrene	mg/kg	< 0.1	2.1	0.15	0.45	< 0.1	0.13
Benzo (a) anthracene	mg/kg	< 0.1	0.99	< 0.1	0.26	< 0.1	< 0.1
Chrysene	mg/kg	< 0.1	1	< 0.1	0.29	< 0.1	< 0.1
Benzo (b) fluoranthene	mg/kg	< 0.1	1.3	< 0.1	0.37	< 0.1	< 0.1
Benzo (k) fluoranthene	mg/kg	< 0.1	0.52	< 0.1	0.16	< 0.1	< 0.1
Benzo (a) pyrene	mg/kg	< 0.1	0.97	< 0.1	0.25	< 0.1	< 0.1
Indeno (1,2,3-cd) pyrene	mg/kg	< 0.1	0.51	< 0.1	0.14	< 0.1	< 0.1
Dibenzo (a,h) anthracene	mg/kg	< 0.1	0.13	< 0.1	< 0.1	< 0.1	< 0.1
Benzo (g,h,i) perylene	mg/kg	< 0.1	0.61	< 0.1	0.19	< 0.1	< 0.1
Total of 10 Dutch PAHs	mg/kg	<1	8.03	0.31	1.98	<1	0.14
Total 16 EPA PAH	mg/kg	ND	11.65	ND	2.81	ND	ND

‡ Limits raised due to matrix interference.
ND denotes not detected

[redacted]

ALcontrol Technichem
Table Of Results

Job Number : 07-41493
Matrix : Soil
Project Code: J9415

Project Name: 24 Lyndhurst Road, Worthing
Client : Southern Testing

Sample Reference	TP6A	TP7				Method No	Units	LOD
Sample Depth (m)	3.40	3.00						
Date Sampled	-	-						
Date Scheduled	06/11/07	06/11/07						
Laboratory Reference No	275521	275526						
Analysis								
** CWG SUITE **								
Aliphatic C5-C6	0.38	0.30				CWGS	mg/kg	0.01
Aliphatic >C6-C8	3.7	0.78				CWGS	mg/kg	0.01
Aliphatic >C8-C10	0.99	0.65				CWGS	mg/kg	0.01
Aliphatic >C10-C12	0.51	0.93				CWGS	mg/kg	0.01
Aliphatic >C12-C16	< 5	< 5				CWGS[I]	mg/kg	5
Aliphatic >C16-C35	8.0	< 5				CWGS[I]	mg/kg	5
Aliphatic >C35-C44	< 5	< 5				CWGS	mg/kg	5
Total Aliphatics (C5-C44)	14	< 5				CWGS	mg/kg	5
Aromatic C6-C7	< 0.01	< 0.01				CWGS	mg/kg	0.01
Aromatic >C7-C8	< 0.01	< 0.01				CWGS	mg/kg	0.01
Aromatic >C8-C10	1.5	0.98				CWGS	mg/kg	0.01
Aromatic >C10-C12	0.77	1.4				CWGS	mg/kg	0.01
Aromatic >C12-C16	7.6	< 5				CWGS[I]	mg/kg	5
Aromatic >C16-C21	5.7	< 5				CWGS[I]	mg/kg	5
Aromatic >C21-C35	5.4	< 5				CWGS[I]	mg/kg	5
Total Aromatics (C5-C44)	21	< 5				CWGS	mg/kg	5
Aromatic >C35-C44	< 5	< 5				CWGS	mg/kg	5
Volatile Hydrocarbons (C5-C12)	7.9	5.0				CWGS	mg/kg	0.01
Extractable Hydrocarbons (C12-C44)	27	< 5				CWGS	mg/kg	5
Total Hydrocarbons (C5-C44)	35	5.0				CWGS	mg/kg	5
MTBE	< 0.010	< 0.010				CWGS[IM]	mg/kg	0.01
Benzene	< 0.010	< 0.010				CWGS[IM]	mg/kg	0.01
Toluene	< 0.010	< 0.010				CWGS[IM]	mg/kg	0.01
Ethylbenzene	< 0.010	< 0.010				CWGS[IM]	mg/kg	0.01
m,p-Xylenes	< 0.010	< 0.010				CWGS[IM]	mg/kg	0.01
o-Xylene	< 0.010	< 0.010				CWGS[IM]	mg/kg	0.01
1,3,5-Trimethylbenzene	0.016	< 0.010				CWGS[IM]	mg/kg	0.01
1,2,4-Trimethylbenzene	0.015	< 0.010				CWGS[IM]	mg/kg	0.01

[I] ISO 17025 accredited.
[M] MCERTS accredited for sand, loam and clay.

ALcontrol Technichem
EPH Description

Job Number: 07-41493
Client: Southern Testing
Project Code: J9415

Matrix: Soils
Project Name: 24 Lyndhurst Road, Worthing

Laboratory Reference No	Sample Reference	Sample Depth (m)	Date Sampled	EPH Description
275510	TP1	0.85	-	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
275511	TP1	4.1	-	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
275513	TP3	0.35	-	The sample chromatogram exhibits a trace primarily consistent with a degraded diesel.
275514	TP3	0.8	-	The sample chromatogram exhibits a hump of unresolved complex material eluting from C16 to C40.
275515	TP3	3.5	-	The sample chromatogram exhibits a hump of unresolved complex material eluting from C16 to C40.
275516	TP4	0.25	-	The sample chromatogram exhibits a hump of unresolved complex material eluting from C14 to beyond C40.
275519	TP6A	1.1	-	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
275520	TP6A	2.4	-	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.

[redacted]

ALcontrol Technichem
EPH Description

Job Number: 07-41493
Client: Southern Testing
Project Code: J9415

Matrix: Soils
Project Name: 24 Lyndhurst Road, Worthing

Laboratory Reference No	Sample Reference	Sample Depth (m)	Date Sampled	EPH Description
275522	TP6A	3.9	-	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
275523	TP6A	4.4	-	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
275524	TP6B	1.6	-	The sample chromatogram exhibits a hump of unresolved complex material eluting from C14 to beyond C40, overlain by a series of peaks consistent with PAHs.
275525	TP7	1.5	-	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.

[redacted]

ALcontrol Technichem
EPH Description - After Cleanup

Job Number: 07-41493
Client: Southern Testing
Project Code: J9415

Matrix: Soils
Project Name: 24 Lyndhurst Road, Worthing

Laboratory Reference No	Sample Reference	Sample Depth (m)	Date Sampled	EPHClean Description
275512	TP2	0.8	-	The sample chromatogram exhibits a hump of unresolved complex material eluting from C16 to C40.
275517	TP4	0.5	-	The sample chromatogram exhibits a hump of unresolved complex material eluting from C16 to C34.
275518	TP6A	0.6	-	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.
275527	TP8	0.5	-	The sample chromatogram exhibits too little GC-FID amenable material to provide qualitative analysis.

[redacted]

ALcontrol Technichem
Methods Accreditation Status

07-41493
24 Lyndhurst Road, Worthing
J9415

Analysis (Soil)	Method Reference and Accreditation Status	Unit	Reporting Limit
Moisture Content (Dry Weight)		%	0.1
Moisture Content (Wet Weight)		%	0.1
Asbestos (Screen)	001a		
Asbestos Description			
Asbestos Type			
Material Retained on a 2mm Sieve	021	%	0.1
Material Passing a 2mm Sieve	021	%	0.1
Arsenic	069S[IM]	mg/kg	3
Cadmium	069S[IM]	mg/kg	0.5
Chromium	069S[IM]	mg/kg	10
Chromium (Hexavalent)			
Copper	069S[IM]	mg/kg	5
Lead	069S[IM]	mg/kg	10
Mercury	069S[IM]	mg/kg	0.6
Nickel	069S[IM]	mg/kg	4
Selenium	069S[IM]	mg/kg	2.5
W/S Sulphate as SO4	074[IM]	g/l	0.02
Zinc	069S[IM]	mg/kg	10
Total Cyanide	061S[IM]	mg/kg	1
Organic Matter	092[I]	%	0.2
Organic Carbon	092[IM]	%	0.1
pH	084S[IM]	pH Units	1
Acid Soluble Sulphide	008[IM]	mg/kg	10
** EPH SUITE **			
EPH (C10-C40)	070S[IM]	mg/kg	5
** PCB SUITE **			
PCB Congener 28			
PCB Congener 52			
PCB Congener 101			
PCB Congener 118			
PCB Congener 138			
PCB Congener 153			
PCB Congener 180			
PCB's (Sum of ICES Congeners)			
** PHENOLS SUITE **			
Phenol	020S[IM]	mg/kg	0.1
** EXTRAS **			
EPH (C10-C12)	070S	mg/kg	5
EPH (C12-C16)	070S	mg/kg	5
EPH (C16-C21)	070S	mg/kg	5
EPH (C21-C36)	070S	mg/kg	5
EPH (C36-C40)	070S	mg/kg	5
EPH Aliphatics (C10-40)	070S	mg/kg	5

I Determination is Accredited to ISO17025
M Determination is Accredited to MCERTS (sand, loam and clay matrices)

ALcontrol Technichem
Methods Accreditation Status

07-41493
24 Lyndhurst Road, Worthing
J9415

Analysis (Soil)	Method Reference and Accreditation Status	Unit	Reporting Limit
Naphthalene	022S[IM]	mg/kg	0.1
Acenaphthylene	022S[IM]	mg/kg	0.1
Acenaphthene	022S[IM]	mg/kg	0.1
Fluorene	022S[IM]	mg/kg	0.1
Phenanthrene	022S[IM]	mg/kg	0.1
Anthracene	022S[IM]	mg/kg	0.1
Fluoranthene	022S[IM]	mg/kg	0.1
Pyrene	022S[IM]	mg/kg	0.1
Benzo(a)anthracene	022S[IM]	mg/kg	0.1
Chrysene	022S[IM]	mg/kg	0.1
Benzo(b)fluoranthene	022S[IM]	mg/kg	0.1
Benzo(k)fluoranthene	022S[IM]	mg/kg	0.1
Benzo(a)pyrene	022S[IM]	mg/kg	0.1
Indeno(1,2,3-cd)pyrene	022S[IM]	mg/kg	0.1
Dibenzo(a,h)anthracene	022S[IM]	mg/kg	0.1
Benzo(g,h,i)perylene	022S[IM]	mg/kg	0.1
PAH (Sum of EPA 16)	022S[I]	mg/kg	1.6

