



St James Group

12/00572/APPCON

**Blocks R, O3 and Private Housing, Phase 6
(Formerly Known as Phase 2)
Kennet Island
Reading**

Reading Borough Council

24 MAY 2012

Planning

Phase 6 Soft Landscaping and Landgas Mitigation Measures
Validation Report

May 2012

**READING BOROUGH COUNCIL
AMENDED PLAN**



REPORT CONTROL

Document: Block R, 03 and Private Housing, Phase 6 Soft Landscaping and Landgas Mitigation Measures Validation Report

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Project: Kennet Island, Reading

Client: St James Group

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V1	March 2012	Final	
V2	May 2012	Final with EHO comments	



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1 INTRODUCTION

1.1 BRIEF

This validation report has been prepared by WYG Environment (formerly White Young Green Environmental Ltd) on behalf of St James Group following completion of the 'Development' remediation works for Blocks R, O3 and Private housing which together form part of the Phase 6 site (formerly known as Phase 2). The Development remediation included the remediation of landscaped areas by Wooldridge Groundworks Contractors and the completion of land gas mitigation works by Wooldridge Contractors.

Validation reports have been produced to match the phasing of the construction, Phase 1, Phase 1A, Phase 1B and Phase 5 (formerly known as Phase 2HA) and two reports for Phase 6 (formerly known as Phase 2). The development blocks are shown on appended St James Site Plan Drawing Southside, Manor Farm-Phase 1A, 1B, 2HA & 6 (ref: 0022 rev Q). This report provides an overview of the landscaping remediation works and landgas mitigation works for part of Phase 6 for development blocks R, N3, O1-O3 and P1-P6. Factual information relating to the landscaping remediation works and the landgas mitigation works within this phase of development is appended. Information relating to the validation of previous phases of completed development (Phase 1, 1A, 1B, 5 and part of Phase 6) can be found in the following reports:

- Soft Landscaping and Landgas Validation Report on Blocks M, U1 and U2, Kennet Island, Reading (Phase 1), July 2008 (Ref REPORT/E03015-1/July08HB/VR/V1)
- Soft Landscaping and Landgas Validation Report on Blocks H and T, Kennet Island, Reading (Phase 1A) (Ref: REPORT/E03015-1/July08HB/VR1A/V1)
- Phase 1B Soft Landscaping and Landgas Mitigation Measures Validation Report (Ref: REPORT/E03015-3/HUP/Phs1BSftLVal/V1)
- Phase 5 Soft Landscaping and Landgas Mitigation Measures Validation Report (Ref: REPORT/E03015-5/HUP/Phs5SftLVal/V1)
- Phase 6 Soft Landscaping and Landgas Mitigation Measures Validation Report (Ref: REPORT/E03015-5/CC/Phs6SftLVal/V1)

It is understood that this report will be submitted by St James Group to the Environment Agency (EA), the Contaminated Land Officer at Reading Borough Council (RBC) and the National House Building Council



(NHBC). The purpose of this report is to confirm that the Development Works in the Remediation Strategy for the site, detailed in the WYG Remediation Strategy for Reading Sewage Treatment Works ref: E03015/PC/MAY05/RS-EASTSITE/V3, have been implemented at the Phase 6 site within the St. James Group Development Area of the former Reading Sewage Treatment Works. The Remediation Strategy was agreed with the EA and RBC.

WYG observed the Development Remediation Works on an occasional visiting basis. Therefore, much of the information contained herein has been supplied by the Contractor, who has confirmed that the works were carried out to the specification. WYG can take no responsibility for any inaccuracy of information supplied by the Contractor, upon which this validation report is based.

1.2 CONDITIONS

This report is prepared within the extent and limitations of the agreed brief detailed within the agreed schedule of services detailed in the WYG terms and conditions attached to our fee proposals (ref: HB28July08propV1) and attention is drawn to the report conditions shown in Appendix A.

1.3 PREVIOUS REPORTS

Documentation used in preparation of the Remediation Strategy and during remediation works included information from the investigations and reports detailed below. These are summarised in the Ground Conditions Assessment report ref: REPORT/E03015/CG/MAY04/GCA-EAST/V3.

Ground Investigations and Reports:

- VHE September 2004. Contamination testing.
- White Young Green Environmental / VHE August 2004. Contamination and Geotechnical testing.
- White Young Green Environmental Site Investigation Report, March 2004.
- White Young Green Environmental 2003. Contamination and geotechnical testing.
- Enviros/ Soil Mechanics/ Thames Water Utilities 2000. Geotechnical and Contamination testing.
- Thames Water 1999. Contamination Investigation.



- Wembley Laboratories 1977. Predominantly Geotechnical Investigation.

1.4 ROLES AND RESPONSIBILITIES

The Development remediation works team comprised the following:-

- Employer - St James.
- Principal Contractor - Wooldridge Construction Plc.
- Project Manager – St James.
- Environmental Consultant - WYG.

The landscape and landgas remediation works were supervised by the St James Group. The following personnel attended site in a supervisory capacity:-

- Alan Holt– Site Manager, St James Group.
- Kelvin Morrison, St James Group.
- John Roper, Wooldridge Group.

WYG representatives visited site to monitor the works progress on:

- 20th May 2009
- 20th August 2010
- 7th September 2010
- 9th March 2011
- 4th October 2011

1.5 SITE DESCRIPTION

The St James Development Area (referred to as the 'Development Area' throughout this report), is approximately 6.75ha in area, lies within the centre of a larger redevelopment site known as the former Reading Sewage Treatment Works, Manor Farm, or Kennet Island (referred to as the 'Development Site' throughout this report) as illustrated on WYG sketch E003015-1 SK2001. Part 2 of Phase 6 forms a part of the Development Area.



The Development Site, approximately 27ha in size, is bound by to the south by Commercial Road. The western boundary is defined in part by Island Road and further north by Foudry Brook. The northern boundary is defined in part by the River Kennet. The remainder of the northern boundary dog-legs in a south easterly direction. The eastern boundary is defined by an access road and the adjacent plots boundary.

The development site is centred on approximate National Grid Reference 471249, 170572 approximately 2km south of Reading town centre. The development site location is shown on the attached WYG Drawing No. SK.2001 and the development area position within the larger Development Site is shown in outline in this drawing and in greater detail on St James Group Ltd Drawing No 0022revQ (appended).

1.6 GEOLOGY, HYDROGEOLOGY AND HYDROLOGY

Geology

Several phases of intrusive Site Investigation were undertaken across the wider Development Site, prior to the Enabling Works remediation, which was completed in 2006. Made Ground was encountered to a maximum depth of 8.0m bgl beneath which sporadic river deposits were encountered (absent in the east) which were in turn, underlain by the solid geology of the London Clay, where present. The Lambeth Group was encountered beneath the London Clay, where present and directly beneath the Valley Gravels in the west of the site where the London Clay was absent, with the White Chalk at depth.

Hydrogeology

The north west of the Development Site overlies a Secondary Aquifer (associated with the Valley Gravels) and the south east of the Development Site lies over non-productive strata (the London Clay). Beneath which, the White Chalk is classified as a Principal Aquifer. Site investigation indicates the shallow groundwater has a flow towards Foudry Brook and the River Kennet, generally north westerly.

Hydrology

The River Kennet, classified by the EA as Grade A quality or 'Very Good', flows west to east adjacent to the northernmost tip of the Development Site.



Foudry Brook, classified as Grade B or 'Good' by the EA flows from south to north adjacent to the western boundary of the Development Site.

1.7 CUREERENT SITE STATUS

Construction of Phase 6 of the development area has been completed and Part 2, to which this report pertains, comprises the following:

- Block N3 – Two/ three storey terraced town houses with private gardens and managed soft landscaping.
- Block O1-O3 – Two/ three storey terraced town houses with private gardens and managed soft landscaping.
- Block P - Two/ three storey terraced town houses with private gardens and apartment buildings with managed soft landscaping.
- Block R – Three/ Four storey apartment buildings with managed landscaping

The development blocks have been annotated on WYG sketch E003015-5 SK305. The individual units and associated infrastructure such as parking and access route are illustrated on St James Group appended sketch ref: 0022/revQ.



2 REMEDIATION

2.1 SUMMARY OF OUTLINE REMEDIATION STRATEGY

The remediation of the site has been undertaken in two parts. The Enabling Works remediation was completed in March 2006 and is reported in the WYGE Validation Overview Report for the Demolition, Remediation and Earthworks ref: E03015/PC/APR06/VR/V1.

The Development Works remediation is that which is reported in this document and comprised the installation of a cover layer in garden and landscaping areas and the installation of land gas protection measures to buildings.

The aim of the Remediation Strategy was to appropriately reduce, control and manage significant risks to the environment and human health by remediating historic contaminants at the site and thus facilitating beneficial use for residential and commercial development.

The Remediation Strategy was agreed with the Environment Agency and the Environmental Health Officer at Reading Borough Council prior to the commencement of works and any subsequent alterations are fully agreed and documented. The relevant correspondence may be found in Appendix B.

The EA and the Contaminated Land Officer were kept informed of the works and were forwarded landgas monitoring information.

Remediation During the Enabling Works

The first phase of remediation during the Enabling Works was undertaken to appropriately mitigate the risk of contamination to the groundwater in the chalk aquifer beneath the site and to Foudry Brook and the River Kennet.

The main elements of the Enabling Works remediation are as follows:-

- The remediation of sewage sludge
- The remediation of landfill material forming the infill to a former sludge lagoon



- The stockpiling of soil passing the Human Health criteria for use as a cover layer in landscaped areas and gardens.
- Landgas and groundwater monitoring

The landgas monitoring undertaken during the Enabling works was reported within the Enabling Works Validation Report. Extracts of which relating to landgas (section 9.4 and section 10.6) have been reproduced below for ease of reference. These indicate that:

"The majority of the boreholes monitored did not exhibit any significantly elevated levels of land gases (generally considered to 1% or more methane by volume or 5% or more carbon dioxide). Significantly elevated levels were generally concentrated in the area of which comprised landfill prior to the remediation works, in the north eastern corner of the site. The Gillette site is situated adjacent to the site boundary at this location and is known to be built upon an historic landfill. Significantly elevated land gas levels were also monitored at LG401 in the south western corner of the site whilst occasional elevations were monitored on the western boundary."

"In order to determine the land gas requirements for buildings to be constructed at the site, further monitoring of the existing boreholes will be required and it is recommended that a programme of monitoring is agreed with the EHO. Subsequently, footprint specific monitoring may also be needed but this will largely be dependent upon the result of ongoing monitoring of the existing boreholes. Ultimately, it is likely that land gas protection measures will be required for some of the buildings to be constructed on the site. At this stage it is not anticipated that active venting will be required for any buildings but passive ventilation may be needed for some buildings, depending upon the results of further monitoring."

Landgas Monitoring Prior to Commencing the Development Works

A six month period of further landgas monitoring was undertaken from May 2006- October 2006. A letter report (ref: pg28Feb07) was written to determine the baseline landgas conditions. This has been included within Appendix C.

The installation of a 2000g Damp Proof Membrane which is lapped, taped and sealed around all penetrations was suggested within letter report dated 25th September 2008 (ref:HB25Sept08 LandgasPhs2V1) and agreed by Reading Council in letter dated 30th Jan 2009 (included within Appendix B).



Remediation During the Development Works

Remediation during the Development Works comprised the following:-

- The installation of a cover layer of site derived soil which passes the Human Health criteria (as given within the agreed remediation strategy and reproduced within section 3 of this report) over the formation level in landscaping areas.
- The installation of land gas protection measures to buildings, as required.



3.0 DEVELOPMENT REMEDIATION WORKS

3.1 SUMMARY OF DEVELOPMENT REMEDIATION WORKS

Several site investigations have been undertaken on the subject site as a whole from 1977 to date. Utilising this information WYGE prepared a Remediation Strategy (ref: E03015/PC/MAY05/RS-EASTSITE/V3), which outlined the method and approach to be followed regarding the landscaping areas.

The specification to which the remediation of the landscaped areas was undertaken is detailed within the design requirements and standards documents for the residential Phases 1 and 1A (Ref: REPORT/E03015/HB/AUG06/VALRPT REQUIREMENTS/V1). Phase 6 was undertaken to the same specification.

In relation to the landscaping to which this document relates, remediation involved the installation of a cover layer of site derived soil which passes the Human Health criteria over the formation level in landscaping areas. Imported topsoil was lain over the site derived soils and the chemical test results are included in Appendix G.

The mitigation of risks to Human Health from land gas generated on site involved the installation of a 2000 gauge Damp Proof Membrane across the footprint of the buildings of Blocks R, N3, O1-O3 and P1-P6. Joints and penetrations were lapped, taped and sealed.

The remediation works described in this validation report were undertaken by the St. James Group between May 2004 and August 2006. Following initial preparatory works, the gas mitigation membranes were laid between mid 2009 and the end of 2010 and the external soft landscaping cover layer was laid from 2009 on a Block by Block basis until completion in February 2012.

The site has been split into several redevelopment blocks, scheduled into several phases of works. This report specifically addresses the validation of soft landscaping and landgas mitigation measures for part two of Phase 6.

3.2 SCOPE OF DEVELOPMENT REMEDIATION WORKS

The objectives of the Development Remediation Works were to achieve an appropriately reduced level of risk to facilitate occupation of the development. The works were carried out to practically minimise the site risks in line with UK guidelines and to the reasonable requirements of Statutory Authorities, developers and funds.

The remediation methodology was compiled and agreed with referenced parties (particularly RBC) such that appropriate works were undertaken and validated.

The Development Remediation Works were carried out following the WYGE Landscaping Validation Requirements Document ref: E03015/HB/AUG06/VAL RPT REQUIREMENTS /V1 and progress was monitored by WYG on the basis of occasional site visits. The dates of these site visits are listed in section 1.9.

The site is being redeveloped into a residential use area, including areas of managed soft landscaping and private gardens.

The landscaping remediation works specification consisted of the following: -

- A minimum thickness of 200mm cover layer of soil passing the Human Health Criteria (Table 3.1) or appropriate growth medium over areas of managed landscaping and local deepening for tree pits.
- Site derived material tested at a frequency of 1 per 600m³. Material for re-use in landscaping and domestic gardens to pass the criteria for Human Health, (Table 3.1)
- Imported materials analysis at a rate of 1 per 600m³, unless certified by others. Imported material for use in landscaping and domestic garden areas to pass criteria of (Table 3.2).
- The land gas protection measures for Blocks N3, O1-O3, R and P1-P6 were the same and comprised the laying of an upgraded Damp Proof Membrane (2000 gauge Visqueen membrane) with all joints and penetrations lapped, taped and sealed.

3.3 REMEDIATION CRITERIA

The Human Health Criteria are given in Table 3.1. Site derived material used in areas of managed landscaping and domestic garden was required to pass these criteria.

Table 3.1 Human Health Criteria Chemical Limits for Material Re-Use in Managed Landscaping Areas and Domestic Gardens

DETERMINAND	MINIMUM ACCEPTABLE VALUE (mg/kg)
Arsenic	20
Chromium	130
Cadmium	8
Mercury	8
Nickel	50
Benzo(a)pyrene	1
Ammonia as N	200

The Import Criteria are given in Table 3.2. Imported material used in areas of managed landscaping and domestic gardens was required to pass these criteria.

Table 3.2 Import Criteria Chemical Limits for Material Use in Managed Landscaping Areas and Domestic Gardens

DETERMINAND	MINIMUM ACCEPTABLE VALUE (mg/kg)
Arsenic	20
Chromium	130
Cadmium	5
Mercury	5
Nickel	50
Benzo(a)pyrene	1
Ammonia as N	200
Copper	300
Zinc	600
Total Petroleum Hydrocarbons	50
Asbestos	None visible

3.4 METHOD STATEMENTS

Method Statements in respect of laying the polythene (Visqueen) membrane and specification of landgas measures are included within Appendix D.

WYG were provided with imported topsoil test data, supplied by the Contractor, Wooldridge. WYG did not have a continuous presence on site when the topsoil was lain but undertook periodic site visits (see section 1.4) to inspect the soft landscaping works and landgas membrane laying.

3.5 SOFT LANDSCAPING AND COVER LAYER SOIL TESTING

The soft landscaping cover layer comprised material meeting the Human Health Criteria derived from earthworks activities across the Development Site and imported topsoil.

Managed Soft Landscaping in areas of Residential Development

In managed landscaping areas, a cover layer of imported topsoil passing the Human Health Criteria was placed over the formation level. The cover layer comprises 200mm in thickness, locally deepened for tree pits, as required by the landscape architect. Planting plans are included in Appendix E.

Soft Landscaping in Domestic Garden Areas

In areas of residential development with private gardens i.e. areas with future site users with private gardens which could potentially be used for vegetable growth, the cover layer comprises 450mm of soil passing the Human Health Criteria (see table 3.2 above), overlain by 150mm of imported topsoil passing the Human Health and Import criteria. Photographs in Appendix E illustrate the thickness of imported cover soil.

The site derived material was stockpiled on site and tested to demonstrate its chemical suitability, see Section 3.2. The imported topsoil was bought in bulk by St James in 2006. This stockpile has been stored undercover in a shed area of Mimbridge Garden Centre, Station Road, Chobham, Surrey. The topsoil was delivered to site in covered 20 tonne haulage lorries as and when it was required on site.

Reference to the attached Drawing No. VHE/419/VR009, indicates that the entire formation level in the Development Area for Phase 5 already met the Human Health Criteria. Therefore, the requirement was that the cover layer also met the Human Health Criteria but that its thickness was essentially immaterial.



3.6 VALIDATION TESTING

In order to demonstrate that the re-use cover layer material met the Human Health Criteria, 17no. validation samples were taken by WYG from the stockpile (approximately 10,000m³) of soils for re-use on site in July 2006.

The samples were dispatched to the testing laboratory where analysis for asbestos presence/absence, benzo(a)pyrene, Arsenic, Cadmium, Chromium (total), Mercury, Nickel and Ammonia. The results of the testing may be found in Appendix F.

All the soil testing and issuing of results for the works was completed at the following UKAS accredited laboratory: -

I2 Analytical Ltd
Brunel Science Park
Uxbridge
Middlesex
UB8 3PQ

The soil results all passed the Human Health Criteria given in Table No. 3.1.