I Determination is Accredited to ISO17025
M Determination is Accredited to MCERTS (sand, loam and clay matrices)

ALcontrol Technichem
Table Of Results - Appendix

Job Number : 07-41493

Project Code: J9415

Project Name: 24 Lyndhurst Road, Worthing
Client : Southern Testing

Summary of methods contained within report :

Method No.	Reference	Description	Wet/Dry Analysis
061S	In-house method based on Method 4500-CN, "Standard Methods for the Examination of Water and Waste Water", APHA AWWA WEF, Edition 18, 1992	Determination of cyanides and thiocyanate in soil samples by continuous flow colorimetry (Skalar)	W
022S	In-house method	Determination of PAH compounds in soil samples by hexane / acetone extraction followed by GC-MS detection	W
020S	In-house method based on Second Site Property: Environmental Assessment Guidance Version 3: March 2003	Determination of methanol/water based mobile phase extractable phenols in soil samples by HPLC with electrochemical detection	W
008	In-house method adapted from MEWAM "Sulphide in Waters and Effluents", HMSO, 1983	Determination of sulphide in soil samples by sulphuric acid addition, absorption of liberated hydrogen sulphide in sodium hydroxide / ascorbic acid buffer solution and ion selective electrode detection	W
CWGS	In-house method based on "Total Petroleum Hydrocarbon Criteria Working Group" series, 1998-9	Determination of "CWG" banded petroleum hydrocarbons in soil samples using a combination of headspace GC-FID (C5-C12) and hexane:acetone extraction / silica-alumina aliphatic - aromatic split / GC-FID (C12-C35) techniques with banding by comparison to alkane standards	W
070S	In-house method	Determination of hexane/acetone extractable hydrocarbons in soil by gas chromatography with flame ionisation detection. Note: UKAS accreditation only applies to C10-C40 and excludes other carbon banding.	W
084S	In-house method referencing BS1377: Part 3: 1990 and Second Site Property: Environmental Assessment Guidance Version 3: March 2003	Determination of pH by addition of water followed by electrometric measurement	D
074	In-house method based on BS1377 Part 3, "Chemical and Electrochemical Tests", 1990	Determination of 2:1 water soluble sulphate in soil samples by Inductively Coupled Plasma - Optical Emission Spectrometry (ICP-OES)	D
069S	In-house method based on MEWAM "Methods for the Determination of Metals in Soil", HMSO, 1986	Determination of metals in soil samples by aqua-regia digestion followed by ICP-OES detection	D

ALcontrol Technichem
Table Of Results - Appendix

Job Number : 07-41493

Project Code: J9415

Project Name: 24 Lyndhurst Road, Worthing
Client : Southern Testing

Summary of methods contained within report :

Method No.	Reference	Description	Wet/Dry Analysis
092	In-house method	Determination of organic matter in soil samples by combustion analyser	D
021	In-house method based on BS1377 Part 3, "Chemical and Electrochemical Tests", 1990	Determination of material passing a 2mm sieve by gravimetry	
001a	In-house method based on HSG 248	Visual screening of soil samples for fibrous material requiring further identification according to method 001 (note for samples > approximately 1kg it may be necessary to sub-sample prior to screening)	

Soil results are expressed on a dry weight basis. Where the test uses as-received sample, a moisture correction factor is applied to the wet weight result. This factor is determined gravimetrically using weight loss on drying at 30° (+/-5) C.

ALcontrol Technichem

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Lawrence Mockett
Southern Testing
Keeble House
Stuart Way
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RH19 4QA

03 December 2007

TEST REPORT

Our Report Number: 07-42123

Your Order Reference: STL4601C

1 water sample submitted for analysis on 16/11/2007

Project Name: 24 Lyndhurst Road, Worthing

Project Code: J9415

Laboratory analysis started on 17/11/2007
All laboratory analysis completed by 03 December 2007

[redacted]

Rexona Rahman
Analytical Reporting Manager
ALCONTROL TECHNICHEM

[redacted]

Project Co-Ordinator
ALCONTROL TECHNICHEM

Test methods are documented in house procedures or where appropriate standard methods. Non accredited tests (if applicable) are identified on each page. Procedures for sampling are outside the scope of the laboratory UKAS accreditation. Opinions and interpretations expressed herein are outside the scope of our UKAS accreditation. All samples connected with this report , including any 'on hold', will be stored and disposed of according to company policy. A copy of this policy is available on request.

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CERTIFICATE OF ANALYSIS

Received	1 water sample submitted for analysis on 16/11/2007
On	16/11/2007
Details	Water
STL Ref	J9415 - 24 Lyndhurst Road, Worthing - Lawrence Mockett

Sample Ref:		BH1
Depth unit	m	-
Lab ID		278250
	units	
Arsenic	mg/L	0.008
Boron	mg/L	0.13
Cadmium	mg/L	< 0.001
Chromium	mg/L	0.015
Copper	mg/L	< 0.005
Iron	mg/L	0.64
Lead	mg/L	< 0.005
Mercury	mg/L	< 0.00005
Nickel	mg/L	< 0.005
Selenium	mg/L	0.014
Zinc	mg/L	0.01
Ammonia as N	mg/L	< 0.05
Chemical Oxygen Demand	mg/L	72
Chloride	mg/L	46
Complex Cyanide	mg/L	
Electrical Conductivity	µS/cm	753
Free Cyanide	mg/L	< 0.02
pH	mg/L	6.7
Sulphate	mg/L	13
Sulphide	mg/L	< 0.05
Total Cyanide	mg/L	
Monohydric Phenol	mg/L	
Speciated Phenols/HPLC		
Phenol	ug/L	69
Cresols	ug/L	15
Xylenols & Ethylphenols	ug/L	7.1
Naphthols	ug/L	<0.5
Trimethylphenols	ug/L	1.3
Total Phenols	ug/L	92
Target PAHs (WHO 6)	ug/L	ND
Benz(b)fluoranthene	ug/L	<0.1
Benz(k)fluoranthene	ug/L	<0.1
Benz(a)pyrene	ug/L	<0.1
Benzo(g,h,i)perylene	ug/L	<0.1
Fluoranthene	ug/L	<0.1
Indeno(1,2,3,c,d)pyrene	ug/L	<0.1
EXTRAS		
Ammoniacal Nitrogen as NH4	mg/l	< 0.065
Butyl Phenols	mg/l	< 0.0005

[redacted]

CERTIFICATE OF ANALYSIS

Received	1 water sample submitted for analysis on 16/11/2007
On	16/11/2007
Details	Water
STL Ref	J9415 - 24 Lyndhurst Road, Worthing - Lawrence Mockett

Sample Ref.		BH1
Depth unit	m	-
Lab ID		278250
Naphthalene	mg/l	< 0.0001
Acenaphthylene	mg/l	< 0.0001
Acenaphthene	mg/l	< 0.0001
Fluorene	mg/l	< 0.0001
Phenanthrene	mg/l	< 0.0001
Anthracene	mg/l	< 0.0001
Fluoranthene	mg/l	< 0.0001
Pyrene	mg/l	< 0.0001
Benzo (a) anthracene	mg/l	< 0.0001
Chrysene	mg/l	< 0.0001
Benzo (b) fluoranthene	mg/l	< 0.0001
Benzo (k) fluoranthene	mg/l	< 0.0001
Benzo (a) pyrene	mg/l	< 0.0001
Indeno (1,2,3-cd) pyrene	mg/l	< 0.0001
Dibenzo (a,h) anthracene	mg/l	< 0.0001
Benzo (g,h,i) perylene	mg/l	< 0.0001
Total of 10 Dutch PAHs	mg/l	<1
Total 16 EPA PAH	mg/l	ND

ND denotes not detected

[redacted]

CERTIFICATE OF ANALYSIS

Received		1 water sample submitted for analysis on 10/17/2007	
On		10/17/2007	
Details		Water	
STL Ref		10415 - 24 Lyndhurst Road, Worthing - Lawrence Mockett	
Sample Ref:		SHB	
Depth unit	m	-	
Lab ID		052812	
Aliphatic C5-C8	mg/l	4.4	
Aliphatic >C8-C10	mg/l	0.33	
Aliphatic >C10-C12	mg/l	1.5	
Aliphatic >C12-C16	mg/l	1.4	
Aliphatic >C16-C21	mg/l	<0.01	
Aliphatic >C21-C35	mg/l	<0.01	
Aromatic C6-C7	mg/l	1.5	
Aromatic >C7-C8	mg/l	3.7	
Aromatic >C8-C10	mg/l	5.5	
Aromatic >C10-C12	mg/l	1.2	
Aromatic >C12-C16	mg/l	<0.01	
Aromatic >C16-C21	mg/l	<0.01	
Aromatic >C21-C35	mg/l	<0.01	
Extractable Hydrocarbons (C10-C35)	mg/l	<0.01	
"Total" Hydrocarbons (C5-C35)	mg/l	18.3	
MTBE	mg/l	2.1	
Benzene	mg/l	1.1	
Toluene	mg/l	3.7	
Ethylbenzene	mg/l	1.7	
m,p-Xylene	mg/l	0.49	
o-Xylene	mg/l	0.089	
1,3,5-Trimethylbenzene	mg/l	1.4	
1,2,4-Trimethylbenzene	mg/l		