One sample of the Topsoil was initially tested at Mimbridge Garden Centre upon purchase in 2006 and the results are appended. A further test was undertaken on a load imported to site in 2008, one in 2009 and another on a load imported in 2010. The results are included within Appendix G. A slight exceedance of Benzo(a) Pyrene (1.5mg/kg) was identified in the initial test of the stockpile at Mimbridge Garden centre in 2006, but the testing on the imported loads illustrated Benzo(a) Pyrene below the TSV. Further investigation of this isolated slight exceedance was not considered necessary since the material which was actually imported to site passed the Human Health and Import Criteria.

3.7 LANDGAS MEMBRANE

The baseline gas regime of the Development Site was set out within letter report dated 28th February 2007 (ref: pg28Feb07). The installation of a 2000g Damp Proof Membrane which is lapped, taped and sealed around all penetrations was recommended within letter report dated 25th September 2008 (ref:HB25Sept08 LandgasPhs2V1) and agreed by Reading Council in letter dated 30th Jan 2009 (included within Appendix B).

The recommendation was based on six months of landgas monitoring in the vicinity of Phase 2 development. The table below shows the maximum concentrations recorded within the vicinity of Phase 2 during the six month monitoring period.

Table 3.7 Maximum Landgas Concentrations recorded between May 2006 and October 2006

Borehole Loc	LG403	LG402	LG1002	BH7G
CO ₂ Max (%)	3.4	4.5	4.2	1.0
CH ₄ Max (%)	0.0	0.0	0.0	0.0
Flow Max (L/hr)	2.3	1.5	0.0	13.3

Borehole locations can be seen on appended sketch SK154.

The full landgas monitoring data is included within Appendix C. The Phase 2 development is approximately 300m further south of the beginning of the elevated methane zone measured in the north of the site (see SK154 appended). During the six month monitoring period methane concentrations were not recorded above the limit of detection.

Assessing the data in the table above based on CIRIA 665 guidance, a worst case Gas Screening Value (GSV) for CO₂ is:

Worst case gas concentration x worst case flow = Gas Screening Value (L/hr)

0.045 x 13.3 = 0.5985 L/hr

A GSV of 0.5985 L/hr is comparable to Characteristic Situation 2 or Low risk as per table 8.6 of CIRIA 665 'Assessing Risks Posed by Hazardous Ground Gases to Buildings'. The typical scope of protective measures is considered to be a.) Reinforced concrete cast *in situ* floor slab (suspended, non suspended or raft) with at least 1200g DPM and underfloor venting, or b.) Beam and block or pre-cast concrete and 2000 g DPM/ reinforced gas membrane and underfloor venting. All joints and penetrations sealed.

A 2000 gauge Visqueen Damp Proof Membrane was laid to appropriately mitigate the risk of land gas ingress into the blocks making up Phase 6. Joints and penetrations were lapped, taped and sealed. The installation was observed during occasional site visits by a WYG engineer and confirmed as laid in



accordance with the agreed specification. Not all of the membrane was visible but was confirmed as laid to the specification by the Contractor.

The membranes were laid by Wooldridge Contractors and a method statement from St James Group is presented within Appendix H. Photographs from WYG inspections are included within Appendix H and photographs provided by Wooldridge Contractor are provided in Appendix I.

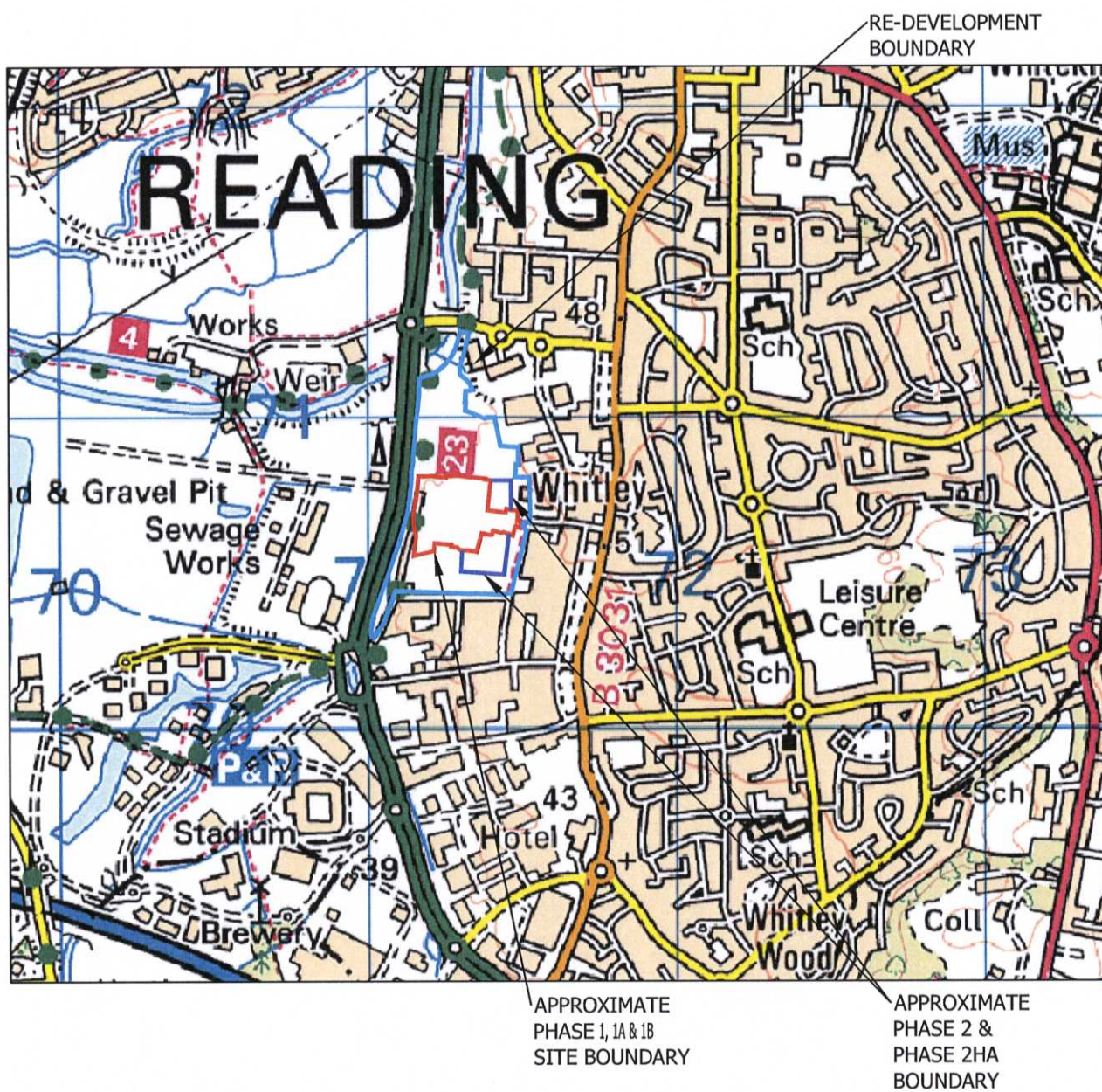


4.0 CLOSING RECORDS

No further gas monitoring was recommended for Phase 2 of the development works. This report will be submitted to the Client for issue to the Contaminated Land Officer at Reading Borough Council, the Environment Agency and the NHBC for comment and record purposes.



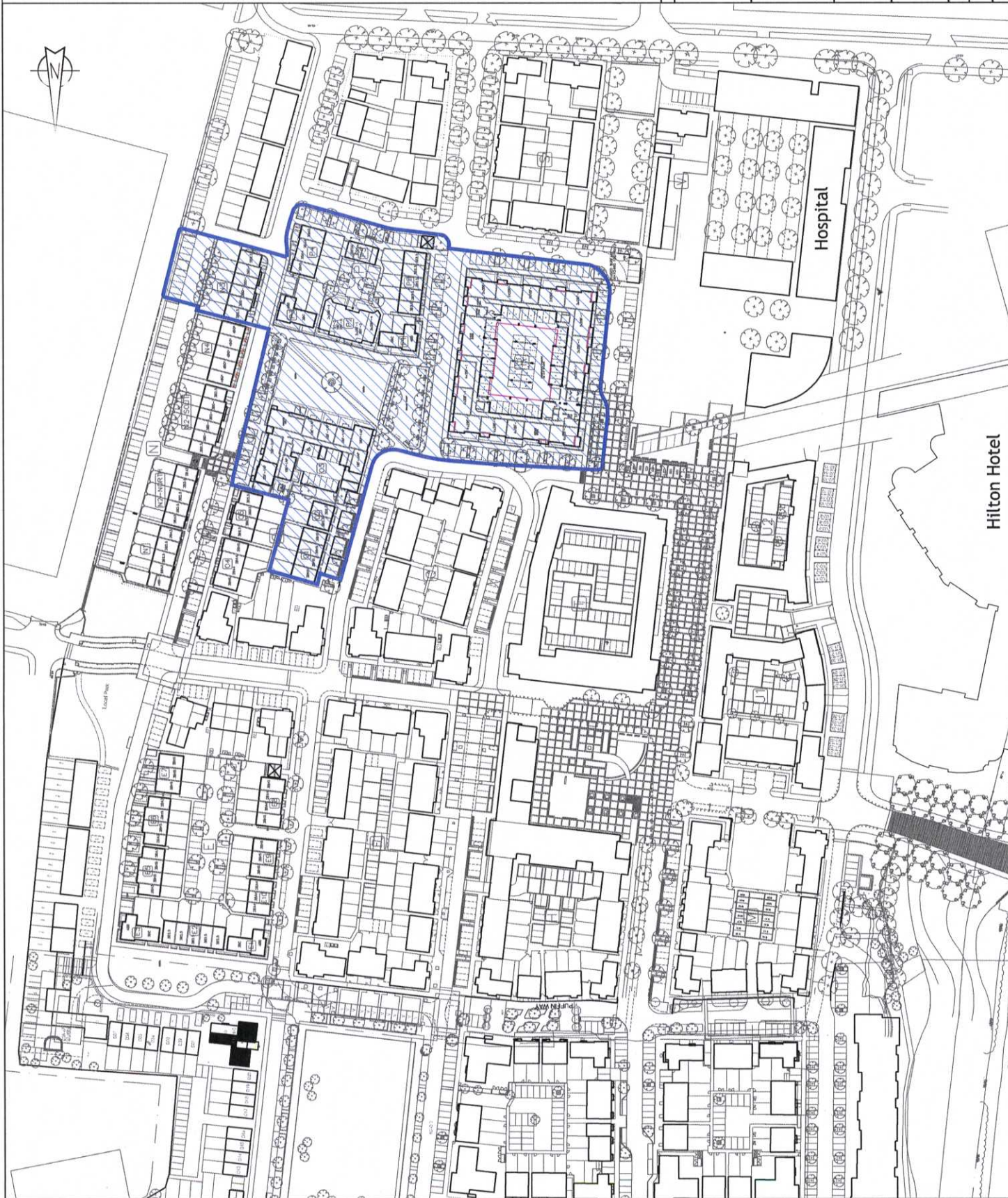
FIGURES



WYG Group Ltd

KEY:

- Part 2 Phase 6
Formerly Phase 2 Boundary



REV	DESCRIPTION	BY	CHK	APP	DATE
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CLIENT:
ST JAMES GROUP

100 ST JOHN STREET
LONDON
EC1M 4EH

TEL: +44 (0)20 7250 7200
FAX: +44 (0)20 7250 7201

Project:
READING EAST SITE
LANDSCAPE VALIDATION



Drawn by: TJB
PART 2 PHASE 6 BOUNDARY & DEVELOPMENT SITE
LAYOUT PLAN

Scale @	A3	Drawn	Date	Checked	Date	Approved	Date
Project	E03015-5	40	ENV	SK.305			

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Any discrepancies between this drawing and other information should be
referred to the relevant information.
MAGNETIC MEDIA, AND MAY
ONLY BE CARRIED OUT BY St James Group.

REV	DATE	DESCRIPTION	BY	CHK
K	07.04.10	Phase 3 Parking Bays Amended	EH	
L	22.04.10	Phase 3 Block 4 Parking Bays Reamended	EH	
M	22.04.10	Phase 3 Block 4 Parking Bays Amended	EH	
N	29.04.10	Phase 4 Block 03 All Amended	EH	
O	11.05.10	Parking Bays Changed To Visitor Spaces	EH	
P	24.06.10	Phase 5 Visitor Parking Amended	EH	
Q	19.10.10	Phase 6 Block P Parking Numbers Amended	EH	

KEY

Extent Of Plot Demise
Plot Boundary Ownership
Extent Of Site Boundary
Communal Access

Bin Store / Cycle Store

Block T Right To Use Bin Store

Unadopted Pedestrian / Vehicle Access

Block T Pedestrian Right To Access

Cycle Store

Refuse Bin Collection Point

Apartment Block Communal Refuse Bin

Shed

Block M Allocated car parking spaces

Block H Allocated car parking spaces

Block T Allocated car parking spaces

Block U1 Allocated car parking spaces (Phase)

Extent Of Block U1 & U2 Housing Association Demise (Affordable)

Block E Allocated car parking spaces

Block F Allocated car parking spaces

Block O Allocated car parking spaces

Block Q Allocated car parking spaces

Visitor Car Parking

New Carriageway

Permeable Parking Bays

Footways

Footpath/Cycleway Vehicle Crossover

Car Club parking bays

Block H Allocated car parking spaces

Block O Allocated car parking spaces

Block P Allocated car parking spaces

Block F Allocated car parking spaces

Block H Allocated car parking spaces

Sewer Easement

St JAMES

St. James House, Manor Farm Road, Reading, Berkshire RG2 0JH
Telephone: 0118 987 9000 Facsimile: 0118 987 9040
www.stjameshomes.co.uk

Project Name: SOUTHIDE, MANOR FARM - PHASE 1A, 1B, 2HA & 6

Drawing Title: Whole Site Combined Conveyance Plan

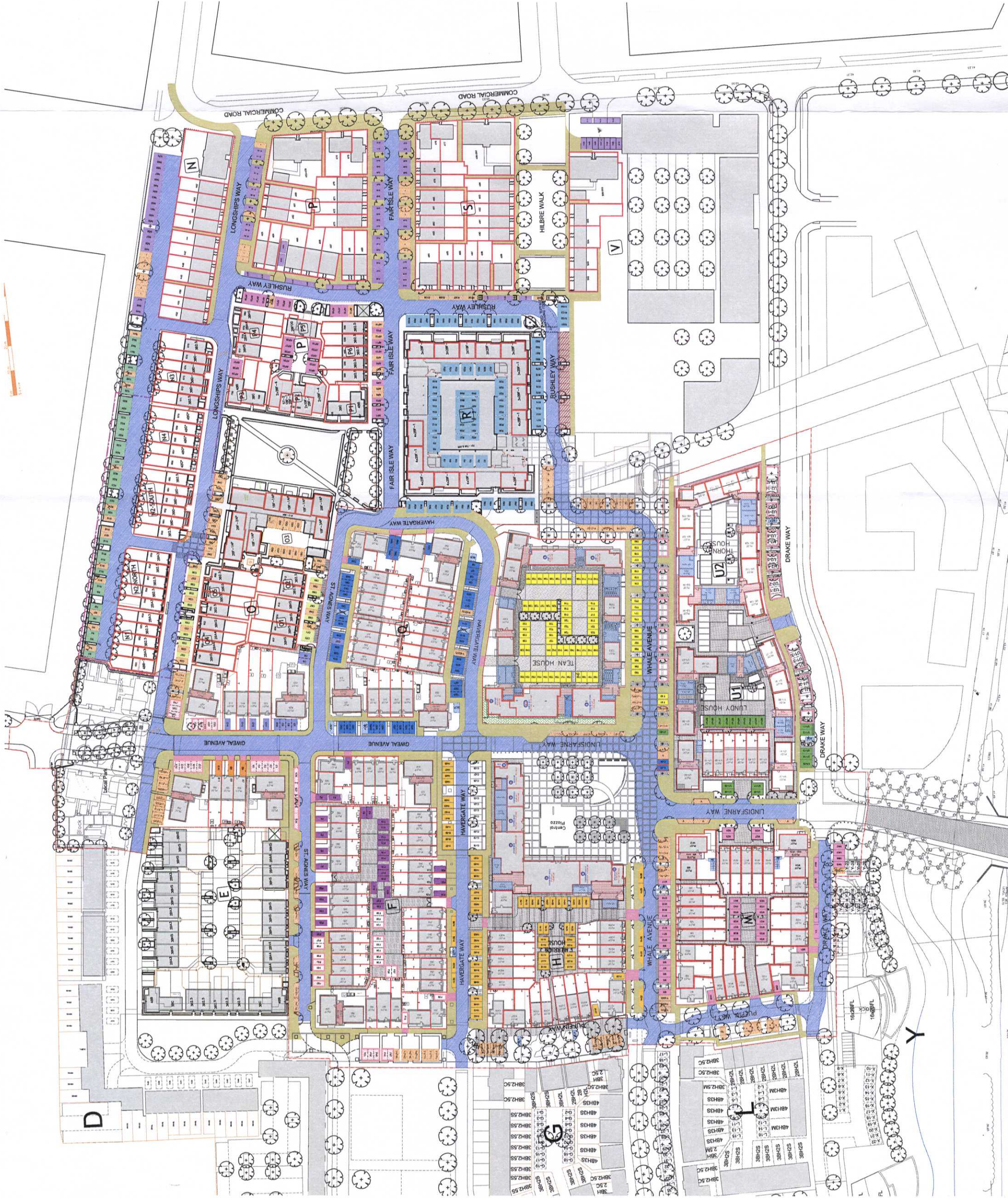
Project No: D603

Revision: Q

Author: D603

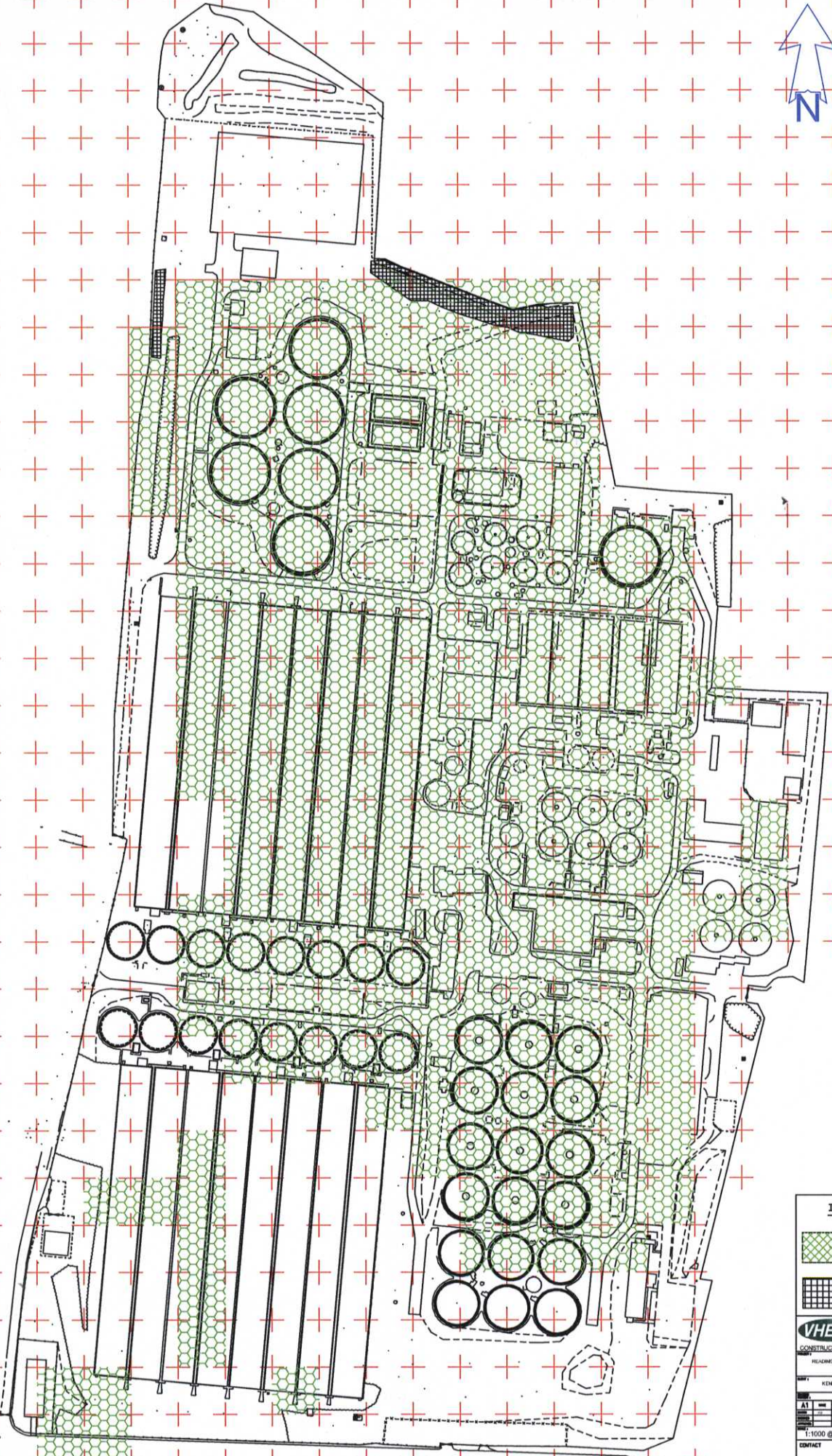
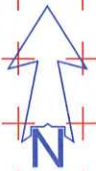
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Reviewed: EH



A B C D E F G H I J K L M N O P Q R S T

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LEGEND

 MATERIAL IN UPPER 6.0m BELOW FORMATION LEVEL FAILING THE HUMAN HEALTH CRITERIA

 MATERIAL IN UPPER 6.0m BELOW FORMATION LEVEL FAILING THE HUMAN HEALTH CRITERIA

VHE
CONSTRUCTION P.L.C.

REDAKING STW

KENNET PROPERTIES

AT **1:1000 @ A1**

CONTACT



Appendix A

Report Conditions

WYG ENVIRONMENT PLANNING TRANSPORT LTD

Blocks R, 03 and Private Housing (Formerly known as Phase2), Kennet Island, Reading

This report is produced solely for the benefit of St. James and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to WYG. In time improved practices, fresh information or amended legislation may necessitate a re-assessment. Opinions and information provided in this report are on the basis of WYG using due skill and care in the preparation of the report.

This report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times.

This report is limited to those aspects reported on, within the scope and limits agreed with the client under our appointment. It is necessarily restricted and no liability is accepted for any other aspect. It is based on the information sources indicated in the report. Some of the opinions are based on unconfirmed data and information and are presented as the best obtained within the scope for this report.

Reliance has been placed on the documents and information supplied to WYG by others but no independent verification of these has been made and no warranty is given on them. No liability is accepted or warranty given in relation to the performance, reliability, standing etc of any products, services, organisations or companies referred to in this report.

Whilst skill and care have been used, no investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather related conditions.

Although care is taken to select monitoring and survey periods that are typical of the environmental conditions being measured, within the overall reporting programme constraints, measured conditions may not be fully representative of the actual conditions. Any predictive or modelling work, undertaken as part of the commission will be subject to limitations including the representativeness of data used by the model and the assumptions inherent within the approach used. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions.

The potential influence of our assessment and report on other aspects of any development or future planning requires evaluation by other involved parties.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors

November 2008
WYG Environment Planning Transport Ltd



Appendix B

Statutory Correspondence

Our Ref:

28th February 2007

Mr. D. Goel
Kennet Properties Ltd.
Clearwater Court
Vastern Road
Reading
RG1 8DB

Environmental

Environmental
Consultancy
Environmental
Management
Geotechnical
Engineering
Ground Investigations
Health & Safety

Dear Dipak,

Re: Reading STW – Report on Six Month Period of Land Gas Monitoring

Introduction

WYGE were commissioned by Huw Griffiths of Kennet Properties Ltd. to undertake a six month period of land gas monitoring of existing boreholes at the above site following completion of the remediation works.

The monitoring has been undertaken on boreholes situated largely around the perimeter of the site and outside of the area occupied by the St. James Group, as identified on the attached Drawing No. SK154. Through the central part of the site for which ownership has been transferred to the St. James Group, land gas protection measures are being determined directly for them through a separate appointment.

Previous ground gas monitoring reported elevated concentrations of methane and carbon dioxide in the northeastern and southwestern parts of the site, respectively. Landfill sites are located adjacent to both the northeastern (Gillette site) and western (Reading Southside) site boundaries and may be a potential source of land gases.

The six month period of monitoring was undertaken to obtain further information particularly with respect to :

- Intermittently elevated levels of methane in the north east corner of the STW at the location of the former sludge lagoon and former landfill area.
- Elevated levels of carbon dioxide on several occasions in the south western corner of the site at Borehole LG401.

The information is required in order to determine the requirement for any land gas protection measures for any buildings which are proposed in the future for these areas. It is currently understood that these areas remain under the ownership of Kennet Properties Ltd but are likely to be sold for development in the future. The information is also required by the Contaminated Land Officer at Reading Borough Council (see attached letter dated 5th June 2006).

All serviceable land gas boreholes (18 No.), largely located adjacent to the site boundaries, were monitored on a monthly basis over a six month period, during atmospheric pressures ranging from 987mbar to 1016m bar.

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Offices throughout the UK and overseas

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Results

The results of the land gas monitoring undertaken during the six month period and during the Enabling Works Remediation (reported in full in the Enabling Works Validation report ref: E3015/PC/APR06/VR/V1) are summarised on the attached Drawing No. SK153. This drawing shows those land gas levels above which further consideration should be given to the use of land gas protection measures (detectable methane and carbon dioxide levels of 5% by volume or greater).

The first round of monitoring was undertaken in May 2006. The monitoring reported 2.4%vol of methane in BH701, in the northeastern part of the site. All other boreholes monitored reported no concentrations of methane. The maximum carbon dioxide concentration was reported at 3.3%vol in LG404. Oxygen levels ranged from 4.6%vol in BH701 to 21.0%vol in LG402. Flow rates were all zero, with the exception of LG409, which reported a flow rate of 0.1 l/hr.

The second round of monitoring, undertaken in June 2006, reported levels of methane in BH701 (9.0%vol), LG409 (0.8%vol) and BH702 (1.6%vol). All other boreholes monitored reported no methane. LG401 and LG404 reported concentrations of carbon dioxide at concentrations of 10.2%vol and 7.4%vol, respectively. All other boreholes monitored reported carbon dioxide levels ranging from 0 to 3.6%vol. Oxygen concentrations ranged from 1.0%vol in BH701 and BH702, and 21.0%vol in LG403. Flow rates were zero for all boreholes monitored.

During the third round of monitoring in July 2006, elevated methane was detected in LG404 (1.6%vol), LG506 (0.1%vol) and LG701 (5.6%vol). All other monitored boreholes identified no methane. A carbon dioxide concentration of 8.6%vol was identified in LG401. All other boreholes monitored reported carbon dioxide levels ranging from 0 to 2.5%vol. Oxygen concentrations ranged from 1.8%vol in LG702 to 20.3%vol in LG409. Flow rates ranged from -6.1 l/hr to -5.5 l/hr.

The fourth monitoring round, undertaken in August 2006, identified methane in BH701 and BH702 at concentrations of 2.3%vol and 0.7%vol, respectively. All other boreholes reported no methane. Levels of carbon dioxide were identified in LG404 and LG405 at concentrations of 7.8%vol and 7.3%vol, respectively. The remaining boreholes recorded carbon dioxide concentrations ranging from 0 to 4.2%vol. Oxygen concentrations ranged from 1.4%vol in BH702 to 20.2%vol in BH404a. Flow rates were zero in all boreholes with the exception of BH506, which reported a flow rate of 0.2 l/hr.

Methane was identified in BH701 (0.2%vol) and BH702 (2.1%vol) during the fifth monitoring round, undertaken in September 2006. Methane was not identified in any of the other boreholes monitored. Carbon dioxide was identified at below 5% in all boreholes monitored, the maximum concentration of 3.2%vol recorded in LG401 and LG402. Oxygen levels ranged from 1.9%vol in BH702 to 20.5%vol, in multiple boreholes. Flow rates were all zero, with the exception of LG401 and BH405, which reported 0.2l/hr and 0.1l/hr, respectively.

The sixth monitoring round, undertaken in October 2006, recorded elevated methane in BH507, BH701 and BH702 at concentrations of 6.4%vol, 0.8%vol and 8.3%vol. All other boreholes monitored recorded no methane. Carbon dioxide was significantly elevated in LG409 with a concentration of 18.3%vol. All other boreholes reported carbon dioxide concentrations ranging from 0 to 3.0%vol. Oxygen concentrations ranged from 0.6%vol in BH702 to 20.2%vol in BH506. All flow rates were zero, with the exception of BH702, which recorded a flow rate of -2.4l/hr.

Summary of Results

In summary:-

- Elevated concentrations of both methane and carbon dioxide were consistently detected in BH701 and BH702, in the northeastern site area, with a maximum of 9.0%vol methane being detected in BH702. Additionally, oxygen levels in these boreholes were consistently low.

- BH507, also in the northeastern part of the site, adjacent to BH702, detected an elevated concentration of methane during the sixth monitoring round and low concentrations of carbon dioxide during two earlier rounds.
- LG409, also in the northeastern site area, has reported elevated carbon dioxide concentrations, but shows inconsistencies between monitoring rounds. A maximum concentration of 18.3%vol carbon dioxide was detected in this borehole during the sixth monitoring round, however, in a number of previous monitoring rounds, no carbon dioxide was detected.
- LG404, adjacent to the western site boundary, recorded significant levels of both methane and carbon dioxide, although somewhat inconsistently. Oxygen levels were also inconsistent, ranging from 10.7%vol to 20.2%vol throughout the monitoring period.
- LG401 and LG405 reported elevated concentrations of carbon dioxide, although inconsistent throughout the monitoring period.
- Flow rates were consistently low throughout the monitoring period in all boreholes.

Conclusions

Flow rates were generally zero or close to zero across the site, suggesting that the production rate of the land gases is not significant and that there is currently no land gas being generated at the site itself.

Boreholes in the north eastern site area reported both methane and carbon dioxide at significantly elevated concentrations. These elevated levels are adjacent to an area of landfill located adjacent to the north eastern site boundary. Some organic Alluvium is also present beneath the Made Ground in the northern part of the STW and residual gases from this may be a contributing factor to the measured levels of land gas.

Boreholes along the western site boundary detected significant concentrations of carbon dioxide and methane (though lower than in the north east of the site). Land gas concentrations were inconsistent, elevated only during some monitoring rounds. The elevated concentrations may be attributable to the presence of the landfill at Reading Southside, to the west of the A33.

Recommendations

Recommendations at this stage can be only general in nature since the footprints and nature of the development across much of the site is currently unknown. In general, it is understood that development in the north is likely to be residential and may comprise traditional housing or apartment whilst in the south west, commercial development is anticipated. Following confirmation of building footprints and building types, consideration should be given to the potential need for land gas protection measures and reference made to the current UK guidelines in CIRIA report C659 (2006) 'Assessing risks posed by hazardous ground gases to buildings'. Footprint specific monitoring may be required at some locations for confirmation of land gas levels, particularly in areas where monitoring has been limited to date.

At this stage, it is considered that land gas protection measures will be required for any buildings constructed in the north of the site close to the adjacent landfill and where the Made Ground is underlain by Alluvium. In the north eastern part of this area, as shown coloured orange on Drawing SK154, where significantly elevated levels of methane have been measured, as a minimum it is anticipated that a passively vented underslab void and a gas barrier containing a foil insert such as the Visqueen Gas Barrier, will be required. Due to the low flow rates measured it is considered that the need for active (e.g. fan operated) measures are unlikely to be required. In the remainder of the north of the site, as shown in pink on Drawing No. SK154, the aforementioned gas barrier and passive underslab void could be installed, but if footprint specific monitoring can be undertaken, it may be possible for the level of protection to be reduced to an upgraded damp proof membrane (e.g. Visqueen 2000 gauge), lapped and sealed around service entry and exit points.

In the south west of the site, only levels of carbon dioxide were elevated. Therefore, it is considered that a membrane which has a low permeability to carbon dioxide is likely to be suitable, such as the Visqueen CO2 Gas Membrane.

Through the central part of the site for which ownership has been transferred to the St. James Group, land gas protection measures are being determined directly for them through a separate appointment.

Across the remainder of the site, it is considered unlikely that specific land gas protection measures will be required since elevated levels of land gases appear to be associated either with the landfill adjacent to the north eastern boundary, the landfill at Reading Southside or the Alluvium in the north of the site. It is recommended that an upgraded damp proof membrane (e.g. Visqueen 2000 gauge) is used and is lapped and sealed around service entry and exit points.

It is considered that, across the whole site, below ground access should be restricted and that personal gas monitors and confined space training should be mandatory for anyone entering a manhole or other below ground space with limited ventilation. In the area shown in orange on Drawing No. SK154, it is likely to be necessary to state on the resident covenants that future construction of garages, sheds or conservatories should not be undertaken without planning approval. It is also recommended that the construction of deep ponds by residents is not permitted in this area. Consideration should also be given to similar statements for the remainder of the site when the proposed development plans are known and any further footprint specific monitoring has been undertaken.

If you have any queries regarding the information contained within this letter report, please do not hesitate to contact the undersigned.

Yours Sincerely
For White Young Green Environmental

PATRICIA GILL
Associate

Cc
Catherine Davis, RBC
Rob Harrhy, WYG Bristol
Hillary Bennett, WYGE Croydon

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Environmental

25th September 2008

Ms. C. Lewis
Environment Department
Civic Centre
Reading
RG1 7TD

Dear Catherine,

RE: KENNET ISLAND, READING – PHASE 2 and 2HA LAND GAS MITIGATION MEASURES

Further to our telephone conversation on Thursday 25th September please find outlined below the Phase 2 and Phase 2HA landgas mitigation measures proposed for this phase of the Kennet Island development on the Former Reading Sewage Treatment Works.

Background

The site, known as Kennet Island, is centred on approximately National Grid Reference 471249, 170572 and is located approximately 2km south of Reading town centre. The site, approximately 27ha in area was historically the former Reading Sewage Treatment Works, Manor Farm, is shown on the appended sketch. SK301.

The site has been subjected to several previous stages of intrusive site investigation and subsequent remediation. The enabling works remediation generally comprised the removal of source contamination, comprising sewage sludge, from the northern half of the site and the development remediation works included the implementation of a cover layer. Further detail is given in WYGE Remediation Strategy Report (ref: E03015/PC/MAY05/RS-EAST SITE/V3) and subsequent Validation Report (ref: E03015/PC/APR06/VR/V1). Redevelopment of the site into a mixed use residential and commercial / light industrial area with open space is underway.

The masterplan for Phase 2 and 2HA is illustrated on Design Group 3 drawing no. 716-0010 revP11 attached. The Phase 2 development comprises Blocks R, the northern section of Block P, the northern section of Block N, the southern section of Block O and the northern section of Block E. Phase 2HA development consists of Block V, S, the southern portion of Block P and the southern portion of Block N.

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The baseline landgas conditions for the former sewage treatment site were recorded over a six month monitoring period once the remediation was completed. The land gas monitoring report (ref: pg28Feb07) applies to the whole of the site, with monitoring having been undertaken largely on the site boundary and therefore forms a baseline for the site's ongoing development as it progresses. Phase 2 and 2HA of the St James Group land lies within the southeast portion of the site and the Phase 2 part of Block E lies in the central eastern portion of the site, illustrated on the appended map SK.154. All of these areas lie within areas where landgas mitigation measures are unlikely to be required.

Ground Conditions

The baseline assessment of landgas identifies the sources of the landgas as the natural alluvium, sewage sludge and ingress from off site. Ground conditions of Phase 2 and Phase 2HA are known not to comprise any alluvium or sewage sludge and are located within an area of the site not affected by offsite landfill gas migration (identified in the baseline study as the north east of the site and the south west of the site).

Conclusion

The development of Phase 2 and Phase 2HA of the Kennet Island development is underway and we propose the residential blocks are to be installed with a 2000gauge Damp Proof Membrane which is lapped, taped and sealed around all penetrations.

We do not feel that revisiting site to undertake further drilling and landgas monitoring would be warranted considering the quantity of data and knowledge of the ground conditions already available. We feel that the risk to end users from land gas in this area is low and the mitigation measures being implemented are adequate protection.

We will visit site and inspect the laying of the landgas membrane and will issue a validation report once the development of Phase 2 is complete and a validation report once Phase 2HA is complete.

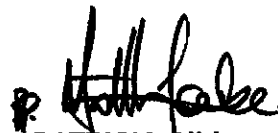
If you have any queries regarding the content of this letter please do not hesitate to contact us.