ALcontrol Technichem
Methods Accreditation Status

07-42123
24 Lyndhurst Road, Worthing
J9415

Analysis (Leachate)	Method Reference and Accreditation Status	Unit	Reporting Limit
Arsenic (Dissolved)	080W[I]	mg/l	0.005
Boron (Dissolved)	080W[I]	mg/l	0.005
Cadmium (Dissolved)	080W[I]	mg/l	0.001
Chromium (Dissolved)	080W[I]	mg/l	0.005
Copper (Dissolved)	080W[I]	mg/l	0.005
Iron (Dissolved)	080W[I]	mg/l	0.02
Lead (Dissolved)	080W[I]	mg/l	0.005
Mercury (Dissolved)	080W[I]	mg/l	0.00005
Nickel (Dissolved)	080W[I]	mg/l	0.005
Selenium (Dissolved)	080W[I]	mg/l	0.005
Zinc (Dissolved)	080W[I]	mg/l	0.005
pH	084W[I]	pH Units	1
Free Cyanide	061W[I]	mg/l	0.02
Ammoniacal Nitrogen as N	057W[I]	mg/l	0.05
Chloride	086W[I]	mg/l	10
Chemical Oxygen Demand	054W[I]	mg/l	10
Electrical Conductivity	084W[I]	uS/cm	20
Sulphide	055W[I]	mg/l	0.05
Sulphate as SO4	086W[I]	mg/l	10
** PHENOLS SUITE **			
Phenol	020W[I]	mg/l	0.0005
Cresols	020W[I]	mg/l	0.0005
Xylenols & Ethyl Phenols	020W[I]	mg/l	0.0005
Naphthols	020W[I]	mg/l	0.0005
Propyl or Trimethyl Phenols	020W[I]	mg/l	0.0005
Butyl Phenols	020W[I]	mg/l	0.0005
Phenols (Speciated Groups Sum)	020W[I]	mg/l	0.0005
** EXTRAS **			
Ammoniacal Nitrogen as NH4	057W[I]	mg/l	0.065

I Determination is Accredited to ISO17025
M Determination is Accredited to MCERTS (sand, loam and clay matrices)

[redacted]

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Methods Accreditation Status

07-42123
24 Lyndhurst Road, Worthing
J9415

Analysis (Leachate)	Method Reference and Accreditation Status	Unit	Reporting Limit
Naphthalene	022W[I]	mg/l	0.0001
Acenaphthylene	022W[I]	mg/l	0.0001
Acenaphthene	022W[I]	mg/l	0.0001
Fluorene	022W[I]	mg/l	0.0001
Phenanthrene	022W[I]	mg/l	0.0001
Anthracene	022W[I]	mg/l	0.0001
Fluoranthene	022W[I]	mg/l	0.0001
Pyrene	022W[I]	mg/l	0.0001
Benzo(a)anthracene	022W[I]	mg/l	0.0001
Chrysene	022W[I]	mg/l	0.0001
Benzo(b)fluoranthene	022W[I]	mg/l	0.0001
Benzo(k)fluoranthene	022W[I]	mg/l	0.0001
Benzo(a)pyrene	022W[I]	mg/l	0.0001
Indeno(1,2,3-cd)pyrene	022W[I]	mg/l	0.0001
Dibenzo(a,h)anthracene	022W[I]	mg/l	0.0001
Benzo(g,h,i)perylene	022W[I]	mg/l	0.0001
PAH (Sum of EPA 16)	022W[I]	mg/l	0.0001

I Determination is Accredited to ISO17025
M Determination is Accredited to MCERTS (sand, loam and clay matrices)

ALcontrol Technichem
Methods Accreditation Status

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24 Lyndhurst Road, Worthing
J9415

Analysis (Soil)	Method Reference and Accreditation Status	Unit	Reporting Limit
Aliphatic C5-C6	CWGW	mg/l	0.01
Aliphatic >C6-C8	CWGW	mg/l	0.01
Aliphatic >C8-C10	CWGW	mg/l	0.01
Aliphatic >C10-C12	CWGW	mg/l	0.01
Aliphatic >C12-C16	CWGW	mg/l	0.01
Aliphatic >C16-C21	CWGW	mg/l	0.01
Aliphatic >C21-C35	CWGW	mg/l	0.01
Aromatic C6-C7	CWGW	mg/l	0.01
Aromatic >C7-C8	CWGW	mg/l	0.01
Aromatic >C8-C10	CWGW	mg/l	0.01
Aromatic >C10-C12	CWGW	mg/l	0.01
Aromatic >C12-C16	CWGW	mg/l	0.01
Aromatic >C16-C21	CWGW	mg/l	0.01
Aromatic >C21-C35	CWGW	mg/l	0.01
Extractable Hydrocarbons (C12-C35)	CWGW	mg/l	0.01
Total Hydrocarbons (C5-C35)	CWGW	mg/l	0.01
MTBE	CWGW[I]	mg/l	0.005
Benzene	CWGW[I]	mg/l	0.005
Toluene	CWGW[I]	mg/l	0.005
Ethylbenzene	CWGW[I]	mg/l	0.005
m,p-Xylenes	CWGW[I]	mg/l	0.005
o-Xylene	CWGW[I]	mg/l	0.005
1,3,5-Trimethylbenzene	CWGW[I]	mg/l	0.005
1,2,4-Trimethylbenzene	CWGW[I]	mg/l	0.005

I Determination is Accredited to ISO17025
M Determination is Accredited to MCERTS (sand, loam and clay matrices)

[redacted]

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Table Of Results - Appendix

Job Number : 07-42123

Project Code: J9415

Project Name: 24 Lyndhurst Road, Worthing
Client : Southern Testing

Summary of methods contained within report :

Method No.	Reference	Description	Wet/Dry Analysis
CWGW	In-house method based on "Total Petroleum Hydrocarbon Criteria Working Group" series, 1998-9	Determination of "CWG" banded petroleum hydrocarbons in aqueous samples using a combination of headspace GC-FID (C5-C12) and pentane extraction / silica-alumina aliphatic - aromatic split / GC-FID (C12-C35) techniques with banding by comparison to alkane standards	
086W	In-house method	Determination of anion content in aqueous samples using ion chromatographic determination with electrical conductivity detector	
084W	In-house method based on Method 2510, "Standard Methods for the Examination of Water and Waste Water", APHA AWWA WEF, Edition 18, 1992	Determination of electrical conductivity of aqueous samples using a conductivity meter	
080W	In-house method based on MEWAM "Inductively Coupled Plasma Spectrometry", HMSO, 1996	Determination of metals in aqueous samples by nitric acid digestion followed by Inductively Coupled Plasma - Mass Spectrometry detection (ICP-MS)	
061W	In-house method based on Method 4500-CN, "Standard Methods for the Examination of Water and Waste Water", APHA AWWA WEF, Edition 18, 1992	Determination of cyanides and thiocyanate in aqueous samples by continuous flow colorimetry (Skalar)	
057W	In-house method based on Method 18.13 "Environmental Assessment Guidance" Version 3, Second Site Property, March 2003	Determination of ammoniacal nitrogen in aqueous samples by ion selective electrode	
055W	In-house method based on MEWAM "Sulphide in Waters and Effluents", HMSO, 1983	Determination of sulphide in aqueous samples by direct colourimetry	
054W	In-house method based on Method 5220, "Standard Methods for the Examination of Water and Waste Water", APHA AWWA WEF, Edition 18, 1992	Determination of chemical oxygen demand in aqueous samples by oxidation and colorimetric detection	
022W	In-house method	Determination of PAH compounds in aqueous samples by pentane extraction followed by GC-MS detection	

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Table Of Results - Appendix

Project Name: 24 Lyndhurst Road, Worthing
Client : Southern Testing

Job Number : 07-42123

Project Code: J9415

Summary of methods contained within report :

Method No.	Reference	Description	Wet/Dry Analysis
020W	In-house method based on Second Site Property: Environmental Assessment Guidance Version 3: March 2003	Determination of phenols in aqueous samples by HPLC with electrochemical detection	

Soil results are expressed on a dry weight basis. Where the test uses as-received sample, a moisture correction factor is applied to the wet weight result. This factor is determined gravimetrically using weight loss on drying at 30° (+/-5) C.

Southern Testing Laboratories, Inc. 4620 Lynbrook Drive, Baton Rouge, LA 70818 (225) 291-4000

ST Consult Limited Unit 14, Eastgate Business Park, Bridgwater Road, Bristol BS13 8AG, United Kingdom

Statistical Tests for Constrained Soils

Sample Group [1] : Buried Topsoil — **Test Suite** : STL Key Constituents Suite — **Job No** : 7A4DEC2007

Site : 24 Lyndhurst Road, Worthing — Client : Rothley Homes — Date : 14/DEC/2007

Constituent	No. of samples tested	Test Results and Statistics				Upper bound (US$_{EQ}$) [6]	Mean Value Test [1]			Landscaping to commercial suitability	Max Value Test [2]		Outlier check [3]
		Range	Arithmetic mean	Standard deviation			With plant uptake	Without plant uptake	Residential		Max value	Sample Ref. no. max value	
Acrylic (HH Assay)	5	7.2 - 12.3	9.4	2.2	4.0	8.2	8.2	8.2	8.2	8.2	12.3	8@ 0.5	N/A
Anthracene [a]	5	7.2 - 8.1	7.6	0.4		8.2	8.2	8.2	8.2	8.2	8.1	WS25 @ 0.5	N/A
Benzo(a)pyrene [a]	5	1.0 - 2.5	1.6	0.6	1.5	1.5	1.5	1.5	1.5	1.5	2.5	WS25 @ 0.5	1ssa
Benzo(b)fluoranthene [a]	5	1.4 - 2.2	1.8	0.3	0.7	1.9	1.9	1.9	1.9	1.9	2.2	WS25 @ 0.5	N/A
Benzo(ghi)perylene [a]	5	1.0 - 1.4	1.2	0.2	0.5	1.4	1.4	1.4	1.4	1.4	1.4	WS25 @ 0.5	N/A
Benzo(k)fluoranthene [a]	5	0.5 - 1.0	0.7	0.2	0.4	1.0	1.0	1.0	1.0	1.0	1.0	WS25 @ 0.5	N/A
Chrysene [a]	5	1.2 - 1.8	1.5	0.2	0.5	1.8	1.8	1.8	1.8	1.8	1.8	WS25 @ 0.5	N/A
Coronene [a]	5	0.5 - 0.9	0.7	0.2	0.4	0.9	0.9	0.9	0.9	0.9	0.9	WS25 @ 0.5	N/A
Dibenz(ah)anthracene [a]	5	0.5 - 0.8	0.6	0.1	0.3	0.8	0.8	0.8	0.8	0.8	0.8	WS25 @ 0.5	N/A
Fluoranthene [a]	5	2.5 - 4.2	3.4	0.7	1.5	4.2	4.2	4.2	4.2	4.2	4.2	TP2 @ 0.5	N/A
Fluorene [a]	5	0.5 - 0.8	0.6	0.1	0.3	0.8	0.8	0.8	0.8	0.8	0.8	TP2 @ 0.5	N/A
Indeno(123cd)pyrene [a]	5	0.5 - 0.9	0.7	0.2	0.4	0.9	0.9	0.9	0.9	0.9	0.9	TP2 @ 0.5	N/A
Naphthalene [a]	5	0.5 - 0.8	0.6	0.1	0.3	0.8	0.8	0.8	0.8	0.8	0.8	TP2 @ 0.5	N/A
Perylene [a]	5	0.5 - 0.8	0.6	0.1	0.3	0.8	0.8	0.8	0.8	0.8	0.8	TP2 @ 0.5	N/A
Phenanthrene [a]	5	2.5 - 4.2	3.4	0.7	1.5	4.2	4.2	4.2	4.2	4.2	4.2	TP2 @ 0.5	N/A
Pyrene [a]	5	2.1 - 3.5	2.8	0.6	1.2	3.5	3.5	3.5	3.5	3.5	3.5	TP2 @ 0.5	N/A
Total Coronene Concentration (CVC) [a, c]	0												
Total Petroleum Hydrocarbons (TPH) [a]	5	50 - 100	70	20	40	100	100	100	100	100	100	TP2 @ 0.5	N/A
Total Phenols (HPLC) [a]	5	0.5 - 0.8	0.6	0.1	0.3	0.8	0.8	0.8	0.8	0.8	0.8	TP2 @ 0.5	N/A
Total Phenols (Purgeable) [a]	5	0.5 - 0.8	0.6	0.1	0.3	0.8	0.8	0.8	0.8	0.8	0.8	TP2 @ 0.5	N/A
Total Polyaromatic Hydrocarbons (PAH) [a]	5	4.2 - 7.1	5.6	1.2	2.5	7.1	7.1	7.1	7.1	7.1	7.1	TP2 @ 0.5	N/A
Total Sulphate (as SO4) [a]	5	150 - 350	230	70	140	350	350	350	350	350	350	TP2 @ 0.5	N/A
Zinc (Zn) [a]	5	120 - 350	210	52	110	350	300	300	300	300	350	TP2 @ 0.5	1ssa

Notes: [1] : Statistical test to be applied to data set only where 5 or more samples are available. [2] : Assess whether maximum value does not exceed 1.5 times the mean value. [3] : Assess whether maximum value does not exceed 1.5 times the 95% UCL of the mean value. [4] : Statistical Validity Value (SVV) derived from CLEA software based on a standard soil with 1% organic matter content. Highlighted values may be applicable to the CLEA residential land use scenario. [5] : Critical Soil Contaminant Value (CSCV) based on assessment of the Human Health Risk to a Residential with Plant Uptake land use scenario as defined in CLR 10, DEFRA and EA, 2002. [6] : Upper bound (US$_{EQ}$) based on the Minitab 14 Statistical Software package, 2004. [7] : Statistical Validity Value based on the Normal Distribution. [8] : Assessment of data set to be carried out in accordance with the CLEA Report, Science Report SC050021/SR3, 2009. [a] : Determinand is a component of Total Petroleum Hydrocarbons (TPH). [b] : Determinand is a component of Total Polyaromatic Hydrocarbons (PAH). [c] : Determinand is a component of Total Phenols (HPLC). [d] : Determinand is a component of Total Phenols (Purgeable). [e] : Determinand is a component of Total Coronene Concentration (CVC). [f] : Determinand is a component of Total Sulphate (as SO4). [g] : Determinand is a component of Total Polyaromatic Hydrocarbons (PAH). [h] : Determinand is a component of Total Petroleum Hydrocarbons (TPH). [i] : Determinand is a component of Total Phenols (HPLC). [j] : Determinand is a component of Total Phenols (Purgeable). [k] : Determinand is a component of Total Coronene Concentration (CVC). [l] : Determinand is a component of Total Sulphate (as SO4). [m] : Determinand is a component of Total Polyaromatic Hydrocarbons (PAH). [n] : Determinand is a component of Total Petroleum Hydrocarbons (TPH). 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Soulham Testing Needle House, Stuart Way, East Cranstead, West Sussex RH19 4QA

ST Consult Twigden Barns, Blyworth Road, Cleeston, Northampton NN9 8MN

Statistical Tests for Constraminated Soils

Site : 42 Lyndhurst Road, Worthing **Client :** Rolfey Homes **Job No :** 1841.5

Sample Checked by : Bricksell **Test Suite :** ST1 Key Constituents Suite **Date :** 12/06/2007

Constituent tested	No. of samples tested	Test Results and Statistics				Mean Value Test [1]			Max Value Test [2]		Outlier check [3]
		Range	Arithmetic mean	Standard deviation	Upper bound ($US^{[a]}$)	With plant uptake	Residential Without plant uptake	Commercial/ Industrial	Max value	Sample Ref. of max value	
Arsenic (As) [a]	3	4 - 7.1	5.8	1.9	8.9	7.0	10	NT	9.1	1 @ 7.1	N/A
Cadmium (Cd) [a]	3	<0.5 - 4.2	2.2	1.7	5.2	3.4	4.1	50.0	4.2	1 @ 4.2	N/A
Total Chromium (Cr) [a]	3	20 - 25	22	2.5	27.0	26.1	30.2	1000	25.0	3 @ 25.0	N/A
Hexavalent Chromium (CrVI) [a, i]	0										N/A
Total Copper (Cu) [a]	3	20 - 30	25	5.0	34.0	32.1	37.9	10000	30.0	1 @ 30.0	N/A
Elemental Mercury [a]	3	<0.5 - 1.0	0.8	0.3	1.5	1.4	1.7	300	1.0	1 @ 1.0	N/A
Nickel (Ni) [a]	3	15 - 18	16	1.5	19.0	18.1	21.3	5000	18.0	1 @ 18.0	N/A
Selenium (Se) [a]	3	<2.5 - 3.1	2.8	0.3	3.4	3.3	3.8	13000	3.1	1 @ 3.1	N/A
Vanadium (V) [a]	3	8.0 - 9.2	8.6	0.6	9.8	9.5	10.3	1000	9.2	1 @ 9.2	N/A
Lead (Pb) [a, e]	3	350 - 420	390	40	460	450	490	3000	420	1 @ 420	N/A
Hexavalent Chromium (CrVI) [a, i]	0										N/A
Total Cyanide [a]	3	<1.0 - 1.2	1.1	0.1	1.3	1.2	1.4	1000	1.2	1 @ 1.2	N/A
Boron (B) [a]	3	1.4 - 1.8	1.6	0.2	1.9	1.8	2.1	50000	1.8	1 @ 1.8	N/A
Total Phenols (HPLC) [a]	3	<0.5 - 0.9	0.7	0.2	1.0	0.9	1.1	50000	0.9	1 @ 0.9	N/A
Asbestos [a]	0										N/A
Total Phenols (HPLC) [a]	3	<0.5 - 0.9	0.7	0.2	1.0	0.9	1.1	50000	0.9	1 @ 0.9	N/A
Total Organic Carbon [a]	3	0.4 - 0.6	0.5	0.1	0.7	0.6	0.8	1000	0.6	1 @ 0.6	N/A

Notes: [1] : Mean value calculated from test results is based on CLEA published soil guideline values only if at least 3 soil samples are tested. Otherwise the maximum value is used as an initial test. If the mean value fails the test, then the maximum value is used to assess compliance.

[2] : Pass the Mean Value Test if the mean value is less than the Max Value Test.

[3] : Pass the Outlier Test if the highest value is less than 3 times the second highest value.

[a] : Soil Guideline Value (SGV) derived from CLEA published report SR7: Soil Screening Values for Human Health (2009).

[b] : Soil Guideline Value (SGV) based on the Soil Code of Practice, Statutory Instrument 1989.

[c] : SGVs for As, Cd, Cr^{6+}, Pb, Ni, Se, Hg are set at a level to be protective of Allotment Users.

[d] : SGVs for Cr^{6+} based on a soil organic matter content of 1% for Dutch Standard Soil.

[e] : Assessment criteria for Lead (Pb) derived using the Integrated Exposure Uptake Biokinetic Model for Lead in Children (IEUBK).

[f] : Soil Guideline Value (SGV) based on a Soil Organic Matter content of 6% for Agricultural Land (MAFF), Revised 1998.

[g] : Assessment criteria for Benzo(a)pyrene based on Environmental Quality Standards in the Netherlands, 1989.

[h] : Soil Guideline Values (SGV) derived from CLEA model based on a standard soil with 2.5% organic matter. Assessment criteria for other organic compounds may be derived using the CLEA software in accordance with the Environment Agency's Science Report SC050021/SR7.

[i] : Hexavalent Chromium (CrVI) is assumed to be present in soil at 1/6th the concentration of total chromium.

[j] : Asbestos is qualitatively identified by analysis under polarised light microscopy. Not detected = ND.

[k] : Cyanide (free) is assumed to be present at 10% of the total cyanide concentration.

[l] : Phenols are assumed to be present at 90% of the total phenols concentration.

[m] : Organic matter content is assumed to be present at 50% of the total organic carbon concentration.