Yours sincerely

For WYG ENVIRONMENT PLANNING TRANSPORT LIMITED



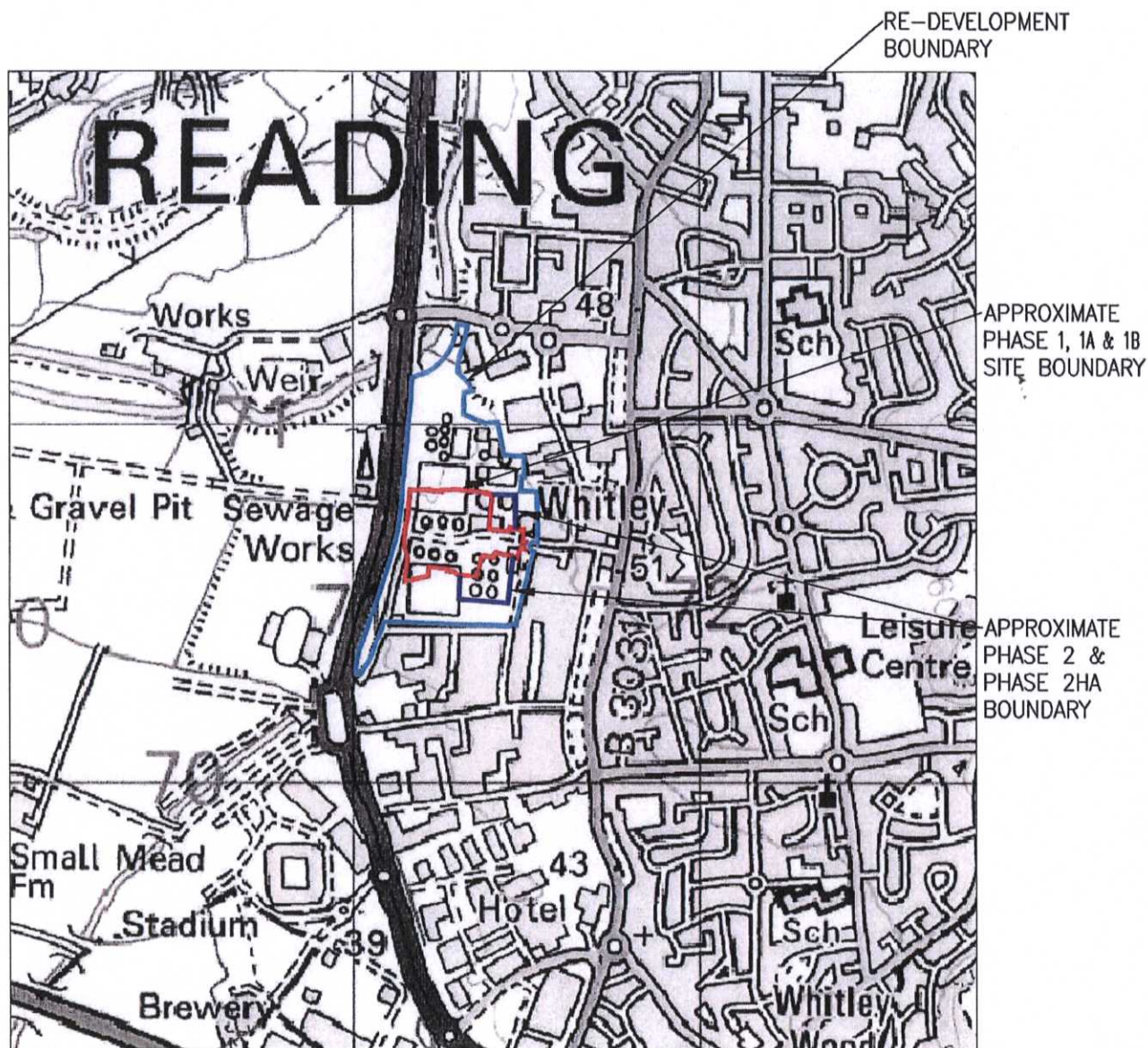
HILLARY BENNETT
Senior Environmental Consultant



PATRICIA GILL
Associate

Cc. Terry Stone, St James Group
Andrew Chugg, Reading Borough Council

Enc: SK301 Site Location Plan
SK154 Anticipated Landgas Protection Measures
Design Group 3 Drawing No. 0010 revP11 Masterplan



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Environmental Consultancy
 Civil Structural Mechanical Electrical Process Rail Traffic Environmental Project Management

Project:
**READING EAST SITE
 LANDSCAPE VALIDATION**

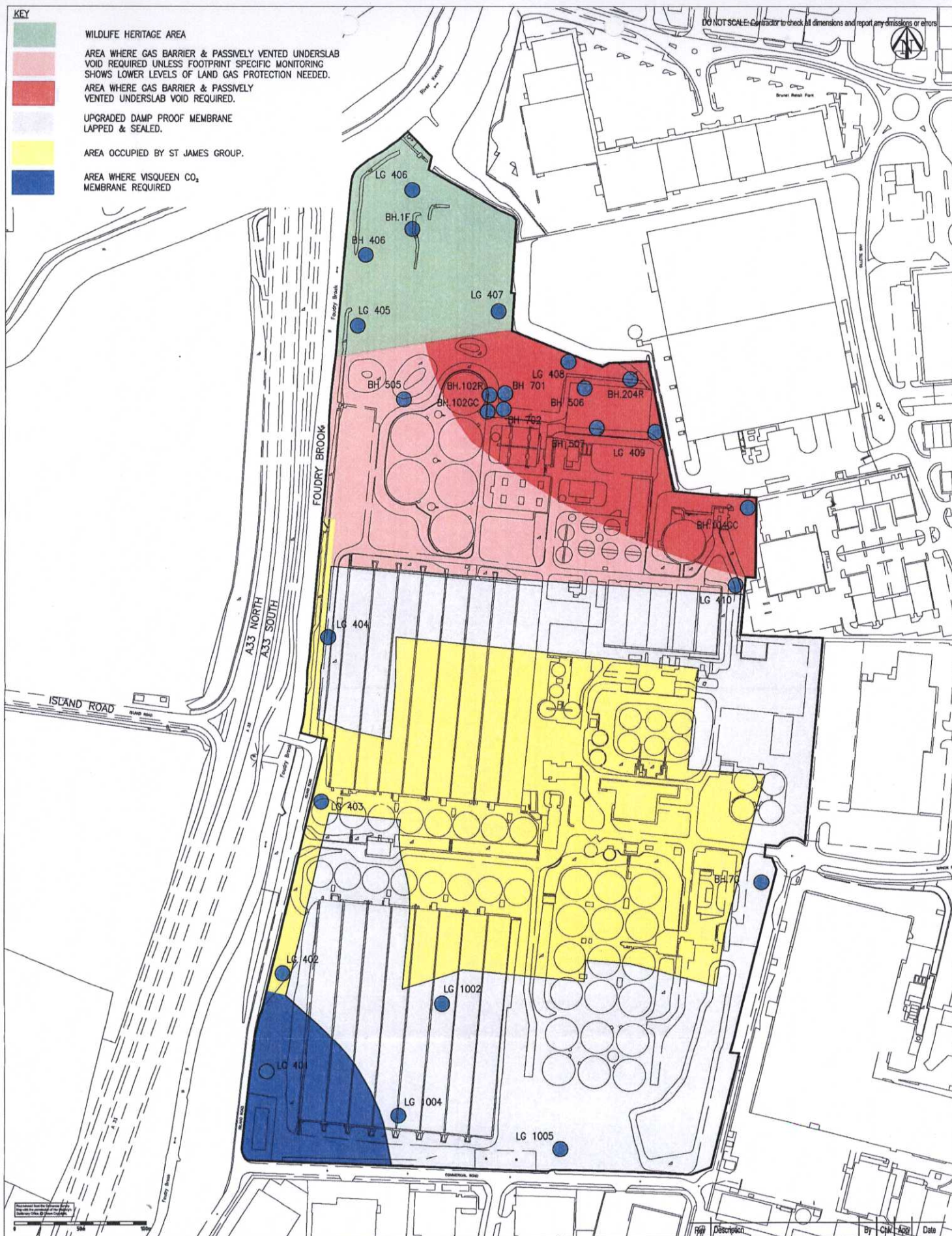
Client:
ST JAMES GROUP

Rev	Description	By	Chk	App	Date
Drawing Title: SITE LOCATION - AREA CONTEXT					
Scale at A4 N.T.S.	Drawn By N.C.	Date APR 2008	Checked By H.S.	Date APR 2008	Approved By P.G.
Office 40	Type ENV	Project No. E03015-5	Drawing No. SK. 301	Revision	

KEY

- WILDLIFE HERITAGE AREA
- AREA WHERE GAS BARRIER & PASSIVELY VENTED UNDERSLAB VOID REQUIRED UNLESS FOOTPRINT SPECIFIC MONITORING SHOWS LOWER LEVELS OF LAND GAS PROTECTION NEEDED.
- AREA WHERE GAS BARRIER & PASSIVELY VENTED UNDERSLAB VOID REQUIRED.
- UPGRADED DAMP PROOF MEMBRANE LAPPED & SEALED.
- AREA OCCUPIED BY ST JAMES GROUP.
- AREA WHERE VISQUEEN CO₂ MEMBRANE REQUIRED

DO NOT SCALE-Consultor to check all dimensions and report any omissions or errors



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**White
Young
Green**

Environmental

Civil Electrical Environmental Health & Safety Highways Management Services Mechanical Rail Structural Town Planning Transportation

Project: E03015

READING SEWAGE TREATMENT WORKS

Client:

KENNET PROPERTIES LTD

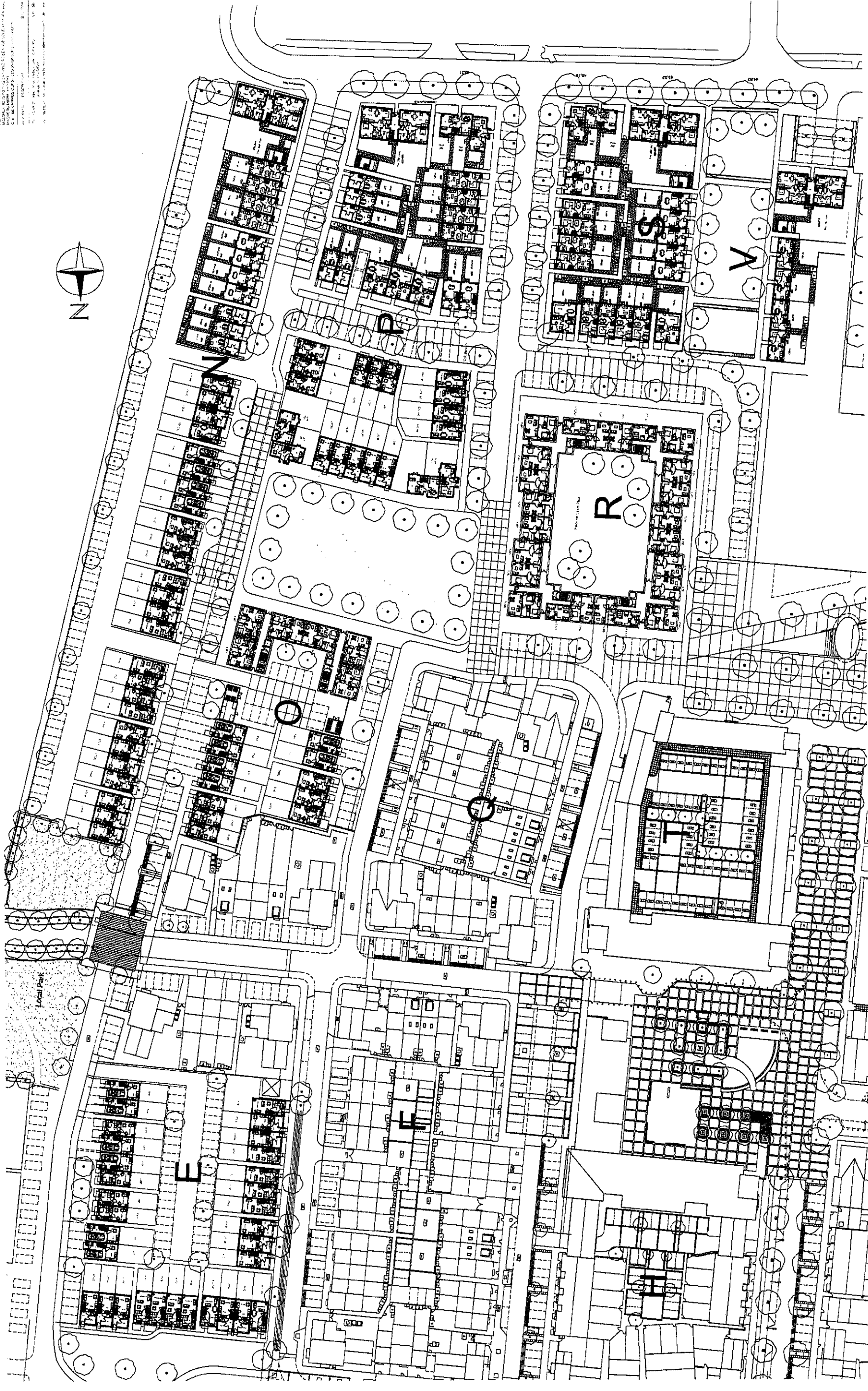
Drawing Title:

ANTICIPATED LAND GAS PROTECTION MEASURES

Scale at A3	Drawn By	Date	Checked By	Date	Approved By	Date
1:2500	CM	FEB 07	CK	FEB 07	PG	FEB 07
Project No.	Office	Type	Drawing No.	Revision		
E03015	40	ENV	SK. 154			

APPROVAL ☐ INFORMATION ☒ TENDER ☐ CONTRACT ☐ CONSTRUCTION ☐

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SOUTHIDE, MANOR FARM - PHASE 2
 SITE PLAN
 Project No: 716
 Date: April 08
 Scale: 1:500 @ A1
 Author: JP
 Checker: NM
 Project: P11

Design Group 3 | Architects

FAO Terry Stone
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Anita Cacchioli
Director of Environment Culture
& Sport

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Minicom ☎ 0118 939 0700
Email:
Andrew.Chugg@reading.gov.uk
Our Ref: 08/01549/APPCON
Your Ref:

☎0118 9390458

30 January 2009

1ST CLASS AND EMAIL:
TERRY.STONE@BERKELEYGROUP.CO.UK

Your contact is: Andrew Chugg, Planning Section

Dear Terry,

RE: PARTIAL DISCHARGE OF CONDITION 10 (CONTAMINATION REMEDIATION) OF PLANNING PERMISSION 05/00548/OUT (KENNET ISLAND, READING) IN RESPECT OF PHASE 2 (BLOCKS R, S, V, P, N, THE SOUTHERN SECTION OF BLOCK O AND THE NORTHERN SECTION OF BLOCK E). APPLICATION REF.: 08/01549/APPCON

I refer to the above and to the information provided by White Young Green in their letter of 25 September 2008 and to the accompanying Anticipated Land Gas Protection Measures plan (drawing no. SK 154) and Site Plan (drawing no. 0010 Revision P11).

I note that the above information has been provided in addition to the approved White Young Green 'Remediation Strategy Report (May 2005) Ref: E03015/PC/MAY05/RS-EAST SITE/V3' that was originally submitted in respect of Phase 1 of Kennet Island.

Following consultation with this Council's Contaminated Land Officer, I hereby confirm that the above information is acceptable and satisfies the requirements of Condition 10 of planning permission 05/00548/OUT in respect of Phase 2 of Kennet Island (Blocks R, S, V, P, N, the southern section of Block O and the northern section of Block E). Therefore, this condition is hereby discharged in respect of 'Phase 2 - Private' and 'Phase 2 - Affordable' only.

To ensure that this condition fully discharged, acceptable information will also need to be submitted and approved in respect of Phase 3, the Hospital site and future commercial uses on the east side of the A33.

If there are any points in this letter that require further clarification please do not hesitate to contact me on number given above.