[n] : Where the use of Total Organic Carbon is specified, see Section 5 of CLEA Report SR7. Values are in mg/kg. ND = Not detected. NT = Not tested. N/A = Not applicable.

APPENDIX C

CLEA UK model report - Hydrocarbons

CLEA UK MODEL 2005 VERSION Version 1.0

Simulation Date:	13/12/2007	Site/plant Name:	Chemical Assessment
Type of Assessment:	Site/plant Assessment		

Company Name:	Solution Inc.
Person running Simulation:	LDM
Contact Number:	
Site Address:	Lyndhurst Road
	Worthing

Chemical	VCH_{equiv} compound with benzene exposure which is of concern?				VCH_{equiv} compound with benzene exposure which is of concern?				HCV_{equiv} compound with benzene exposure which is of concern?				Assessment Criteria (mg.kg^{-1})				ADE/HCV (dimensionless)	
	total		dermal		total		dermal		total		dermal		Site Specific Soil Concentration (mg.kg^{-1} dry weight soil)	Intrusion total & dermal			Initial	
	Initial	Dermal	Initial	Dermal	Initial	Dermal	Initial	Dermal	Initial	Dermal	Initial	Dermal	Initial HCV (mg.kg^{-1})	20% rule applied?	Initial HCV (mg.kg^{-1})	20% rule applied?		
Chemical																		
1,2,4-trimethylbenzene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	1.53E+03	No	1.53E+03	No	1.00E+00	1.00E+00
1,3,5-trimethylbenzene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	2.57E+03	No	1.00E+00	No	1.00E+00	1.00E+00
2-chlorotoluene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	5.79E+02	No	1.00E+00	No	1.00E+00	1.00E+00
4-chlorotoluene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	5.79E+02	No			1.00E+00	1.00E+00
Benzene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	1.23E+02	No			1.00E+00	1.00E+00
Ethylbenzene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	1.38E+03	No			1.00E+00	1.00E+00
Isopropylbenzene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	1.02E+02	No			1.00E+00	1.00E+00
Naphthalene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	1.38E+03	No			1.00E+00	1.00E+00
n-butylbenzene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	2.57E+03	No	1.00E+00	No	1.00E+00	1.00E+00
n-propylbenzene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	2.57E+03	No	1.00E+00	No	1.00E+00	1.00E+00
o-xylene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	2.57E+03	No	1.00E+00	No	1.00E+00	1.00E+00
p-isopropyltoluene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	2.57E+03	No	1.00E+00	No	1.00E+00	1.00E+00
sec-butylbenzene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	2.57E+03	No	1.00E+00	No	1.00E+00	1.00E+00
tert-butylbenzene	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No	2.57E+03	No	1.00E+00	No	1.00E+00	1.00E+00

Land-use selected: Commercial/Industrial Multiple Hazard Index

Land-use Parameters	Value	Class	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Land use area (A)	1	Area Class	1																	
Exposure Frequency (yr^{-1})																				
Inhalation rate, indoor	0.83	1.83E+03	1.83E+03	1.83E+03	1.83E+03	1.83E+03	1.83E+03	1.83E+03	1.83E+03											
Inhalation rate, outdoor	1.83	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03											
Inhalation rate, particulate	1.83	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03											
Inhalation rate, vapor	1.83	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03											
Ingestion rate, soil	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Ingestion rate, vapor	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Ingestion rate, particulate	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Exposure Duration (yr)																				
Exposure duration, indoor	1	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03											
Exposure duration, outdoor	1	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03											
Exposure duration, particulate	1	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03											
Averaging Time (yr)																				
Averaging time, carcinogens	70	2.56E+04	2.56E+04	2.56E+04	2.56E+04	2.56E+04	2.56E+04	2.56E+04	2.56E+04											
Averaging time, mutagens	70	2.56E+04	2.56E+04	2.56E+04	2.56E+04	2.56E+04	2.56E+04	2.56E+04	2.56E+04											
Averaging time, noncarcinogens	1	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03	3.65E+03											
Fraction Ingested (yr^{-1})																				
Fraction ingested, indoor	0.50	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00											
Fraction ingested, outdoor	0.50	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00											
Fraction ingested, particulate	0.50	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00											
Soil-skin Adherence Factor ($mg.cm^{-2}$)																				
Adherence factor, indoor	0.07	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02											
Adherence factor, outdoor	0.07	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02	5.00E-02											
Exposed skin fraction (unitless)																				
Exposed skin fraction, outdoor	0.05	3.80E-01	3.80E-01	3.80E-01	3.80E-01	3.80E-01	3.80E-01	3.80E-01	3.80E-01											
Exposed skin fraction, indoor	0.05	3.80E-01	3.80E-01	3.80E-01	3.80E-01	3.80E-01	3.80E-01	3.80E-01	3.80E-01											

Receptor selected: Industrial (IND)

Start Age Class	1	End Age Class	6	Exposure duration (total)	6	Averaging Time (total)	6

BUILDING PARAMETERS

Building type selected:	Residential - Multi-family (mixed use)		
Building Parameters	**Units**	**Value**	
Height to typical floor	m	3.00E+00	
Height to typical ceiling	m	2.70E+00	
Floor to floor height	m	3.00E+00	
Building type specific gross area	m^2	4.80E+03	
Building Parameters			
Number of floors		1.60E+00	
Number of basement floors		0.00E+00	
Number of underground parking floors		0.00E+00	
Number of elevators		1.00E+00	
Number of escalators		0.00E+00	
Number of residential units		4.00E+00	
Number of hotel rooms		0.00E+00	
Number of school classrooms		0.00E+00	
Number of hospital beds		0.00E+00	
Number of restaurant seats		0.00E+00	
Number of retail stores		0.00E+00	
Number of industrial workers		0.00E+00	
Number of data center racks		0.00E+00	
Number of other occupants		0.00E+00	
Average daily water use per occupant	gal/day/person	5.00E+01	
Average daily water use per unit floor area	gal/day/ft^2	1.04E-01	
Annual water use	m^3/year	1.20E+01	
Annual water use per unit floor area	m^3/year/m^2	2.50E-03	
Annual water use per occupant	m^3/year/person	3.00E+00	
Annual water use per unit	m^3/year/unit	3.00E+00	
Annual water use per unit floor area	m^3/year/m^2	6.25E-04	
Annual water use per hotel room	m^3/year/room	0.00E+00	
Annual water use per school classroom	m^3/year/classroom	0.00E+00	
Annual water use per hospital bed	m^3/year/bed	0.00E+00	
Annual water use per restaurant seat	m^3/year/seat	0.00E+00	
Annual water use per retail store	m^3/year/store	0.00E+00	
Annual water use per industrial worker	m^3/year/worker	0.00E+00	
Annual water use per data center rack	m^3/year/rack	0.00E+00	
Annual water use per other occupant	m^3/year/person	0.00E+00	
Annual water use per unit floor area	m^3/year/m^2	0.00E+00

Chemical	Oral				Dermal				Inhalation								background exposure (oral)	background exposure (inhalation)
	ingestion soil and soil derived indoor dust		consumption of sun-grown vegetables		skin contact with soil-derived indoor dust		skin contact with soil		inhalation of soil derived indoor dust		inhalation of soil dust		inhalation of vapours indoors		inhalation of vapours outdoor		calculated vapour model	dispersion factor for ambient air		
	ADE % Contribution	ADE Mean (ng.kg-1 bw.day-1)	ADE % Contribution	ADE Mean (ng.kg-1 bw.day-1)	ADE % Contribution	ADE Mean (ng.kg-1 bw.day-1)	ADE % Contribution	ADE Mean (ng.kg-1 bw.day-1)	ADE % Contribution	ADE Mean (ng.kg-1 bw.day-1)	ADE % Contribution	ADE Mean (ng.kg-1 bw.day-1)	ADE % Contribution	ADE Mean (ng.kg-1 bw.day-1)	soil air diffusion coefficient (cm2.s-1)	soil-vapour to indoor air attenuation coefficient (dimensionless)	young child (cm.s-1)	older child (cm.s-1)	adult (cm.s-1)		
Chemical																						
4,4'-DDD	1.78E+01	8.13E+00	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	4.30E-04	1.96E-04	1.11E-04	5.08E-05	3.38E-02	1.54E-02	8.43E+01	3.84E+01	3.48E-05	1.59E-05	4.21E-02	2.30E-06	2.00E+01	NAV	1.54E+01	1.75E+01
4,4'-DDE	4.23E+01	2.40E+01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	3.18E-04	1.81E-04	3.30E-04	1.87E-04	2.82E-02	1.60E-02	2.43E+01	1.38E+01	1.52E-05	8.62E-06	4.25E-02	2.41E-06	2.00E+01	NAV	1.54E+01	1.75E+01
4,4'-DDT	8.44E+01	1.38E+01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	2.05E-04	3.32E-05	1.32E-04	2.14E-05	3.38E-02	5.47E-03	1.23E+01	1.99E+00	4.42E-03	7.15E-04	4.53E-02	7.33E-03	2.00E+01	NAV	1.54E+01	1.75E+01
Aldrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
alpha Chlordane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
alpha Endosulfan	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
alpha Hexachlorocyclohexane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
beta Hexachlorocyclohexane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
cis-Chlordane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
cis-Nonachlor	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
cis-Permethrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
cis-Resmethrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
cis-Tetramethrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
cyfluthrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
cypermethrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
delta Hexachlorocyclohexane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
deltamethrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Dieldrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Endosulfan sulphate	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Endrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Endrin aldehyde	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Endrin ketone	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
gamma Chlordane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
gamma Hexachlorocyclohexane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Heptachlor	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Heptachlor epoxide	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Hexachlorobenzene	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Hexachlorobutadiene	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Hexachlorocyclopentadiene	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Hexachloroethane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Isodrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Kepone	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Methoxychlor	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Mirex	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Nonachlor	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Oxychlordane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Pentachlorobenzene	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Pentachloroethane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Pentachlorophenol	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Permethrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Resmethrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Tetramethrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
trans-Chlordane	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
trans-Nonachlor	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
trans-Permethrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
trans-Resmethrin	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00
Toxaphene	1.00E+00	1.22E-01	NAV	NAV	NAV	NAV	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.38E-02	4.13E-03	2.00E+01	NAV	9.30E-06	0.00E+00