Yours sincerely,

Andrew Chugg
(Principal Planning Officer, South/West Area Team)

c.c. Angela Doone (RMPL)
Hillary Uffindell-Phillips (WYG)



Appendix C

Landgas Monitoring Prior to Commencing the Development Works

Reading STW
VHE Contract
Land Gas Monitoring Results

Borehole	Investigation	Response Zone Stratum	WEEK 1						WEEK 3					
			date of readings	GA 2000				PID	date of readings	GA 2001				PID
				CH4 %	CO2 %	O2 %	Bero press mb			CH4 %	CO2 %	O2 %	Bero press mb	
BH1F	Soil Mechanics 2000	Made Ground	10/03/2005	0.0	1.3	19.5	1024	0.8	22/03/2005	0.0	1.7	18.8	995	0.0
BH102GC	WYGE 2003	(1) Valley Gravel	10/03/2005	0	2.6	18.7	1024	0.0	22/03/2005	0.0	0.4	20.0	995	0.0
		(2) Chalk	10/03/2005	38.4	15.8	6.5	1024	0.0	22/03/2005	3.5	2.7	17.7	995	0.0
BH102R	WYGE 2003	Lambeth Group	10/03/2005	0.0	0.0	20.5	1024	0.0	22/03/2005	0.0	0.1	20.1	1002	0.0
BH104GC	WYGE 2003	(1) Valley Gravel	10/03/2005	0.0	1.1	18.9	1023	0.0	22/03/2005	0.0	5.5	14.4	996	0.0
		(2) London Clay	10/03/2005	0.0	0.8	19.3	1023	0.0	22/03/2005	0.0	0.0	20.2	996	0.0
BH201	WYGE 2004	Chalk	16/03/2005	0.0	0.1	20.1	1011	0.0	22/03/2005	0.0	0.1	20.0	991	0.0
BH7G	Soil Mechanics 2000	London Clay	10/03/2005	0.0	1.00	20.1	1024	2.2	22/03/2005	0.0	0.60	19.8	996	1.2
BH204R	WYGE 2004	Lambeth Group												
LG401	VHE 2005	Made ground												
LG402	VHE 2005	Made ground												
LG403	VHE 2005	Made ground												
LG404	VHE 2005	Made ground												
LG405	VHE 2005	Made ground												
LG406	VHE 2005	Made ground												
LG407	VHE 2005	Made ground												
LG408	VHE 2005	Made ground												
LG409	VHE 2005	Made ground												
LG410	VHE 2005	Made ground												
BH506	VHE 2005	Alluvium												
BH507	VHE 2005	Alluvium												
BH508	VHE 2005	Alluvium												

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

Reading STW
VHE Contract
Land Gas Monitoring Results

Borehole	Investigation	Response Zone Stratum	WEEK 5							WEEK 7						
			date of readings	GA 2002			Bero	Flow	PID	date of readings	GA 2002			Bero	Flow	PID
				CH4 %	CO2 %	O2 %					CH4 %	CO2 %	O2 %			
BH1F	Soil Mechanics 2000	Made Ground	04/04/2005	0.0	2.2	17.9	1014		0.0	19/04/2005	0.0	1.9	17.7	997	12.9	0.1
BH102GC	WVGE 2003	(1) Valley Gravel (2) Chalk	04/04/2005	0.0	0.1	20.0	1013		0.0	21/04/2005	0.0	0.2	19.9	1014	12.6	0.0
			04/04/2005	0.1	0.1	19.9	1013		0.0	21/04/2005	0.0	0.3	19.8	1014	12.3	0.0
BH102R	WVGE 2003	Lambeth Group	04/04/2005	0.0	0.6	19.3	1014		0.0	21/04/2005	0.0	0.1	19.9	1014	12.3	0.0
									No cover on BH102R							
BH104GC	WVGE 2003	(1) Valley Gravel (2) London Clay	04/04/2005	0.0	2.0	17.7	1012		0.1	19/04/2005	0.0	1.6	17.7	997	13.2	0.7
			04/04/2005	0.0	0.0	19.9	1012		0.0	19/04/2005	0.0	0.1	19.4	997	13.2	0.5
BH201	WVGE 2004	Chalk	04/04/2005	0.0	0.1	20.1	1014		0.0	19/04/2005	0.0	0.0	19.6	999	13.2	0.1
BH7G	Soil Mechanics 2000	London Clay	04/04/2005	0.0	0.3	19.7	1013		0.0	19/04/2005	0.0	0.4	19.3	998	13.3	2.0
BH204R	WVGE 2004	Lambeth Group								21/04/2005	0	0.1	19.8	1013	12.7	0
LG401	VHE 2005	Made ground														
LG402	VHE 2005	Made ground														
LG403	VHE 2005	Made ground														
LG404	VHE 2005	Made ground														
LG405	VHE 2005	Made ground														
LG406	VHE 2005	Made ground														
LG407	VHE 2005	Made ground														
LG408	VHE 2005	Made ground														
LG409	VHE 2005	Made ground														
LG410	VHE 2005	Made ground														
BH506	VHE 2005	Alluvium														
BH507	VHE 2005	Alluvium														
BH508	VHE 2005	Alluvium														

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

Reading STW
VHE Contract
Land Gas Monitoring Results

WEEK 9																		WEEK 11					
Borehole	Investigation	Response Zone Stratum	date of readings	GA 2002					PID			Flow on 11/05/05	date of readings	GA 2002			PID						
				CH4 %	CO2 %	O2 %	Bero press mb	Flow	VOC	CH4 %	CO2 %			O2 %	Bero press mb	Flow	VOC						
BH1F	Soil Mechanics 2000	Made Ground	06/05/2005	0.0	1.4	18.5	1013	13.0	0.4		0.2	19/05/2005	0.0	4.8	14.3	1009	0.4	0.0					
BH102GC	WYGE 2003	(1) Valley Gravel	06/05/2005	0.0	0.0	19.8	1012	12.9	0.0	0.4	19/05/2005	0.0	0.3	19.3	1009	0.7	0.0						
		(2) Chalk	06/05/2005	0.0	0.4	19.5	1012	12.9	0.0	0.3	19/05/2005	0.0	0.4	19.4	1009	0.4	0.0						
BH102R	WYGE 2003	Lambeth Group	06/05/2005	0.0	0.0	19.6	1012	13.0	0.0	0.6	19/05/2005	0.0	0.1	19.7	1009	0.7	0.0						
BH104GC	WYGE 2003	(1) Valley Gravel	06/05/2005	0.0	1.9	17.6	1012	12.6	0.0	0.5	19/05/2005	0.0	1.9	17.9	1007	0.5	0.0						
		(2) London Clay	06/05/2005	0.0	0.1	19.7	1012	12.7	0.0	0.8	19/05/2005	0.0	0.2	19.7	1007	0.4	0.0						
BH201	WYGE 2004	Chalk	06/05/2005	0.0	0.0	19.6	1013	13.0	0.0	0.4	19/05/2005	0.0	0.0	19.8	1009	0.3							
BH7G	Soil Mechanics 2000	London Clay	06/05/2005	0.0	0.9	18.8	1012	13.2	0.0	0.7	19/05/2005	0.0	0.7	19.5	1007	0.2	0.0						
BH204R	WYGE 2004	Lambeth Group	06/05/2005	0.0	14.2	8.5	1012	12.9	0.0	0.4	19/05/2005	0	1.6	18.2	1009	0.8	0						
LG401	VHE 2005	Made ground	16/05/2005	0.0	1.3	18.6	1011	0.4	0.0		19/05/2005	0	0.2	19.6	1009	0.6	0						
LG402	VHE 2005	Made ground	16/05/2005	0.0	3.5	17.2	1011	1.5	0.0		19/05/2005	0	4.2	16.8	1008	0.9	0.1						
LG403	VHE 2005	Made ground	16/05/2005	0.1	0.1	18.3	1011	2.3	0.0		19/05/2005	0	0	19.8	1008	0.2	0						
LG404	VHE 2005	Made ground	16/05/2005	0.0	0.0	19.9	1011	0.5	0.0		19/05/2005	0	3.2	16.5	1009	0.5	0						
LG405	VHE 2005	Made ground	16/05/2005	0.0	0.0	19.7	1011	0.4	0.0		19/05/2005	0	4.4	14.2	1009	0.2	0						
LG406	VHE 2005	Made ground	16/05/2005	0.0	2.7	17.0	1011	0.3	0.0		19/05/2005	0	2.6	16.6	1009	0.2	0						
LG407	VHE 2005	Made ground	16/05/2005	0.0	0.4	18.6	1011	0.8	0.0		19/05/2005	0	1.6	17.4	1009	0.5	0						
LG408	VHE 2005	Made ground	16/05/2005	3.0	2.5	18.2	1011	1.3	0.0		19/05/2005	2.3	5	16.8	1009	0.8	0						
LG409	VHE 2005	Made ground	16/05/2005	0.0	0.6	19.8	1011	0.2	0.5		19/05/2005	0	0.6	19.6	1009	0.6	0						
LG410	VHE 2005	Made ground	16/05/2005	0.0	0.1	19.6	1010	0.3	0.0		19/05/2005	0	0.3	19.4	1007	0.1	0.3						
BH506	VHE 2005	Alluvium																					
BH507	VHE 2005	Alluvium																					
BH508	VHE 2005	Alluvium																					

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

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WEEK 13													WEEK 15												
Borehole	Investigation	Response Zone Stratum	date of readings	GA 2002			Bero press mb	Flow	PID VOC	date of readings	GA 2002			Bero press mb	Flow	PID VOC									
				CH4 %	CO2 %	O2 %					CH4 %	CO2 %	O2 %												
BH1F	Soil Mechanics 2000	Made Ground	01/06/2005	0.0	2.9	17.2	1014	0.4	2.8	14/06/2005	0	4.8	14	1004	0.3	0									
BH102GC	WYGE 2003	(1) Valley Gravel (2) Chalk	01/06/2005 01/06/2005	0.0 6.6	0.1 2.9	19.6 16.2	1012 1012	0.8 0.6	0.0 0.0	14/06/2005 14/06/2005	0 23	0.5 8.3	18.5 9.7	1004 1004	0.1 0.8	0 0									
BH102R	WYGE 2003	Lambeth Group								14/06/2005	0	0	19.5	1004	0.6	0									
BH104GC	WYGE 2003	(1) Valley Gravel (2) London Clay	01/06/2005 01/06/2005	0.0 0.0	1.7 0.0	18.1 19.9	1012 1012	0.7 0.3	0.0 0.0	14/06/2005 14/06/2005	0 0	0.7 0.1	18.7 19.4	1004 1004	0.3 0.2	0 0									
BH201	WYGE 2004	Chalk	01/06/2005	0.0	0.0	19.8	1013	0.4	0.0	14/06/2005	0	0	19.6	1004	0.3	0									
BH7G	Soil Mechanics 2000	London Clay	01/06/2005	0.0	0.7	19.3	1012	0.2	0.0	14/06/2005	0	0.3	19.5	1004	0.4	0									
BH204R	WYGE 2004	Lambeth Group	01/06/2005	0.0	2.3	17.7	1013	0.4	0.0	14/06/2005	0	3	16.7	1003	0.2	0									
LG401	VHE 2005	Made ground	01/06/2005	0.0	0.5	19.1	1013	0.5	0.0	14/06/2005	0	2.8	17.7	1003	0.3	0									
LG402	VHE 2005	Made ground	01/06/2005	0.0	0.7	19.2	1013	0.4	0.0	14/06/2005	0	4.5	16.4	1003	0.3	0									
LG403	VHE 2005	Made ground	01/06/2005	0.0	0.3	19.4	1013	0.4	0.0	14/06/2005	0	1.4	17.4	1004	0.5	0									
LG404	VHE 2005	Made ground	01/06/2005	0.0	6.0	11.8	1013	0.2	0.0	14/06/2005	0.1	2.7	16.5	1003	0.8	0									
LG405	VHE 2005	Made ground	01/06/2005	0.0	4.9	12.7	1014	0.6	0.0	14/06/2005	0	5.8	13.5	1004	0.4	0									
LG406	VHE 2005	Made ground	01/06/2005	0.0	5.0	14.9	1014	0.3	0.0	14/06/2005	0	5.1	14.6	1004	0.7	0									
LG407	VHE 2005	Made ground	01/06/2005	0.0	1.9	17.2	1014	1.2	0.0	14/06/2005	0.1	3.7	13.8	1004	0.1	0									
LG408	VHE 2005	Made ground	01/06/2005	0.0	6.9	14.2	1014	0.7	0.0	unable to take readings due to excavations around borehole															
LG409	VHE 2005	Made ground	01/06/2005	0.0	0.7	19.7	1013	0.7	0.0	14/06/2005	0	0.3	19	1004	0.5	0.4									
LG410	VHE 2005	Made ground	01/06/2005	0.0	0.8	19.1	1012	0.1	0.0	14/06/2005	0	0	19.5	1004	0.1	0									
BH506	VHE 2005	Alluvium																							
BH507	VHE 2005	Alluvium																							
BH508	VHE 2005	Alluvium																							

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

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Borehole	Investigation	Response Zone Stratum	date of readings	WEEK 17					PID	WEEK 19					PID
				GA 2002	CH4 %	CO2 %	O2 %	Bero press mb		GA 2002	CH4 %	CO2 %	O2 %	Bero press mb	
BH1F	Soil Mechanics 2000	Made Ground	01/07/2005	0.0	0.0	0.7	18.3	1006	0.7	0.0	0.0	1.3	18.2	1016	0.5
BH102GC	WYGE 2003	(1) Valley Gravel (2) Chalk	01/07/2005 01/07/2005	destroyed destroyed											
BH102R	WYGE 2003	Lambeth Group	01/07/2005	destroyed											
BH104GC	WYGE 2003	(1) Valley Gravel (2) London Clay	01/07/2005 01/07/2005									0.4	19.1	1014	0.6
BH201	WYGE 2004	Chalk	01/07/2005	0.0	0.0	0.0	18.9	1006	0.5	0.0	0.0	0.5	19.3	1016	0.7
BH7G	Soil Mechanics 2000	London Clay	01/07/2005	0.0	0.3	18.2	18.2	1006	0.2	1.5	0.1	0.1	19.3	1014	0.5
BH204R	WYGE 2004	Lambeth Group	01/07/2005	0.0	0.0	3.2	16.4	1006	0.6	0.0	0.0	6	13.5	1015	0.3
LG401	VHE 2005	Made ground	01/07/2005	0.0	0.0	17.0	9.3	1006	-0.3	0.7	0.0	19.3	6.2	1016	0.6
LG402	VHE 2005	Made ground	01/07/2005	0.0	0.0	2.5	18.1	1006	0.2	0.5	0.0	2.7	17.2	1015	0.2
LG403	VHE 2005	Made ground	01/07/2005	0.0	0.0	1.3	18.3	1006	0.2	0.0	0.0	0.7	18	1016	0.6
LG404	VHE 2005	Made ground	01/07/2005	0.0	0.0	3.9	15.5	1006	0.5	0.2	0.0	3.2	15.5	1016	0.4
LG405	VHE 2005	Made ground	01/07/2005	0.0	0.0	5.3	10.9	1006	0.6	1.2	0.0	5.2	13.3	1016	0.3
LG406	VHE 2005	Made ground	01/07/2005	0.0	0.0	4.5	15.0	1006	0.5	0.0	0.0	0.1	19.1	1015	0.4
LG407	VHE 2005	Made ground	01/07/2005	buried											
LG408	VHE 2005	Made ground	01/07/2005	0.2	0.2	0.9	0.1	1006	0.1	0.2	14/07/2005 destroyed				
LG409	VHE 2005	Made ground	01/07/2005	0.0	0.0	0.9	19.0	1006	0.3	0.4	0.0	0.7	18.9	1015	0.5
LG410	VHE 2005	Made ground	01/07/2005	0.0	0.0	1.0	18.2	1006	0.1	0.5	0.0	0.3	18.9	1014	0.8
BH506	VHE 2005	Alluvium													
BH507	VHE 2005	Alluvium													
BH508	VHE 2005	Alluvium													

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

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WEEK 21													WEEK 23												
Borehole	Investigation	Response Zone Stratum	date of readings	GA 2002			Bero press mb	Flow	PID VOC	date of readings	GA 2002			Bero press mb	Flow	PID VOC									
				CH4 %	CO2 %	O2 %					CH4 %	CO2 %	O2 %												
BH1F	Soil Mechanics 2000	Made Ground	25/07/2005	0	1.3	18.6	1015	0.7		11/08/2005	0	2.4	17.5	1014	0.5	0									
BH102GC	WYGE 2003	(1) Valley Gravel (2) Chalk																							
BH102R	WYGE 2003	Lambeth Group																							
BH104GC	WYGE 2003	(1) Valley Gravel (2) London Clay	25/07/2005 25/07/2005	0 0	3.4 1.3	16.3 18.2	1014 1014	0.7 0.9	0 0.3	11/08/2005 11/08/2005	0 0	1.6 1.2	18.1 18.2	1014 1014	0.8 0.6	0 0									
BH201	WYGE 2004	Chalk	25/07/2005	0	0.8	18.9	1015	0.8	0	11/08/2005	0	0.7	19.2	1015	0.5	0									
BH7G	Soil Mechanics 2000	London Clay	covered by trees cuttings																						
BH204R	WYGE 2004	Lambeth Group	25/07/2005	0	3.3	16.1	1014	1.5	2.2	11/08/2005	0	4.2	14.4	1014	0.6	0									
LG401	VHE 2005	Made ground	25/07/2005	0	16.6	7.4	1015	0.5	0	11/08/2005	0	14.7	6.6	1014	0.7	0									
LG402	VHE 2005	Made ground	25/07/2005	0	2.3	18.1	1015	0.5	0	11/08/2005	0	3.4	16.7	1014	0.8	0									
LG403	VHE 2005	Made ground	25/07/2005	0	3.2	14.2	1015	0.8	0	11/08/2005	0	3.3	16.1	1014	0.7	0									
LG404	VHE 2005	Made ground	25/07/2005	0	2	16.9	1015	0.3	0	11/08/2005	0	1.7	18.9	1015	0.5	0									
LG405	VHE 2005	Made ground	25/07/2005	0	3.7	15.1	1015	0.6	0	11/08/2005	0	3.4	16.2	1014	0.6	0									
LG406	VHE 2005	Made ground	25/07/2005	0	0	19.7	1015	0.8	0	11/08/2005	0	0.4	19.8	1014	0.3	0									
G407	VHE 2005	Made ground																							
LG408	VHE 2005	Made ground																							
LG409	VHE 2005	Made ground	25/07/2005	0	0	19.3	1014	1.3	0	11/08/2005	0	0	19.6	1015	0.6	0									
LG410	VHE 2005	Made ground	25/07/2005	0	2.1	17.2	1014	0.8	0	11/08/2005	0	3.5	16.7	1014	0.6	0									
BH506	VHE 2005	Alluvium																							
BH507	VHE 2005	Alluvium																							
BH508	VHE 2005	Alluvium																							

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

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WEEK 25										WEEK 27							
				GA 2002				GA 2002				GA 2002					
Borehole	Investigation	Response Zone Stratum	date of readings	CH4 %	CO2 %	O2 %	Bero press mb	Flow	PID	VOC	date of readings	CH4 %	CO2 %	O2 %	Bero press mb	Flow	PID
BH1F	Soil Mechanics 2000	Made Ground	26/08/2005	0	3.1	16.4	1009	0.6		0	09/09/2005	0	4.9	13.9	1003	0.8	0
BH102GC	WYGE 2003	(1) Valley Gravel (2) Chalk															
BH102R	WYGE 2003	Lambeth Group															
BH104GC	WYGE 2003	(1) Valley Gravel (2) London Clay	26/08/2005 26/08/2005	0 0	4.5 6.2	14.7 11.1	1009 1009	0.5 0.8	0 0	0 0	09/09/2005 09/09/2005	0 0	3.2 0.4	16.4 18.6	1003 1003	0.1 0.3	0 0
BH201	WYGE 2004	Chalk	26/08/2005	0	0	19.1	1009	0.6	0	0	09/09/2005	0	0	19	1003	0.9	0
BH7G	Soil Mechanics 2000	London Clay															
BH204R	WYGE 2004	Lambeth Group	26/08/2005	15.2	28.6	1.7	1009	0.1	0	0	09/09/2005	13.1	25.6	5.3	1003	0.2	0
LG401	VHE 2005	Made ground	26/08/2005	0	11.9	11	1009	0.2	0	0	09/09/2005	0	17.7	6.6	1003	0.5	0
LG402	VHE 2005	Made ground	26/08/2005	0	0.2	19.1	1009	0.5	0	0	09/09/2005	0	2.3	17.5	1003	0.4	0
LG403	VHE 2005	Made ground	26/08/2005	0	0.9	17.9	1009	0.6	0	0	09/09/2005	0	0	18.9	1003	0.1	0
LG404	VHE 2005	Made ground	26/08/2005	0	4.3	13.4	1009	0.2	0	0	09/09/2005	0	5.1	12.8	1003	0.7	0
LG405	VHE 2005	Made ground	26/08/2005	0	5.8	12.9	1009	0.1	0	0	09/09/2005	0	0.5	18.2	1003	0.5	0
LG406	VHE 2005	Made ground	26/08/2005	0	3.6	15	1009	0.4	0	0	09/09/2005	0	0.7	17.8	1003	0.9	0
LG407	VHE 2005	Made ground															
LG408	VHE 2005	Made ground															
LG409	VHE 2005	Made ground buried beneath material in landfill															
LG410	VHE 2005	Made ground	26/08/2005	0	0.7	18.4	1009	0.4	0	0	09/09/2005	0	0.5	18.2	1003	0.4	0
BH506	VHE 2005	Alluvium															
BH507	VHE 2005	Alluvium															
BH508	VHE 2005	Alluvium															