HEALTHCARE VALUES

Chemical	TDI (kg day-1 bw)				IDI (kg day-1 bw)				MDI (kg day-1)			
	total	inhalation	total	none	total	inhalation	total	none	total	inhalation	total	none
<C10 aromatic	4.00E+01	2.70E+01	none	none	2.95E+05	2.70E+05	none	none	3.25E+05	2.70E+05	none	none
C10-C12 aliphatic	1.00E+02	2.60E+02	none	none	2.95E+05	2.60E+05	none	none	8.65E+05	2.60E+05	none	none
C8-C10 aromatic	2.00E+03	2.30E+03	none	none	2.95E+05	2.30E+05	none	none	4.43E+04	2.30E+04	none	none
C12-C16 Aliphatic	3.00E+01	none	none	none	2.95E+05	none	none	none	0.00E+00	0.00E+00	none	none
C12-C16 aromatic	2.00E+03	none	none	none	2.95E+05	none	none	none	0.00E+00	0.00E+00	none	none
C16-C21 Aliphatic	5.00E+03	none	none	none	2.95E+05	none	none	none	1.78E+04	0.00E+00	none	none
C16-C21 aromatic	3.00E+01	none	none	none	2.95E+05	none	none	none	0.00E+00	0.00E+00	none	none
C21-C32 Aliphatic	1.00E+02	2.60E+02	none	none	2.95E+05	2.60E+05	none	none	8.65E+05	2.95E+03	none	none
C21-C32 aromatic	4.00E+01	2.70E+01	none	none	2.95E+05	2.70E+05	none	none	3.25E+05	2.80E+05	none	none
C10-C12 aliphatic	1.00E+02	2.60E+02	none	none	2.95E+05	2.60E+05	none	none	8.65E+05	2.95E+03	none	none
C10<- C12 aromatic	4.00E+01	2.70E+01	none	none	2.95E+05	2.70E+05	none	none	3.25E+05	2.80E+05	none	none

Agency Physiologically based toxicokinetic

PHYSICO-CHEMICAL PROPERTIES

Chemical	Henry's Law Constant (dimensionless)	Reference Temperature (K)	Henry's Law Constant (atm.m3.mol-1)	Reference Temperature (K)	Henry's Law Constant at ambient temperature (dimensionless)	Enthalpy of vaporisation at boiling point (cal.mol-1)	Boiling Point (K)	Critical Temperature (K)	Air diffusion coefficient (m2.s-1)	Water diffusion coefficient (m2.s-1)	Relative atomic (molecular) mass (g - mol)	Vapour pressure at 10°C (Pa)	Aqueous solubility at 10°C (mg.L-1)	coefficient, log Koc (log(cm3-water.g-1 oc)	organic carbon - water distribution	octanol-water distribution coefficient	log Kow (dimensionless)	soil-water distribution coefficient, Kd (cm3 - water.g-1 - soil)	concentration ratio (cm3-water.g-soil)	Total soil concentration to pore water	dermal absorption fraction (dimensionless)	dry or fresh weight? (leaf) (dimensionless)	Type of soil-to-plant concentration factor,	dry or fresh weight? (root) (dimensionless)	Type of soil-to-plant concentration factor,	soil-to-plant concentration factor (leaf) (ug.g-1 FW plant over ug.cm-3 soil solution)	soil-to-plant concentration factor (root) (ug.g-1 FW plant over ug.cm-3 soil solution)	dust Enrichment Factors used?
C8-C10 aromatic	1.11E-05	5.98E+03	1.11E-05	5.98E+03	3.70E-01	7.49E+04	4.33E+03	6.32E+03	1.00E-02	1.00E-09	1.30E+03	6.38E+03	5.20E+01	2.30E+00	2.30E+00	2.30E+00	9.21E+00	9.21E+00	1.00E-01	RRRCSS	n/a	RRRCSS	n/a	2.50E+00	0.00E+00	5.55E+01	No
C8-C10 aliphatic	1.90E+00	5.98E+03	1.90E+00	5.98E+03	6.33E-01	8.80E+04	4.33E+03	6.32E+03	1.00E-02	1.00E-09	1.30E+03	6.38E+03	4.70E-01	2.30E+00	2.30E+00	2.30E+00	1.90E+03	1.90E+03	1.00E-01	RRRCSS	n/a	RRRCSS	n/a	0.00E+00	0.00E+00	4.45E+01	No
C8-C8 aliphatic	1.33E+00	5.98E+03	1.33E+00	5.98E+03	3.80E+01	8.04E+04	4.33E+03	6.32E+03	1.00E-02	1.00E-09	1.30E+03	6.38E+03	2.40E+00	2.30E+00	2.30E+00	2.30E+00	5.76E+01	5.76E+01	1.00E-01	RRRCSS	n/a	RRRCSS	n/a	0.00E+00	0.00E+00	1.15E+02	No
C12-C14 aromatic	1.04E-02	5.98E+03	1.04E-02	5.98E+03	1.04E-02	1.01E+04	4.91E+03	6.50E+03	1.00E-02	1.00E-09	3.45E+03	4.40E-02	9.00E-03	3.30E+00	3.30E+00	3.30E+00	3.52E+03	3.52E+03	1.00E-01	n/a	n/a	n/a	n/a	1.15E-02	8.14E-08	1.63E-02	No
C12-C14 aliphatic	1.30E+03	5.98E+03	1.30E+03	5.98E+03	1.46E+03	1.01E+04	4.91E+03	6.50E+03	1.00E-02	1.00E-09	1.30E+03	1.00E-01	5.20E-06	3.30E+00	3.30E+00	3.30E+00	1.32E+05	1.32E+05	1.00E-01	n/a	n/a	n/a	n/a	1.15E-02	1.63E-02	1.63E-02	No
C21-C22 aromatic	1.90E+02	5.98E+03	1.90E+02	5.98E+03	1.90E+02	1.13E+04	5.49E+03	7.26E+03	1.00E-02	1.00E-09	3.45E+03	4.40E-02	9.00E-03	3.30E+00	3.30E+00	3.30E+00	1.32E+05	1.32E+05	1.00E-01	n/a	n/a	n/a	n/a	0.00E+00	0.00E+00	0.00E+00	No
C12-C12 aliphatic	1.30E+03	5.98E+03	1.30E+03	5.98E+03	1.46E+03	1.01E+04	4.91E+03	6.50E+03	1.00E-02	1.00E-09	1.30E+03	1.11E-01	9.50E-01	3.30E+00	3.30E+00	3.30E+00	9.51E+04	9.51E+04	1.00E-01	n/a	n/a	n/a	n/a	0.00E+00	0.00E+00	0.00E+00	No
C10-C12 aromatic	1.18E-04	5.98E+03	1.18E-04	5.98E+03	2.96E+03	9.26E+04	4.62E+03	6.90E+03	1.00E-02	1.00E-09	1.30E+03	2.13E-02	2.50E-04	3.30E+00	3.30E+00	3.30E+00	2.63E+04	2.63E+04	1.00E-01	RRRCSS	n/a	RRRCSS	n/a	1.15E-02	1.63E-02	1.63E-02	No
C10-C12 aliphatic	1.33E+01	5.98E+03	1.33E+01	5.98E+03	3.33E+01	8.80E+04	4.62E+03	6.90E+03	1.00E-02	1.00E-09	1.30E+03	4.30E-01	1.20E-01	3.30E+00	3.30E+00	3.30E+00	1.19E+04	1.19E+04	1.00E-01	RRRCSS	n/a	RRRCSS	n/a	0.00E+00	0.00E+00	1.15E-02	No
C10-C10 aliphatic	1.90E+00	5.98E+03	1.90E+00	5.98E+03	4.75E+00	8.04E+04	4.62E+03	6.90E+03	1.00E-02	1.00E-09	1.30E+03	1.38E+00	3.40E-02	3.30E+00	3.30E+00	3.30E+00	1.51E+03	1.51E+03	1.00E-01	RRRCSS	n/a	RRRCSS	n/a	0.00E+00	0.00E+00	1.15E-02	No
C10-C13 aromatic	3.97E+00	5.98E+03	3.97E+00	5.98E+03	9.92E+00	8.88E+04	4.77E+03	7.10E+03	1.00E-02	1.00E-09	1.30E+03	6.38E+03	5.20E+01	2.30E+00	2.30E+00	2.30E+00	1.21E+01	1.21E+01	1.00E-01	RRRCSS	n/a	RRRCSS	n/a	2.33E+00	0.00E+00	3.51E+01	No
C10-C13 aliphatic	7.45E-01	5.98E+03	7.45E-01	5.98E+03	2.98E+00	8.88E+04	4.77E+03	7.10E+03	1.00E-02	1.00E-09	1.30E+03	6.38E+03	5.20E+01	2.30E+00	2.30E+00	2.30E+00	1.21E+01	1.21E+01	1.00E-01	RRRCSS	n/a	RRRCSS	n/a	2.33E+00	0.00E+00	3.51E+01	No