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

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Borehole	Investigation	Response Zone Stratum	date of readings	WEEK 29						WEEK 31					
				GA 2002						GA 2002					
				CH4 %	CO2 %	O2 %	Bero press mb	Flow	PID VOC	date of readings	CH4 %	CO2 %	O2 %	Bero press mb	PID VOC
BH1F	Soil Mechanics 2000	Made Ground	23/09/2005	0	2.1	18.7	1000	0.6	0	07/10/2005	0	3.5	16.4	1009	0.6
BH102GC	WYGE 2003	(1) Valley Gravel (2) Chalk													
BH102R	WYGE 2003	Lambeth Group													
BH104GC	WYGE 2003	(1) Valley Gravel (2) London Clay	23/09/2005	2.5	1.2	15.7	1014	0.5	0	07/10/2005	1.3	2.4	17.6	1009	0.3
			23/09/2005	0	0	19.5	1014	0.5	0	07/10/2005	0	0	19.1	1009	0.4
BH201	WYGE 2004	Chalk	23/09/2005	0	0.1	18.7	1014	1.2	0	07/10/2005	0	0	18.7	1009	0.5
BH7G	Soil Mechanics 2000	London Clay													
BH204R	WYGE 2004	Lambeth Group	23/09/2005	8.9	12.3	15.6	1014	0.9	0	07/10/2005	7.6	14.3	12.7	1009	1.2
LG401	VHE 2005	Made ground	23/09/2005	0.3	15.6	8.9	1014	0.4	0	07/10/2005	0	16.4	6.7	1009	0.3
LG402	VHE 2005	Made ground	23/09/2005	0	3.5	18.4	1014	0.6	0	07/10/2005	0	4.2	16.7	1009	0.7
LG403	VHE 2005	Made ground	23/09/2005	0	0.4	17.6	1014	1	0	07/10/2005	0	0	19.7	1009	0.9
LG404	VHE 2005	Made ground	23/09/2005	0	3.3	15.3	1014	0.7	0	07/10/2005	0	4.1	15.8	1009	0.6
LG405	VHE 2005	Made ground	23/09/2005	0	0	19.1	1014	0.6	0	07/10/2005	0	0	19.6	1009	1
LG406	VHE 2005	Made ground	23/09/2005	0	0.6	18.9	1014	0.8	0	07/10/2005	0	0.7	18.5	1009	0.5
LG407	VHE 2005	Made ground													
LG408	VHE 2005	Made ground													
LG409	VHE 2005	Made ground	23/09/2005	0	0	19.8	1014	0.4	0	07/10/2005	0	0	19	1009	0.4
LG410	VHE 2005	Made ground	23/09/2005	0	0	19.1	1014	0.7	0	07/10/2005	0	0	19.2	1009	0
BH506	VHE 2005	Alluvium													
BH507	VHE 2005	Alluvium													
BH508	VHE 2005	Alluvium													

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

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WEEK 33																	WEEK 35						
GA 2002										GA 2002													
Borehole	Investigation	Response Zone Stratum	date of readings	CH4 %	CO2 %	O2 %	Bero press mb	Flow	PID	VOC	date of readings	CH4 %	CO2 %	O2 %	Bero press mb	Flow	PID						
BH1F	Soil Mechanics 2000	Made Ground	20/10/2005	0.1	4.1	15.6	1000	0.5		0	03/11/2005	0.0	0.7	18.3	1009	0.7	0						
BH102GC	WYGE 2003	(1) Valley Gravel (2) Chalk																					
BH102R	WYGE 2003	Lambeth Group																					
BH104GC	WYGE 2003	(1) Valley Gravel (2) London Clay	20/10/2005 20/10/2005	2.4 0	2.1 0	16.4 19.8	1000 1000	0.9 0.6		0 0	03/11/2005 03/11/2005	0.0 0.0	1.1 0.8	18.9 19.3	1009 1009	0.7 0.9	0 0						
BH201	WYGE 2004	Chalk	20/10/2005	0	0	19.1	1000	0.6		0	03/11/2005	0.0	0.0	18.9	1009	0.8	0						
BH7G	Soil Mechanics 2000	London Clay																					
BH204R	WYGE 2004	Lambeth Group	20/10/2005	8.4	12.4	15.1	1000	0.8		0	03/11/2005	8.9	12.3	15.6	1009	1.5	0						
LG401	VHE 2005	Made ground	20/10/2005	0	16.7	7.9	1000	0.9		0	03/11/2005	0	17.3	6.2	1009	0.5	0						
LG402	VHE 2005	Made ground	20/10/2005	0	3.4	15.8	1000	0.6		0	03/11/2005	0.0	2.5	18.1	1009	0.5	0						
LG403	VHE 2005	Made ground	20/10/2005	0	0	18.6	1000	0.4		0	03/11/2005	0.0	0.3	19.4	1009	0.8	0						
LG404	VHE 2005	Made ground	20/10/2005	0	5.4	15.2	1000	0.5		0	03/11/2005	0.1	2.7	16.5	1009	0.3	0						
LG405	VHE 2005	Made ground	20/10/2005	0	0	19.3	1000	0.3		0	03/11/2005	0.0	4.9	12.7	1009	0.6	0						
LG406	VHE 2005	Made ground	20/10/2005	0	0	19.9	1000	0.8		0	03/11/2005	0	0	19.7	1009	0.8	0						
LG407	VHE 2005	Made ground																					
LG408	VHE 2005	Made ground																					
LG409	VHE 2005	Made ground	20/10/2005	0	0	18.7	1000	0.4		0	03/11/2005	0.0	0.6	19.8	1009	1.3	0						
LG410	VHE 2005	Made ground	20/10/2005	0	0	19.4	1000	0.6		0	03/11/2005	0	0	19.2	1009	0.8	0						
BH506	VHE 2005	Alluvium	20/10/2005	0	0	19.3	1000	0.6		0	03/11/2005	0	1.3	18.7	1009	0.5	0						
BH507	VHE 2005	Alluvium	20/10/2005	0	0	19.3	1000	0.5		0	03/11/2005	0	0	19.1	1009	0.3	0						
BH508	VHE 2005	Alluvium	20/10/2005	0	1.2	17.6	1000	0.7		0	03/11/2005	0	1.5	18.4	1009	0.9	0						

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

Reading STW
VHE Contract
Land Gas Monitoring Results

WEEK 37											WEEK 37 - re-test										
Borehole	Investigation	Response Zone Stratum	date of readings	GA 2002			Bero		PID		date of readings	GA 2002			Bero		PID				
				CH4 %	CO2 %	O2 %	press mb	Flow	VOC	CH4 %		CO2 %	O2 %	press mb	Flow	VOC					
Borehole	Investigation	Response Zone Stratum	date of readings	CH4 %	CO2 %	O2 %	press mb	Flow	VOC		date of readings	CH4 %	CO2 %	O2 %	press mb	Flow	VOC				
BH1F	Soil Mechanics 2000	Made Ground	18/11/2005	0.0	0.0	19.9	1015	0.6	0		21/11/2005	0.0	0.0	21.3	1026	0.4	0				
BH102GC	WYGE 2003	(1) Valley Gravel (2) Chalk																			
BH102R	WYGE 2003	Lambeth Group																			
BH104GC	WYGE 2003	(1) Valley Gravel (2) London Clay	18/11/2005	0.0	0.8	19.4	1015	0.5	0		21/11/2005	0.0	0.0	21.4	1026	0.5	0				
			18/11/2005	0.0	0.0	19.6	1015	0.3	0		21/11/2005	0.0	0.0	21.3	1026	0.3	0				
BH201	WYGE 2004	Chalk	18/11/2005	0.0	0.0	19.0	1015	0.9	0		21/11/2005	0.0	0.0	21.6	1026	0.8	0				
BH7G	Soil Mechanics 2000	London Clay																			
BH204R	WYGE 2004	Lambeth Group	18/11/2005	6.8	9.5	13.4	1015	0.7	0		21/11/2005	2.2	7.1	12.6	1026	0.5	0				
LG401	VHE 2005	Made ground	18/11/2005	0	12.5	8.6	1015	0.8	0		21/11/2005	0	0	21.3	1027	0.4	0				
LG402	VHE 2005	Made ground	18/11/2005	0.0	0.0	19.2	1015	0.4	0		21/11/2005	0.0	0.0	21.5	1027	0.8	0				
LG403	VHE 2005	Made ground	18/11/2005	0.0	0.0	19.9	1015	0.6	0		21/11/2005	0.0	2.0	18.1	1026	1.2	0				
LG404	VHE 2005	Made ground	18/11/2005	0	1.1	18.6	1015	0.5	0		21/11/2005	0	3.9	16.8	1026	0.9	0				
LG405	VHE 2005	Made ground	18/11/2005	0.0	2.4	19.1	1015	0.3	0		21/11/2005	0.0	5.8	14.5	1026	0.8	0				
LG406	VHE 2005	Made ground	18/11/2005	0	0	19.9	1015	0.6	0		21/11/2005	0	0.1	21.7	1026	0.5	0				
LG407	VHE 2005	Made ground																			
LG408	VHE 2005	Made ground																			
LG409	VHE 2005	Made ground	18/11/2005	0.0	0.0	19.8	1015	0.9	0		21/11/2005	0.0	0.0	20.9	1026	0.9	0				
LG410	VHE 2005	Made ground	18/11/2005	0	0	19.7	1015	0.6	0		21/11/2005	0	0	21.4	1026	0.5	0				
BH506	VHE 2005	Alluvium	18/11/2005	0	0	19.5	1015	0.8	0		21/11/2005	0	0.2	21.3	1026	0.6	0				
BH507	VHE 2005	Alluvium	18/11/2005	0	0	19.8	1015	0.4	0		21/11/2005	0	0	21.6	1026	0.7	0				
BH508	VHE 2005	Alluvium	18/11/2005	0	0	19.6	1015	0.7	0		21/11/2005	0	0	19.8	1026	0.3	0				

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

Reading STW
VHE Contract
Land Gas Monitoring Results

Borehole	Investigation	Response Zone Stratum	date of readings	Week 39					PID	Week 41					PID
				CH4 %	CO2 %	O2 %	Bero press mb	Flow		date of readings	CH4 %	CO2 %	O2 %	Bero press mb	
BH1F	Soil Mechanics 2000	Made Ground	01/12/2005	0.0	0.0		1014	0.5		16/12/2005	0.0	1.3	19.5	1021	0.6
BH102GC	WYGE 2003	(1) Valley Gravel (2) Chalk													
BH102R	WYGE 2003	Lambeth Group													
BH104GC	WYGE 2003	(1) Valley Gravel (2) London Clay	01/12/2005	0.0	0.5	20.5	1014	0.6		16/12/2005	0.0	1.9	17.6	1021	0.4
BH201	WYGE 2004	Chalk	01/12/2005	0.0	0.0	20.6	1014	0.9		16/12/2005	0.0	0.0	19.8	1021	0.9
BH7G	Soil Mechanics 2000	London Clay													
BH204R	WYGE 2004	Lambeth Group	01/12/2005	0	5.7	17.1	1014	0.7		16/12/2005	0	4.2	14.4	1021	0.2
LG401	VHE 2005	Made ground	01/12/2005	0	0	21.4	1014	0.3		16/12/2005	0.0	1.3	18.6	1021	0.5
LG402	VHE 2005	Made ground	01/12/2005	0.0	1.2	21.2	1014	0.7		16/12/2005	0	3.5	18.4	1021	0.8
LG403	VHE 2005	Made ground	01/12/2005	0.0	3.4	18.7	1014	0.6		16/12/2005	0	1.4	17.4	1021	0.6
LG404	VHE 2005	Made ground	01/12/2005	0	2.5	17.8	1014	0.4		16/12/2005	0.0	0.0	19.9	1021	0.1
LG405	VHE 2005	Made ground	01/12/2005	0.0	6.0	15.6	1014	0.5		16/12/2005	0.0	0.0	19.7	1021	0.5
LG406	VHE 2005	Made ground	01/12/2005	0	0	21.2	1014	0.9		16/12/2005	0.0	2.7	17.0	1021	0.3
LG407	VHE 2005	Made ground													
LG408	VHE 2005	Made ground													
LG409	VHE 2005	Made ground	01/12/2005	0.0	0.0	21.7	1014	1.1		16/12/2005	0	0	19.6	1021	0.4
LG410	VHE 2005	Made ground	01/12/2005	0	0	21.9	1014	0.8		16/12/2005	0	2.1	17.2	1021	0.3
BH506	VHE 2005	Alluvium	01/12/2005	0	0	20.6	1014	0.6		16/12/2005	0	0	21.5	1021	0.2
BH507	VHE 2005	Alluvium	01/12/2005	0	0	20.3	1014	0.5		16/12/2005	0	0	21.3	1021	0.8
BH508	VHE 2005	Alluvium	01/12/2005	0	0	21.6	1014	0.5		16/12/2005	0	0	20.9	1021	0.6

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

Reading STW
VHE Contract
Land Gas Monitoring Results

Week 43													Week 45												
			GA 2002				Bero		PID					GA 2002				Bero		PID					
Borehole	Investigation	Response Zone Stratum	date of readings	CH4 %	CO2 %	O2 %	press mb	Flow	VOC	date of readings	CH4 %	CO2 %	O2 %	press mb	Flow	VOC									
BH1F	Soil Mechanics 2000	Made Ground	05/01/2006	0.0	0.0	20.5	1015	0.5	0	20/01/2006	0.0	0.0	20.6	1021	0.8	0									
BH102GC	WYGE 2003	(1) Valley Gravel (2) Chalk																							
BH102R	WYGE 2003	Lambeth Group																							
BH104GC	WYGE 2003	(1) Valley Gravel (2) London Clay	05/01/2006	0.0	2.0	17.7	1015	0.8	0	20/01/2006	0.0	2.5	20.0	1021	0.4	0									
			05/01/2006	0.0	0.0	19.9	1015	1.1	0	20/01/2006	0.0	0.0	20.9	1021	0.8	0									
BH201	WYGE 2004	Chalk	05/01/2006	0.0	0.1	20.1	1015	0.6	0	20/01/2006	0.1	0.3	21.3	1021	0.6	0									
BH7G	Soil Mechanics 2000	London Clay																							
BH204R	WYGE 2004	Lambeth Group	05/01/2006	0.0	0.1	20.0	1015	0.7	0	20/01/2006	0.0	0	19.9	1021	1	0									
LG401	VHE 2005	Made ground	05/01/2006	0.0	0.60	19.8	1015	0.8	0	20/01/2006	0.0	0.3	21.1	1021	0.9	0									
LG402	VHE 2005	Made ground	05/01/2006	0.0	0.4	20.0	1015	0.7	0	20/01/2006	0.0	0.0	19.7	1021	0.7	0									
LG403	VHE 2005	Made ground	05/01/2006	0.0	0.0	19.9	1015	0.9	0	20/01/2006	0.0	0.0	19.9	1021	0.6	0									
LG404	VHE 2005	Made ground	05/01/2006	0.0	0.2	19.9	1015	1.2	0	20/01/2006	0.0	0	19.7	1021	0.8	0									
LG405	VHE 2005	Made ground	05/01/2006	0.0	0.0	19.7	1015	0.6	0	20/01/2006	0.0	0.0	20.0	1021	0.9	0									
LG406	VHE 2005	Made ground	05/01/2006	0.0	0.0	20.9	1015	0.5	0	20/01/2006	0	0	21.6	1021	1.1	0									
LG407	VHE 2005	Made ground																							
LG408	VHE 2005	Made ground																							
LG409	VHE 2005	Made ground	05/01/2006	0.0	0.1	19.6	1015	0.6	0	20/01/2006	0.0	0.0	21.2	1021	0.9	0									
LG410	VHE 2005	Made ground	05/01/2006	0	0.1	19.8	1015	0.7	0	20/01/2006	0	0	20.4	1021	0.7	0									
BH506	VHE 2005	Alluvium	05/01/2006	0	0.1	19.4	1015	1.1	0	20/01/2006	0	0	20.6	1021	0.8	0									
BH507	VHE 2005	Alluvium	05/01/2006	0	0	21.9	1015	0.9	0	20/01/2006	0	0	19.3	1021	0.5	0									
BH508	VHE 2005	Alluvium	05/01/2006	0	0	20.8	1015	0.8	0	20/01/2006	0	0	19.8	1021	1.1	0									

Note: Week 35 and week 37 were monitored with an uncalibrated analyser

White Young Green Environmental

LANDGAS AND GROUNDWATER MONITORING RESULTS



Site Name: Reading STW Landgas Monitoring
 Job No.: E003015/579
 Equipment: GA2000 Gas Analyser with flow pod,

Date Sampled: 26th May 2006
 Monitoring Engineer: HB

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS									
Installation No.	CH ₄ %	CO ₂ %	O ₂ %	PID ppm	H ₂ S ppm	HCN ppm	CO	Time	Remarks
LG401	0.0	0.2	20.4	-	-	-	-		
LG402	0.0	0.0	21.0	-	-	-	-		casing bent
LG403				-	-	-	-		no gas tap, casing labelled GW, BH403 not LG403?
LG404	0.0	3.3	14.9	-	-	-	-		casing bent
LG405				-	-	-	-		gas tap not on
LG406				-	-	-	-		gas tap not on, casing bent
LG408	0.0	1.8	6.7	-	-	-	-		
LG409	0.0	0.2	17.6	-	-	-	-		no casing, pipe with tap sticking out of the ground
BH701	2.4	0.0	4.6	-	-	-	-		
BH702				-	-	-	-		gas tap open
BH505				-	-	-	-		borehole destroyed
BH506				-	-	-	-		gas tap not on
BH507				-	-	-	-		underwater
LG1002				-	-	-	-		gas tap open, casing bent
LG1003				-	-	-	-		borehole destroyed
LG1004				-	-	-	-		underwater
LG1005	0.0	0.0	16.8	-	-	-	-		
BH7G				-	-	-	-		no gas tap/ bent installation/ destroyed

LANDGAS - PHYSICAL PARAMETERS							
Installation No.	Atmos Pressure m bar	Atmos Temp °C	BH Flow		BH Pressure		Remarks
			High l/hr	Low l/hr	High mbar	Low mbar	
LG401	1010		0.0				
LG402	1010		0.0				
LG403							
LG404	1010		0.0				
LG405							
LG406							
LG408	1010		0.0				
LG409	1010		0.1				
BH701	1010		0.0				
BH702							
BH505							
BH506							
BH507							
LG1002							
LG1003							
LG1004							
LG1005	1010		0.0				
BH7G							

LANDGAS CONCENTRATIONS - AMBIENT CONDITIONS							
	CH ₄ %	CO ₂ %	O ₂ %	PID ppm	Atmos mbar	Weather Conditions	Remarks
Before Monitoring	0.0	0.0	20.8	-	1010.0	Overcast, some rain	
After Monitoring	0.0	0.0	21.0	-	1010.0	Overcast	

ATMOSPHERIC PRESSURE CONDITIONS					
3 days prior mbar	2 days prior mbar	1 day prior mbar	during mbar	1 day post mbar	Remarks
	1018	1017	1010	1023	

Calibration Equipment calibration details are available upon request

Data Compiled by: HB
 Data Checked by: PC

White Young Green Environmental

LANDGAS AND GROUNDWATER MONITORING RESULTS



Site Name: Reading STW

Job No.: E03015/579

Equipment: GA2000 Gas Analyser with flow pod, Single Phase Dipmeter, Photovac PID

Date Sampled: 23/06/2006

Monitoring Engineer: Steve Burden

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS									
Installation No.	Flow	CH ₄ %	CO ₂ %	O ₂ %	Pressure				
LG401	0.0	0.0	10.2	12.1	1014				
LG402	0.0	0.0	2.6	18.9	1014				
LG403	0.0	0.0	0.0	21.0	1014				See notes below
LG404	0.0	0.0	7.4	14.0	1015				See notes below
LG405	0.0	0.0	3.6	12.3	1015				
LG406	0.0	0.0	0.5	19.9	1015				
LG408	Could not find well,								
LG409	0.0	0.8	1.5	4.7	1014				
BH701	0.0	9.0	0.0	1.0	1014				
BH702	0.0	1.6	0.0	1.0	1014				
BH505	Could not find well, Possibly destroyed								
BH506	0.0	0.0	0.0	20.8	1014				
BH507	0.0	0.0	0.0	20.6	1014				
LG1002	0.0	0.0	2.1	15.1	1014				See notes below
LG1003	Could not find well								
LG1004	0.0	0.0	0.0	18.0	1014				See notes below
LG1005	0.0	0.0	0.0	12.0	1014				
BH7G	No installation in borehole								

Buildings

Block M

1	N/A	0.0	0.0	21.0	1014	
2	N/A	0.0	0.0	21.0	1014	
3	N/A	0.0	0.0	20.9	1014	
4	N/A	0.0	0.0	21.1	1014	

LANDGAS CONCENTRATIONS - AMBIENT CONDITIONS						
	CH ₄ %	CO ₂ %	O ₂ %	VOC ppm	Atmos mbar	Remarks
Before Monitoring	0.0	0.0	20.8		1014	
After Monitoring	0.0	0.0	21.0		1014	

ATMOSPHERIC PRESSURE CONDITIONS					
3 days prior mbar	2 days prior mbar	1 day prior mbar	during mbar	1 day post mbar	Remarks

Notes

- LG404 Top of valve damage, valve looks like its been squashed, as opening is now in an oval shape rather than round
- LG403 Has been re-installed, using flush type covers, looks reasonably new, may have affected results
- LG1002 Top of the well cover has been damaged, although has not affected actual well, it does not open full, making access difficult
- LG1004 Tap had been left open
- Block U1 Has not internal walls or partitions at the moment, site manager says that they will be installed by the next site visit

White Young Green Environmental

LANDGAS AND GROUNDWATER MONITORING RESULTS



Site Name: Reading STW

Job No.: E03015/579

Equipment: GA2000 Gas Analyser with flow pod, Single Phase Dipmeter, Photovac PID

Date Sampled: 21/07/2006

Monitoring Engineer: Edward Hiskins

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS							
Installation No.	CH ₄ %	CO ₂ %	O ₂ %	H ₂ S ppm	CO ppm	Depth m	Remarks
LG401	0.0	8.6	12.1	0	5		
LG402	0.0	1.8	18.7	0	4		
LG403	0.0	1.4	16.9	0	5		Gas Valve Missing
LG404	1.6	2.5	10.7	0	5	21.30	
LG404	0.0	0.0	19.6	0	7	22.30	
LG406	0.0	0.1	20.0	0	5		Gas tap left open
LG409	0.0	0.0	20.3	0	4		
LG505	0.0	2.0	18.1	0	6		
LG506	0.1	0.0	19.3	0	10		
LG507	0.0	0.5	19.3	0	7		
LG701	5.6	0.0	2.8	1	6		
LG702	0.6	0.0	1.8	0	6		
LG1004	0.0	0.0	18.4	0	8		
LG1005	0.0	0.0	15.0	0	5		

LANDGAS - PHYSICAL PARAMETERS				
Installation No.	Atmos Pressure m bar	Atmos Temp °C	BH Flow	Remarks
LG401	1016.0	N/T	-6.0	
LG402	1016.0	N/T	-5.9	
LG403	1016.0	N/T	-5.8	
LG404	1016.0	N/T	-5.7	
LG404	1016.0	N/T	-5.7	
LG406	1016.0	N/T	-5.8	
LG409	1016.0	N/T	-5.9	
LG505	1016.0	N/T	-5.7	
LG506	1016.0	N/T	-5.8	
LG507	1016.0	N/T	-5.9	
LG701	1016.0	N/T	-6.1	
LG702	1016.0	N/T	-6.0	
LG1004	1016.0	N/T	-5.6	
LG1005	1016.0	N/T	-5.5	

LANDGAS CONCENTRATIONS - AMBIENT CONDITIONS						
	CH ₄ %	CO ₂ %	O ₂ %	CO ppm	Atmos mbar	Remarks
Before Monitoring	0.0	0.0	20.0	3.0	1016.0	
After Monitoring	0.0	0.0	20.0	3.0	1016.0	

ATMOSPHERIC PRESSURE CONDITIONS					
3 days prior mbar	2 days prior mbar	1 day prior mbar	during mbar	1 day post mbar	Remarks
1020	1015.0	1016.0	1020/1019/1017	1014.0	

Calibration Internal and External Calibration Details (available upon request)

Data Compiled by:

P:\Projects\E003000\E03015\Consulting\E03015 Reading Gateway\EAST SITE\DERC\Validated Data

Data Checked by:

White Young Green Environmental

LANDGAS AND GROUNDWATER MONITORING RESULTS



Site Name: Reading STW

Job No.: E03015/579

Equipment: GA2000 Gas Analyser with flow pod

Date Sampled: 22/08/2006

Monitoring Engineer: Tim Conibear

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS						
Installation No.	CH ₄ %	CO ₂ %	O ₂ %	Atmos Pressure m bar	BH Flow	Remarks
LG401	0.0	3.8	17.3	1014	0	
LG402	0.0	3.6	18.0	1014	0	
LG403	0.0	0.6	18.9	1014	0	Gas Valve Missing
LG404	0.0	7.8	11.8	1014	0	
LG405	0.0	7.3	10.5	1015	0	
LG406	0.0	0.6	19.5	1016	0	
LG408	-	-	-	-	-	LOST
LG409	0.0	0.0	20.1	1014	0	
LG1002	0.0	4.2	10.5	1014	0	
LG1004	0.0	0.2	19.6	1014	0	
LG1005	0.0	0.0	15.7	1014	0	
BH404a	0.0	0.0	20.2	1014	0	
BH404b	0.0	1.5	14.5	1014	0	
BH405	0.0	0.0	20.1	1015	0	
BH506	0.0	3.0	11.1	1014	0.2	
BH507	0.0	0.4	18.4	1014	0	
BH701	2.3	0.3	9.7	1014	0	
BH702	0.7	0.0	1.4	1014	0	

LANDGAS CONCENTRATIONS - AMBIENT CONDITIONS					
	CH ₄ %	CO ₂ %	O ₂ %	Atmos mbar	
Before Monitoring	0.0	0.0	20.3	1015	
After Monitoring	0.0	0.0	20.7	1013	

ATMOSPHERIC PRESSURE CONDITIONS					
3 days prior mbar	2 days prior mbar	1 day prior mbar	during mbar	1 day post mbar	Remarks
1008	1016	1015	1020 / 1019 / 1017	1013	

Calibration Internal and External Calibration Details (available upon request)

Data Compiled by:

Data Checked by:

Tim Conibear

White Young Green Environmental

LANDGAS AND GROUNDWATER MONITORING RESULTS



Site Name: Reading STW

Job No.: E03015/579

Equipment: GA2000 Gas Analyser with flow pod

Date Sampled: 25/09/2006

Monitoring Engineer: Tim Conibear

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS						
Installation No.	CH ₄ %	CO ₂ %	O ₂ %	Atmos Pressure m bar	BH Flow	Remarks
LG401	0.0	3.2	17.4	1003	0.2	
LG402	0.0	3.2	18.0	1003	0.0	
LG403	0.0	1.1	17.5	1004	0.0	Gas Valve Missing
LG404	0.0	0.2	20.2	1004	0.0	
LG405	0.0	0.0	20.5	1004	0.0	
LG406	0.0	0.9	19.3	1005	0.0	
LG408	-	-	-	-	-	LOST
LG409	0.0	0.2	20.0	1004	0.0	
LG1002	0.0	0.0	20.5	1004	0.0	
LG1004	0.0	0.2	20.2	1004	0.0	
LG1005	0.0	0.0	20.5	1004	0.0	
BH404a	0.0	0.1	20.2	1003	0.0	
BH404b	0.0	0.9	16.8	1003	0.0	
BH405	0.0	0.1	20.5	1005	0.1	
BH506	0.0	0.0	20.5	1004	0.0	
BH507	0.0	0.0	20.5	1004	0.0	
BH701	0.2	0.6	2.1	1004	0.0	
BH702	2.1	0.0	1.9	1004	0.0	

LANDGAS CONCENTRATIONS - AMBIENT CONDITIONS					
	CH ₄ %	CO ₂ %	O ₂ %	Atmos mbar	
Before Monitoring	0.0	0.0	20.6	1004	
After Monitoring	0.0	0.0	20.5	1005	

ATMOSPHERIC PRESSURE CONDITIONS					
3 days prior mbar	2 days prior mbar	1 day prior mbar	during mbar	1 day post mbar	Remarks
1004	1008	1005	1007 / 1008 / 1010	1017	

Calibration Internal and External Calibration Details (available upon request)

Data Compiled by:

Tim Conibear

Data Checked by:

White Young Green Environmental

LANDGAS AND GROUNDWATER MONITORING RESULTS



Site Name: Reading STW
 Job No.: E03015/579
 Equipment: GA94 Gas Analyser with flow pod

Date Sampled: 24/10/2006
 Monitoring Engineer: Tim Conibear

LANDGAS CONCENTRATIONS - INSTALLATION CONDITIONS						
Installation No.	CH ₄ %	CO ₂ %	O ₂ %	Atmos Pressure m bar	BH Flow	Remarks
LG401	0.0	1.1	18.9	989	0.0	
LG402	0.0	1.1	18.2	989	0.0	
LG403	0.0	0.0	19.9	989	0.0	Gas Valve Missing
LG404	0.0	1.1	17.6	990	0.0	
LG405	0.0	0.0	20.1	989	N/T	Bung missing
LG406	-	-	-	-	-	Unable to locate
LG408	-	-	-	-	-	Unable to locate
LG409	0.0	18.3	2.1	987	N/T	Installation flooded
LG1002	-	-	-	-	-	Unable to locate
LG1004	-	-	-	-	-	Location flooded
LG1005	0.0	0.0	20.1	990	0.0	
BH404a	0.0	0.3	19.3	989	0.0	
BH404b	0.0	3.0	7.1	989	0.0	
BH405	0.0	0.0	20.1	989	N/T	Bung missing
BH506	0.0	0.0	20.2	988	1.6	
BH507	6.4	0.0	15.8	988	0.0	
BH701	0.8	0.0	19.5	988	0.0	
BH702	8.3	0.0	0.6	988	-2.4	

LANDGAS CONCENTRATIONS - AMBIENT CONDITIONS					
	CH ₄ %	CO ₂ %	O ₂ %	Atmos mbar	
Before Monitoring	0.0	0.0	20.3	987	
After Monitoring	0.0	0.0	20.4	990	

ATMOSPHERIC PRESSURE CONDITIONS					
3 days prior mbar	2 days prior mbar	1 day prior mbar	during mbar	1 day post mbar	Remarks
995	992	994	988 / 1000 / 1005	1001	

Calibration Internal and External Calibration Details (available upon request)

Data Compiled by: Tim Conibear
 Data Checked by:



Appendix D

St James Specification of Works

~~40mm TIMBER FRAME CONSTRUCTION~~

Robert Rigby Architects
12 Portman Road, Reading, Berks RG30 1EB
Telephone: 0115 9594932 Fax: 0118 9577070
enquiries@robbyarchitects.co.uk
E-Mail: enquiries@robbyarchitects.co.uk

CONSTRUCTION ISSUE

St JAMES

**SOUTHSIDE MANOR FARM
KENNET ISLAND
PHASE 6**

FOR
ST JAMES GROUP LTD

**BLOCK N3, P3 & P4
TYPICAL GROUND FLOOR
EXTERNAL WALL JUNCTION
DETAIL - BRICKWORK**

1:10 @ A3

1196

15

12 Portman Road, Reading, Berkshire RG30 1EA
Telephone: 0118 9594932 Fax: 0118 9577019
E-Mail: enquiries@indivarchitects.com

Applicable to:

Plots:	434-441
Plots:	443
Plots:	448
Plots:	451
Plots:	453-459
Plots:	463-464
Plots:	471
Plots:	474-475
Plots:	476-477
Plots:	482
Plots:	487
Plots:	491, 494
Plots:	495-501
Plots:	503
Plots:	506-513

EXWT
2

Ground Floor Construction:
75mm thick reinforced concrete screed on
75mm thick Kingspan Kooltherm K3 insulation board over
2000 gauge polythene DPM all over
150mm concrete beam and block floor construction over a 150mm
ventilated sub floor void.

[illegible]

Ensure stainless steel stop bead provision to render as shown. Facing brickwork to DPC level. Render demise line to start from DPC level upwards.

~~-Engineering Class B brick or equivalent below DPC level~~~~Weak mix concrete fill~~

Beam and Block floor size, position and direction of span shown as indicative only. Please refer to appointed Structural Engineers drawing information for full details.

Foundation in accordance with engineer's separate design and detail drawings (shown as indicative only)

CONSTRUCTION ISSUE

SUBJECT INDEX



ST JAMES
GROUP LTD

**SOUTHSIDE MANOR FARM
KENNET ISLAND
PHASE 2 AFFORDABLE**

FOR
ST JAMES GROUP LTD

TYPICAL GROUND FLOOR
EXTERNAL WALL JUNCTION
DETAIL - RENDER

1:10 at A3	JUL 08
------------	--------

1096	701	.
------	-----	---

robert RUMBY Architects
42 Parkman Road, Reading, Berks RG3 7JH
Telephone/Fax 0118 959 1111
E-mail enquiries@rbyarchitect.co.uk

Gas membrane key
1. Zedex cavity tray.
2. Vaqueen double sided tape
3. Zedex DPC
4. Vaqueen girth joining tape
5. Vaqueen radon membrane

NOTE:
Gas membrane detail show as recommended by VASQUEEN. Install membrane as recommended by chosen membrane manufacturer.

CONSTRUCTION ISSUE

ST JAMES GROUP LTD

SOUTHSHORE MANOR FARM
KENNET ISLAND
PHASE 2 AFFORDABLE

FOR
ST JAMES GROUP LTD

TYPICAL GROUND FLOOR
LEVEL THRESHOLD
DETAIL - GAS MEMBRANE

1:10 at A3

108.08

1096

705

ROBERT LADBY ARCHITECTS

42 Parkway Road, Reading, RG2 9AT
Tel: 0118 986 1000
Email: info@robertladby.co.uk
www.robertladby.co.uk

Floor Membranes -
DPC's lapped and sealed to DPM (2000 gauge) all around and in all cases, with service entry points sealed vented void beneath suspended floor construction

Ensure provision for additional DPC positioned between insulation and inner face of outer leaf.

4.5mm Rigid board insulation Celotex C10/2000 continued down to bottom of beam and block floor

102.5mm brickwork to suit

Ensure provision for additional DPC positioned within inner skin where beam and block floor is built into wall.

Ground Floor Construction:
75mm thick reinforced concrete screed on
75mm thick Kingspan footherm K3 insulation board over
2000 gauge polythene DPM all over
150mm concrete beam and block floor construction over a 150mm ventilated sub floor void

Barr and Block floor size, position and direction of span shown as indicative only. Please refer to appropriate Structural Engineers drawing information for full details.