MEDIO CONSENTANEO

Chemical	Distribution of chemical in soil										Distribution in plant-soil boundary										Boundary Limits			
	total soil concentration	soil concentration	dissolved concentration	vapour concentration	soil concentration	dissolved concentration	vapour concentration	indoor vapour air concentration	outdoor vapour air concentration for Young Child	outdoor vapour air concentration for Older Child	outdoor vapour air concentration for Adults	outdoor dust air concentration	indoor dust air concentration	concentration in Brussels sprouts	concentration in cabbage	concentration in carrot	concentration in leafy salad	concentration in onion, leek, shallots	concentration in potatoes	pore water concentration	solubility maximum	% max	ambient source vapour concentration	saturated source vapour concentration	% max
	mg/kg	mg/kg	mg/L	mg/m³	mg/kg	mg/L	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/m³	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/L	mg/L		mg/m³	mg/m³	
>7.5-10 mmol/kg	1.33E+00	9.18E-01	1.83E-03	1.02E-01	1.48E+00	8.38E-03	1.20E-01	1.42E-03	4.04E-02	NAN	3.38E-02	5.10E-03	3.38E-01	1.43E-01	3.38E-01	1.44E+00	1.44E+00	1.81E-01	1.44E+00	5.30E-01	9.30E+01	1.00E+02	5.12E+04	1.52E+04	8.40E-01
>5-7.5 mmol/kg	2.33E+00	8.31E-01	1.51E-04	1.42E-03	1.22E+00	5.30E-03	1.22E-01	1.41E+00	1.38E-04	NAN	1.50E-02	8.66E-03	1.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.30E-01	1.00E+02	1.00E+05	1.22E+04	1.91E-01
>4-5 mmol/kg	1.50E+03	1.73E-01	1.25E-01	1.05E-03	9.40E-01	2.33E-04	3.80E-01	1.13E+00	1.73E-03	NAN	4.20E-02	4.20E-02	3.11E-03	3.11E-03	3.11E-03	3.11E-03	3.11E-03	3.11E-03	3.11E-03	2.40E+00	2.40E+00	1.00E+02	1.00E+05	5.03E+03	3.31E-02
>3.5-4 mmol/kg	3.50E+00	4.90E-02	1.80E-02	1.31E-01	5.18E-01	8.11E-02	3.42E-02	1.88E-03	2.03E-02	NAN	2.33E-02	2.31E-03	3.81E-03	1.51E-00	1.83E-02	1.83E-02	1.83E-02	1.83E-02	1.83E-02	9.00E-03	9.00E-03	1.00E+02	1.00E+05	1.78E-01	6.72E-01
>3-3.5 mmol/kg	1.22E+03	9.40E-01	4.70E-03	1.31E-01	9.30E-01	1.01E-01	4.70E-01	1.88E-03	2.03E-02	NAN	2.33E-02	2.31E-03	3.81E-03	1.34E-03	1.83E-02	1.34E-03	1.34E-03	1.34E-03	1.34E-03	5.20E-00	5.20E-00	1.00E+02	1.00E+05	2.83E+04	1.12E-01
>2.5-3 mmol/kg	1.28E+00	4.90E-01	1.80E-03	1.31E-01	1.01E-01	1.18E-01	1.31E-01	1.88E-03	2.03E-02	NAN	2.33E-02	2.31E-03	3.81E-03	8.74E-03	1.83E-02	8.74E-03	8.74E-03	8.74E-03	8.74E-03	3.60E-02	3.60E-02	1.00E+02	1.00E+05	7.18E+04	2.84E-01
>2-2.5 mmol/kg	1.02E+03	9.40E-01	9.30E-03	7.30E-03	9.40E-01	8.38E-02	2.63E-02	1.88E-03	2.03E-02	NAN	2.33E-02	2.31E-03	3.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.25E-00	9.25E-00	1.00E+02	1.00E+05	4.04E+04	1.60E-01
>1.5-2 mmol/kg	2.28E+00	9.18E-01	1.83E-03	7.30E-03	7.91E-01	1.20E-01	4.74E-01	1.88E-03	2.03E-02	NAN	2.33E-02	2.31E-03	3.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.25E-00	9.25E-00	1.00E+02	1.00E+05	9.13E+04	3.62E-01
>1-1.5 mmol/kg	2.33E+00	5.53E-01	5.14E-03	2.92E-02	4.74E-01	1.20E-01	4.74E-01	1.88E-03	2.03E-02	NAN	2.33E-02	2.31E-03	3.81E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.30E-04	1.30E-04	1.00E+02	1.00E+05	1.14E+05	4.52E-01
>0.5-1 mmol/kg	3.11E+00	1.53E-01	1.01E-01	1.13E-02	8.38E+00	3.32E-03	1.64E-01	4.88E-03	2.63E-02	NAN	3.02E-02	2.99E-03	4.94E-03	2.63E-03	2.37E-02	2.63E-03	2.63E-03	1.69E-02	2.37E-02	1.30E-03	1.30E-03	1.00E+02	1.00E+05	1.30E+05	4.52E-01
>0.25-0.5 mmol/kg	2.33E+00	2.13E-03	9.30E-04	1.63E-01	9.41E+00	1.83E-04	3.01E-02	1.41E-03	7.83E-03	NAN	9.45E-03	8.66E-03	1.50E-02	7.83E-03	7.05E-02	7.83E-03	7.83E-03	5.03E-02	7.05E-02	3.86E-03	3.86E-03	1.00E+02	1.00E+05	1.88E+04	6.54E-02
>0-0.25 mmol/kg	3.11E+00	1.73E-04	1.73E-01	1.42E-02	1.06E+01	9.38E-03	4.34E-02	1.53E-03	8.51E-03	NAN	1.02E-02	9.38E-03	1.63E-02	8.51E-03	7.66E-02	8.51E-03	8.51E-03	5.47E-02	7.66E-02	4.19E-03	4.19E-03	1.00E+02	1.00E+05	2.04E+04	7.10E-02

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BM TRADA CERTIFICATION

The Streif UK Building System

The **Streif UK** Building System is a timber frame closed panelled construction which is extremely robust & solid together with being weather proof and having excellent thermal and sound resistance. Our design and structural calculation services are also an integral part of our system and service.

The System's panels for walls are made up by a series of modular closed panels. The panels consist of timber frame construction clad with OSB (Oriented Strand Board) externally & Gypsum Fibreboard internally and insulated with Mineral wool filling and vapour diffusers. When bolted tightly together on site this strong and versatile combination is earthquake and hurricane proof and provides excellent air tightness, sound & thermal insulation. The windows & doors are preinstalled into the panels and made water tight as part of the process.

Streif UK Building System panels

are structural & this form of assembly provides rigidness, great strength and excellent responses to applied loads.

Streif UK Building System panels are manufactured at our production facility situated in Wiensheim in South West Germany.

The demand in the UK for OSM (off-site manufacturing) methods such as closed panelled technology is rapidly growing. This is being driven by many factors including the availability of skilled workers being in short supply and the requirement of housing associations / RSL's to meet the demands of Sir John Egan.

The **Streif UK** Building System is playing a major role in meeting this demand. Much higher levels of energy efficiency introduced in the revised Building Regulations in 2002 are challenging the more traditional methods of construction and forcing clients and all those engaged on projects to look at alternative ways of meeting the requirements more efficiently & economically. Fast build combined with the high energy efficiency together with minimal site wastage makes the **Streif UK** Building System and extremely cost effective way of achieving and in most case exceeding the new requirements.

The **Streif UK** Building System is recognised by many of the major building warranty providers such as LABC New Home Warranty, Premier guarantee & Zurich. It also holds TRADA and Gutesicherung Holzhausbau Certification and has ISO9001.



Streif UK brings STREIF's expertise of more than 75,000 homes and 77 years in producing sustainable building systems to the UK Market, utilising this experience to provide a professional approach to offsite manufactured buildings.

The accompanying specification demonstrates the quality of the Streif product along with its flexibility to adapt to UK designs and what makes our building systems special

Construction & Efficiency

- Improved thermal performance
- Excellent acoustic efficiency
- Weatherproof within 2 days
- Lower whole life costs
- Manufactured in quality controlled environment
- Zurich Insurance approved
- German Federal institutions monitor the use of quality-controlled materials.
- **Streif UK** undergoes both voluntary and statutory quality inspections. The production facility has the DIN EN ISO 9001:2000 certificate. In addition all prefabricated components of your **Streif UK** building bear the quality seal RAL-GZ 422/1.



Product Service

- Free Comprehensive Estimate
- Technical Advice
- System Design
- Product detail drawings for the system
- Structural Calculations (to German Standards)
- Health & Safety Documentation
- Transportation & Delivery
- Erection of System
- 35-year warranty for all structural bearing components of the building

Sustainable & Eco- Friendly

- Sustainable construction
- Less than 5% waste on all materials used
- Lower environmental impact
- Little use of water
- High energy efficiency
- Fewer site deliveries
- High energy conservation
- Air tight construction

Benefits

- Up to 50% faster build time
- Less site disruption
- Not weather dependant
- Improved site management & productivity
- Cost of snagging reduced by 60% due to factory controlled manufacture
- Speed of erection on site
- Guaranteed erection time
- Cost certainty
- Earlier return on investment
- High quality construction

Design

- The **Streif UK** Building System is flexible & adaptable to allow for individual design.
- The System is constructed at our manufacturing plant according to individual construction plans.
- The complete System is delivered to site & erected
- The **Streif UK** Building System creates the complete envelope of the building including all walls (load bearing and non-load bearing), roofs and intermediate floors.
- The **Streif UK** Building System can be erected on most flooring systems; however the foundations must be in accordance with the **Streif UK** Building System Technical Manual.

The Streif UK Building System

Uses

The **Streif UK** Building System can be used not only in housing but in flatted developments up to 4 storeys in height. A building guarantee e.g. 10 year warranty from LABC or Zurich Municipal can be provided but guidance from the various organisations offering the guarantee should be sought.

U-Values

The **Streif UK** Building System can achieve low U-values e.g. 0.17 W/m²K utilising the standard German Wall structure incorporating a service wall which means the System exceeds the current Building Regulations requirements.

Lower U-values can also be achieved with the **Streif UK** Building System by using additional insulation resulting in low running costs and great comfort for the lifetime of the building. Our system provides for a very air tight structure and it has low air changes per hour at normal air pressures with little opportunity for air leakage.

Cold Bridging

The **Streif UK** Building System also has less cold bridging and better thermal performance than traditional timber framed housing, this is where a material with a significantly worse thermal conductivity interrupts the normal continuous layer of insulation.

Sound

The **Streif UK** Building System is very robust and exceeds the minimum requirement of 45dB when testing for airborne sound by up to 40 -50% in most cases



KeraTür®
EXCLUSIVES ENTREE



Sondertür für England-Projekt

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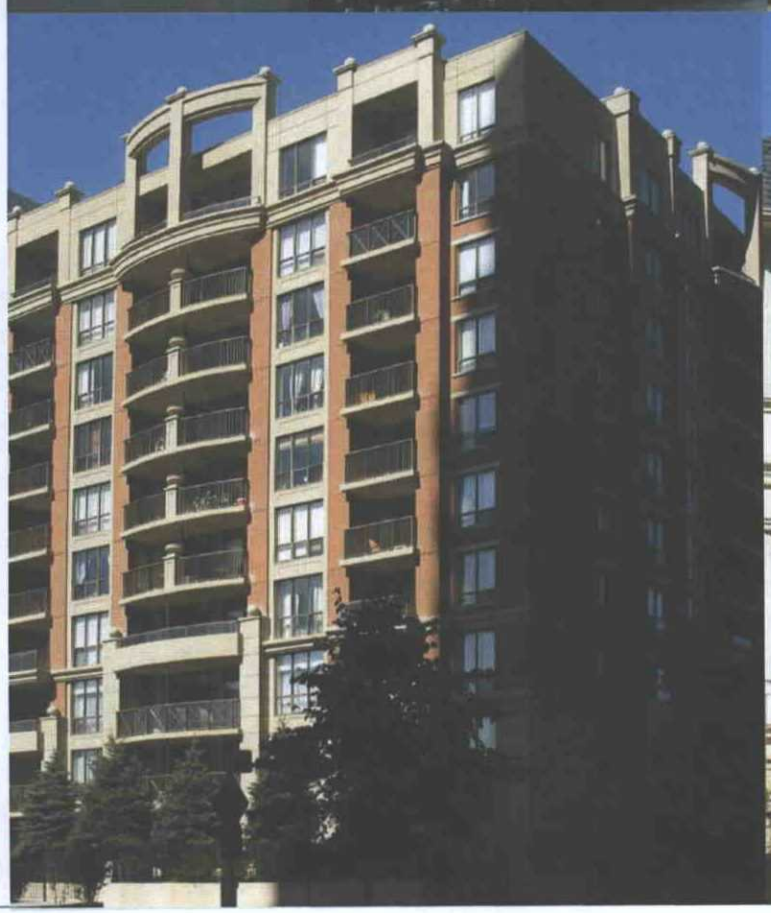




Products can be designed to specific requirements, alternatively visit www.springvale.com for product dimensions of stock items.

Uniclass
L6514:P91:P7111
C1/SfB Hy

February 2008



canamould

Architectural Features

springvale™
sustainable insulation values



Above: All the details here, including the mock Tudor effect, are in Canamould.

Left: Canamould details have a lightweight EPS core.

Site Work

Canamould products are delivered to site wrapped in packaging. Store products in a cool, dry place protected from direct sunlight, weather and other damage. Store all finishing and bonding materials at a temperature of not less than 4°C at all times.

Make COSHH safety data sheets for all materials available on site.

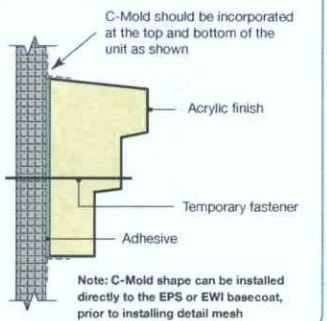
Installation Guide

Substrate must be dry and free of dust or any other 'bond breaking' materials. Canamould decorative features are intended for use over the primary exterior weather barrier (i.e. wall system) and are not designed for use in structural applications.

Refer to substrate manufacturer for specific recommendations.

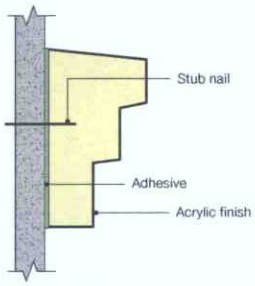
1. Measure size needed and saw through clean and smoothly.
2. Apply approved adhesive to back of Canamould feature using a notched trowel.
3. While adhesive is wet, immediately install Canamould feature and press into place. Remove excess adhesive before it dries.
4. Some pieces may require mechanical attachment until adhesive sets. Remove the temporary attachment prior to the finish coat.
5. Pieces can be joined using either a mitre or straight cut. Check alignment of joints for proper fit prior to embedding Cana-Mesh with approved basecoat over joints.
6. Prior to applying finish, ensure that:
   - All features are completely adhered and fully covered All temporary fasteners are removed
   - All joints have been treated and sanded flush
   - All Canamould surfaces are clean and free of dirt, dust and other contaminants.

Detail A – EWI

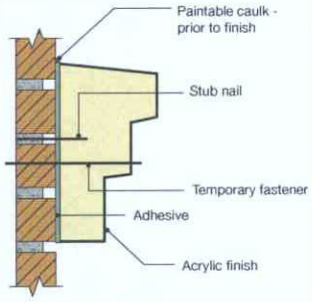


Note: C-Mold shape can be installed directly to the EPS or EWI basecoat, prior to installing detail mesh

Detail B – Masonry



Detail C – Render



nbsPlus

BSI
ISO 9001:2000
FM 13871

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CRH Insulation Europe

springvale™
sustainable insulation values

Superb Architectural Features

that take the weight out of detailing

Canamould is a range of superbly detailed, lightweight architectural features which act as an alternative to stone or cast stone detailing.

The moulded core is manufactured from expanded polystyrene (EPS) which is covered with a polymer-modified flexible cementitious coating creating features that are exceptionally lightweight, making installation a simple task and health and safety friendly. The installed details are waterproof, durable and unaffected by freeze-thaw cycles.

Canamould offers:

- external fascias/fenestration details
- replicates natural stone
- very lightweight
- easy to transport and install
- reduces build time
- perfect surface finish
- endless product range to suit your needs

Canamould can be used to create a broad range of domestic and commercial architectural features including window cills • capitals • window trims • bands • cornices • quoins • keystones • pilasters • columns • bases. A range of standard profiles is available or bespoke features can be made to your specific requirements.

The features are simply fixed into position using high-performance adhesives and, once fully bonded, will stay there maintenance-free for life.

Durability

Canamould products are dimensionally stable and resistant to attack from insects. Maintenance is minimal. Finished features are:

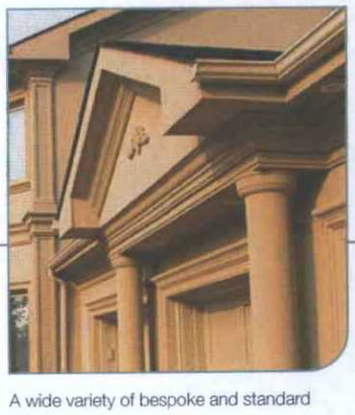
- unpenetrable by moisture
- unaffected by freeze-thaw cycles
- will not crack, swell, shrink, warp or peel
- extremely hard wearing
- unaffected by sun or UV light



Sharply detailed Canamould soffit and quoin details.



Canamould coping details and panelling.



A wide variety of bespoke and standard details.


HAUSGEROLSTEIN
STREIF
Ein Haus voller Leben.

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(Please tick the appropriate choice box in each section if applicable)

Project:
Client:

Schedule of Choices/Options

8 **Entrance Doors**

Timber entrance door, solid timber construction with a door leaf construction ☐
Glass Vision Panels - frosted glass ☐

Standard Door Styles:

H 1960 ☐



H900 ☐



H 2021 ☐



H1941 ☐



Optional Door Types at extra cost:

H 1925 ☐



H 1913 ☑



H 1960 ☐



H 1964 ☐



Standard Door Colours:
Surface : Lacquered Finish

- White RAL 9016 ☑
- Window Grey RAL 7040 ☐
- Coral Red RAL 3016 ☐
- Distance Blue RAL 5023 ☐
- Moss Green RAL 6005 ☐
- Crimson RAL 3004 ☐
- Blue Green RAL 6004 ☐
- Moss Green RAL 6005 ☐
- Steel Blue RAL 5011 ☐
- Anthracite Grey RAL 7016 ☐
- Light Grey RAL 7035 ☐

Optional Colours available at an extra cost:
Surface : Transparent

- Walnut ☐
- Red-Brown ☐
- Black-Brown ☐



Conservation entrance doorsets



Uses

Classically styled with distinctive mouldings that create the appearance and feel of traditional entrance doors. Fitted with a mobility threshold as standard, these doorsets are suitable for most new buildings and renovation projects.

Construction

Heavy 57mm thick door sections with solid wide rails and muntins to conservation ovolo or lambs tongue profiles. Panels are exterior grade 45mm thick composite insulated "warm" construction with a 'u' value 1.2 w/m2k featuring raised and fielded profiles both sides.

Operation

Factory hung doorset with key operated multi point locking system.

Glazing

Factory fitted double glazing where appropriate. Alternatively these lights can be left unglazed for customers to fit their own decorative glass panels after installation.

Note:
Door to be Painted
BLACK

Features

Material:
Hardwood frame, doors constructed in laminated knot free (clear graded) Larch or solid Douglas Fir at our option. Panels are exterior grade composite type.

Profile:
Square frame and ovolo door profiles

Cills:
Extruded aluminium mobility threshold strip mounted on a solid 144mm deep stained Hardwood sub cill

Frame:
68mm thick head and jambs

Operation:
Factory hung to open inwards, right hand hinge viewed from outside.
(Not available opening outwards)

Locking System
Multi-point, consisting of upper and lower claw bolts with a central mortice dead bolt and latch all key operated from both sides via double cylinder.

Bolt keepers are high security adjustable boxed version mounted into frame.

- Maximale Flexibilität durch individuelle Grundriss-Gestaltung
- KfW-Effizienzhaus 40 mit Wärmepumpen-Technik
- Individuelle Grundriss-Gestaltung möglich