Foundation in accordance with engineer's separate design and detail drawings (shown as indicative only)



Appendix E

WYG Site Photographs of Soft Landscaping & Layout Plans



Block O3 managed soft landscaping 4th October 2011

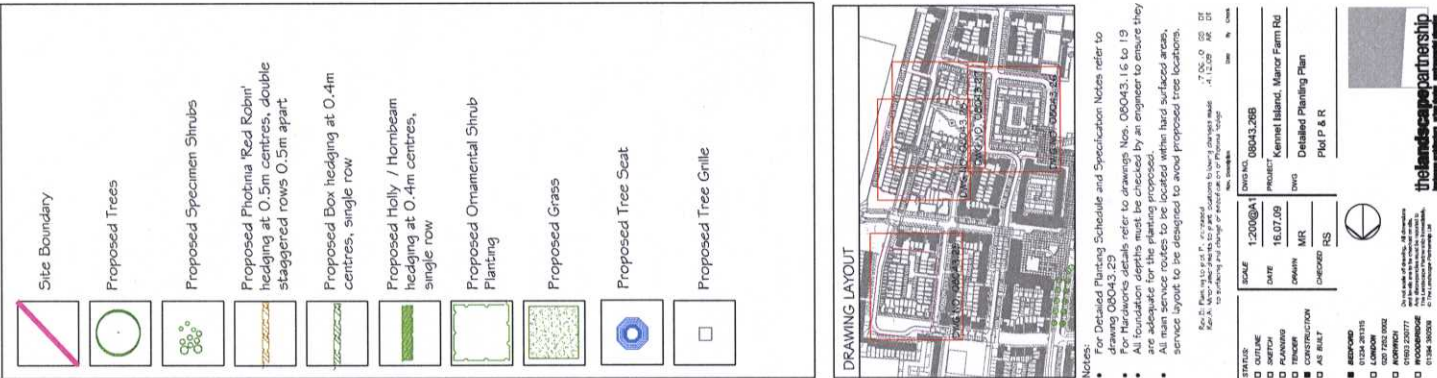


Block R soft landscaping 4th October 2011



Block R soft landscaping 4th October 2011

SCALE 1:200 @ A1



Refer to drawing 08043.09 for Landscape Proposals for Podium Deck - to be detailed

DRAWING LAYOUT

Notes:

- For Detailed Planting Schedule and Specification Notes refer to drawing 08043.29
- For Hardwork's details refer to drawings Nos. 08043.16 to 19
- All foundation depths must be checked by an engineer to ensure they are adequate for the planting proposed.
- All main service routes to be located within hard surfaced areas, service layout to be determined around environmental tree locations.

Rev B. Plating to p. 17, increased
Rev A. Wrote amendments to p. 17, citations to law, changes made
to surface and change of entries on p. 17, Plasma bridge

[illegible]



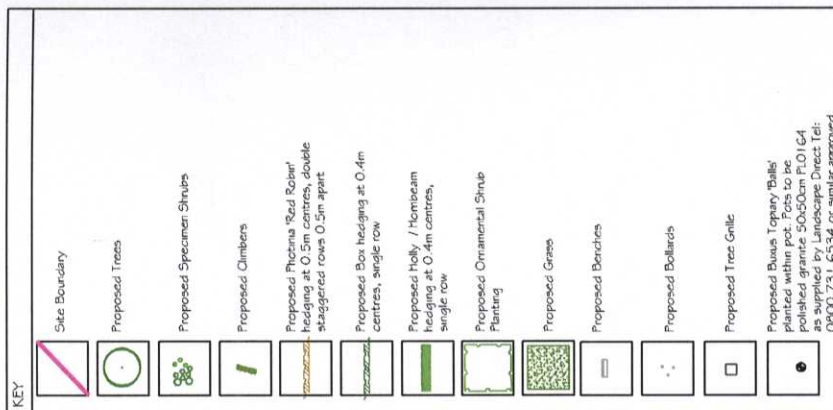
KEY		Site Boundary
		Proposed Trees
		Proposed Specimen Shrubs
		Proposed Climbers
		Proposed Photinia 'Red Robel' hanging at 0.5m centres, double staggered rows 0.5m apart
		Proposed Box hedging at 0.4m centres, single row
		Proposed Holly / Honeysuckle hedging at 0.4m centres, single row
		Proposed Ornamental Shrub Planting
		Proposed Grass
		Proposed Broken Court surface - 50mm Depth Breccia gravel, colour graded
		Proposed Tree Base
		Proposed Benches
		Proposed Bollards
		Proposed Tree Circle
		Proposed Busstop Topography 'Isle'

as supplied by Landscape Direct Ltd: 0800 751 6534 or similar approved

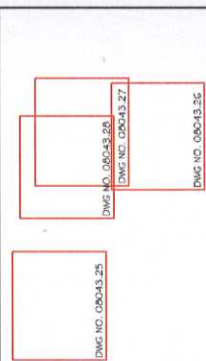


Notes:
For Detailed Pricing Schedule and Specification Notes refer to drawing 08043.29
For Hardness details refer to drawings Nos. 08043.16 to 19
All foundation details must be checked by an engineer to ensure they are adequate for the piling proposed.
All service routes to be located within hard surfaced areas, service layout to be determined from location of existing services.

[illegible]

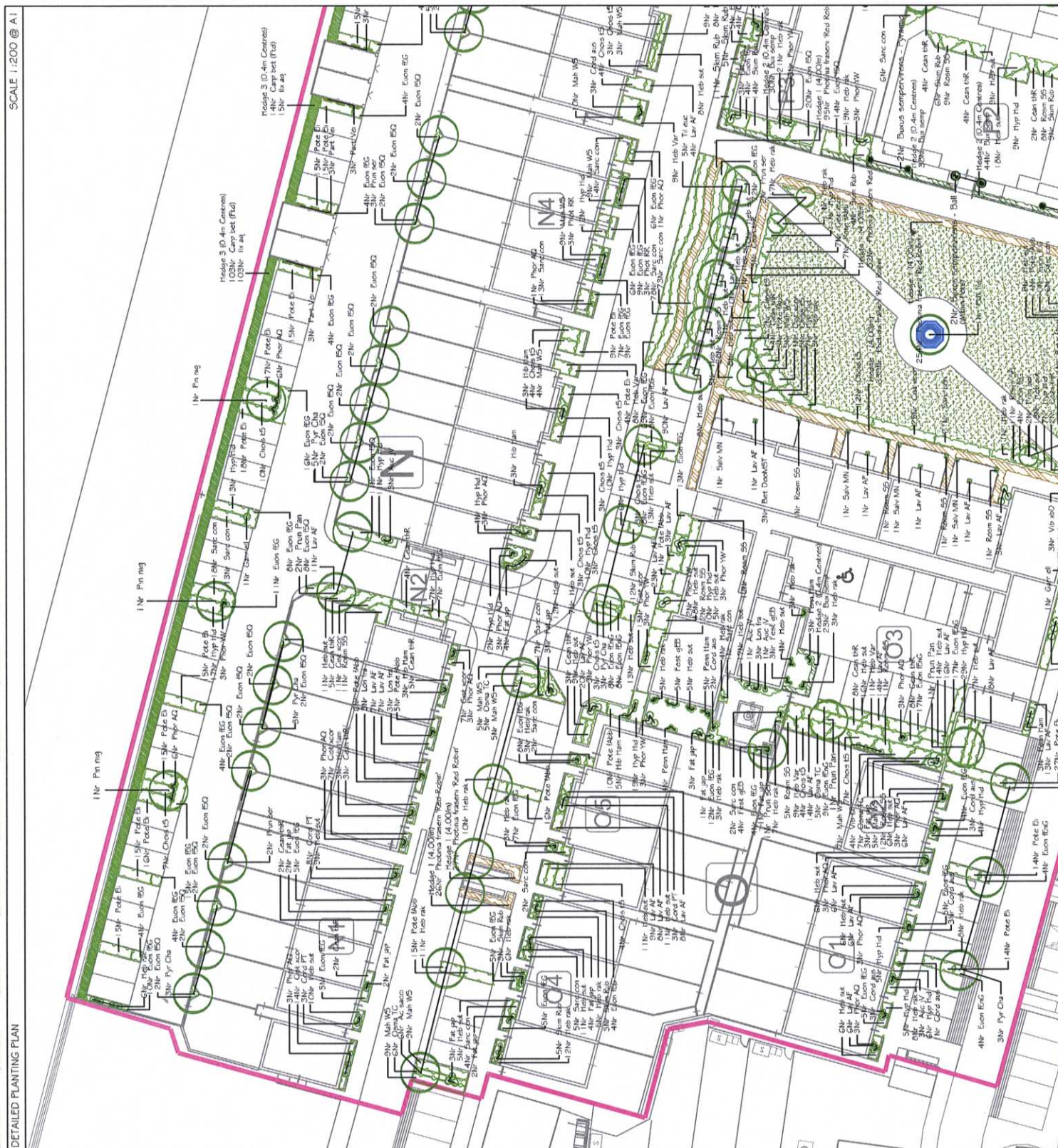


DRAWING LAYOUT



Notes:

- For Detailed Planting Schedule and Specification Notes refer to drawing OBO43.29
- For Hardwoods details refer to drawings Nos. OBO43.16 to 19
- All foundation depths must be checked by an engineer to ensure they are adequate for the planting proposed.
- All main service routes to be located within hard surfaced areas.

[illegible]

SPECIFICATION NOTES

All main service routes to be located within hard surfaced areas.

All areas of proposed planting/turfing to be cleared of: building debris, stones, brick and concrete over 50mm in diameter; contamination; and soils unsuitable for landscape purposes on housing developments. These should be removed from site. All areas of proposed planting/turfing affected by construction works to be relieved of compaction by stripping to a depth of 600mm at 1m centres. In two directions, except below the canopies of existing trees and where underground services exist or where directed not to by on site engineers.

BS 3882 (2007) Specification for topsoil and requirements for use
BS 3969 (1998) Recommendations for Turf for General Purposes

contaminants as previously guided by ICBC, in accordance with CLEA (levels to meet the requirements of Residential without Plant Uptake), and for other

All plants shall be supplied in accordance with the National Plant Specification, by nurseries accredited by the Horticultural Trade Association.

Tenacelli, Jennifer L. 2006.

150mm grass areas;
450mm for shrub areas;
600mm for trees;

hedgerow to be planted in a 1.0m wide cultivated strip 300mm deep.

Apply peat-free tree and shrub planting compost with moisture retaining elements by thoroughly incorporating it with topsoil into planting holes at the ratio of 8 litres per shrub / 40 litres per tree.

All plants to be watered before and after planting and as necessary during the growing season to ensure planting thrives.

All trees to have 80mm dia. 30% perforated flexible drainage pipe placed around outer edge of rootball and brought up to 100mm above ground level for irrigation. All pipes to be fitted with dirt stoppers. Trees shall be watered directly over the rootball during the first growing season, then subsequently years using watering pipe.

All trees to be underground guyed, using platypus tree anchoring system or similar.

Surface Mulching to all plant beds and for 500mm radius around individual trees shall be 75mm depth of ornamental bark mulch, approved by the contractor, well composted for 180 days and free from fungus, disease and debris.

Turf to be Rowdawn Medalion or similar approved by the Contract Administrator.

Maintenance shall be carried out to keep all planting areas weed free and any dead, diseased or seriously damaged plants (including those vandalised) shall be replaced during the following planting season during the 5 year Maintenance Period. These are to be replaced with plants of similar sizes and species to that originally specified. Much to planting beds shall be topped up annually to maintain 75mm depth and regular sweep up from surrounding paved areas.

Maintenance shall be carried out regularly to all proposed grass areas. Mowing operations shall be carried out to maintain a height of 30mm max.

Phloxina fraseri 'Red Robur' (Hedge '1) to be planting in a cultivated strip 1m wide. Plants to be planted in a double staggered row at 0.5m centres, rows 0.5m apart.

☐ HEMLOCK
 0000 0542 000
☐ INCENSE 7

[illegible]



Appendix F

Chemical Analysis of Re-Used Soils

Hillary Bennett
White Young Green Environmental
Yeoman House
63 Croydon Road
London
SE20 7TS

7-Aug-2006

Telephone: 0208 659 9959
Fax: 0208 676 9968

Report Number: 7788

Your Order No. 12161

Instructions dated: 27-Jul-2006

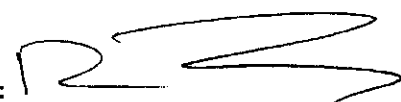
Date Sampled:

Soil samples	17
Water Samples	0
Other Samples	0

Project Name: Reading STW

Project Code: E03015

Date Received	27-Jul-2006
Time Received:	14:00

Signed: 

For & on behalf of i2 analytical ltd

Signed: 

For & on behalf of i2 analytical ltd

Les Jones	Managing Director
Kevin Old	Laboratory Manager
Russell Jarvis	Commercial Manager
Chris Ives	Quality Manager
Nick Watson	Technical Manager
Jeremy Webb	Asbestos Manager

Authorised By:








i2 analytical ltd.
brunel science park, uxbridge,
middlesex, ub8 3pq

t: 01895 81 23 23
f: 01895 81 24 24
www.i2analytical.com

**White Young Green Environmental
7788 - Reading STW (E03015)**

* Date Sampled		21/07/2006	21/07/2006	21/07/2006	21/07/2006
* Lab Ref. No:		i2 60824	i2 60825	i2 60826	i2 60827
* Customer Ref. No.		TP1	TP1	TP2	TP2
* Sample Type		Soil	Soil	Soil	Soil
* Trial Pit / Borehole No.					
* Depth (m)		1.00	4.00	2.00	4.00
* Hardstanding at Surface (Y/N)					
* Asbestos	%	<0.001	<0.001	<0.001	<0.001
* US EPA PRIORITY PAH's					
* Benzo(a)pyrene	mg/kg	0.26	0.11	0.12	<0.05
* HEAVY METALS/METALLOIDS					
* Arsenic	mg/kg	11	<10	<10	<10
* Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5
* Chromium (Total)	mg/kg	22	15	19	20
* Mercury	mg/kg	<0.3	<0.3	<0.3	<0.3
* Nickel	mg/kg	14	10	11	12
* MISCELLANEOUS					
* Ammonia	mg/kg	<5	5.9	<5	<5



**White Young Green Environmental
7788 - Reading STW (E03015)**

Date Sampled		21/07/2006	21/07/2006	21/07/2006	21/07/2006
Lab Ref. No:		i2 60828	i2 60829	i2 60830	i2 60831
Customer Ref. No.		TP2	TP3	TP3	TP4
Sample Type		Soil	Soil	Soil	Soil
Trial Pit / Borehole No.					
Depth (m)		5.00	2.00	4.00	1.00
Hardstanding at Surface (Y/N)					
Asbestos	%	<0.001	<0.001	<0.001	<0.001
US EPA PRIORITY PAH's					
Benzo(a)pyrene	mg/kg	<0.05	0.16	0.05	0.12
HEAVY METALS/METALLOIDS					
Arsenic	mg/kg	<10	<10	<10	<10
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5
Chromium (Total)	mg/kg	36	18	26	13
Mercury	mg/kg	<0.3	<0.3	<0.3	<0.3
Nickel	mg/kg	<5	9.9	5.3	8.7
MISCELLANEOUS					
Ammonia	mg/kg	5.7	<5	<5	<5



**White Young Green Environmental
7788 - Reading STW (E03015)**

Date Sampled		21/07/2006	21/07/2006	21/07/2006	21/07/2006
Lab Ref. No:		i2 60832	i2 60833	i2 60834	i2 60835
Customer Ref. No.		TP4	TP5	TP6	TP6
Sample Type		Soil	Soil	Soil	Soil
Trial Pit / Borehole No.					
Depth (m)		3.00	1.00	1.00	2.00
Hardstanding at Surface (Y/N)					
Asbestos	%	<0.001	<0.001	<0.001	<0.001
US EPA PRIORITY PAH's					
Benzo(a)pyrene	mg/kg	0.08	0.37	<0.05	0.13
HEAVY METALS/METALLOIDS					
Arsenic	mg/kg	<10	11	11	12
Cadmium	mg/kg	<0.5	0.76	<0.5	<0.5
Chromium (Total)	mg/kg	18	25	29	20
Mercury	mg/kg	<0.3	<0.3	<0.3	<0.3
Nickel	mg/kg	9.9	13	15	15
MISCELLANEOUS					
Ammonia	mg/kg	<5	<5	6.4	<5



**White Young Green Environmental
7788 - Reading STW (E03015)**

Date Sampled		21/07/2006	21/07/2006	21/07/2006	21/07/2006
Lab Ref. No:		i2 60836	i2 60837	i2 60838	i2 60839
Customer Ref. No.		TP6	TP7	TP7	TP8
Sample Type		Soil	Soil	Soil	Soil
Trial Pit / Borehole No.					
Depth (m)		4.00	1.00	3.00	1.00
Hardstanding at Surface (Y/N)					
Asbestos	%	<0.001	<0.001	<0.001	<0.001
US EPA PRIORITY PAH's					
Benzo(a)pyrene	mg/kg	0.06	0.06	0.17	0.19
HEAVY METALS/METALLOIDS					
Arsenic	mg/kg	<10	<10	<10	11
Cadmium	mg/kg	<0.5	<0.5	<0.5	<0.5
Chromium (Total)	mg/kg	19	16	12	20
Mercury	mg/kg	<0.3	<0.3	<0.3	<0.3
Nickel	mg/kg	10	9.2	7.6	11
MISCELLANEOUS					
Ammonia	mg/kg	<5	<5	<5	<5



**White Young Green Environmental
7788 - Reading STW (E03015)**

Date Sampled	21/07/2006
Lab Ref. No:	i2 60840
Customer Ref. No.	TP8
Sample Type	Soil
Trial Pit / Borehole No.	
Depth (m)	2.00
Hardstanding at Surface (Y/N)	

Asbestos	%	<0.001
----------	---	--------

US EPA PRIORITY PAH's

Benzo(a)pyrene	mg/kg	0.11
----------------	-------	------

HEAVY METALS/METALLOIDS

Arsenic	mg/kg	<10
Cadmium	mg/kg	<0.5
Chromium (Total)	mg/kg	23
Mercury	mg/kg	<0.3
Nickel	mg/kg	11

MISCELLANEOUS

Ammonia	mg/kg	<5
---------	-------	----



24 January 2008

Hillary Bennett
Senior Environmental Scientist
White Young Green Environmental
Swinley House
Bedford Park
Croydon
Surrey CR0 2AP

Dear Hillary

Re: Kennet Island - Reading

Please find enclosed letter from Wooldridge in respect of the use of previously tested fill material.

Yours sincerely



Terry Stone
Technical Manager
Thames Valley Region



INVESTOR IN PEOPLE

St James Group Ltd **Thames Valley** St James House Commercial Road Reading Berkshire RG2 0QZ

Tel 01189 879 000 Fax 01189 879 040 stjameshomes.co.uk

Registered Office St James Group Ltd 19 Portsmouth Road Cobham Surrey KT11 1JG Registered in England number 3190056

22 January 2008.

F.A.O John White

St James Homes
St James House
Commercial Road
Reading, Berkshire
RG2 0QZ



Wooldridge Contractors Limited

Unit 17
Hall Grove Farm
Bagshot
Surrey GU19 5HP

Telephone: 01276 470321
Facsimile: 01276 470301

Dear John

Re : Manor Farm Road, Reading.

Further to our telephone conversation yesterday we can confirm that the general site won fill material used in areas M, U¹, U², H & T was taken from the stock pile which had been previously tested for contaminants and found to be non-hazardous.

It is also worth noting that this was the only material available at the time for this purpose.

The stock pile of this material was located adjacent to the site entrance from Manor Farm Road behind the security hut.

Yours sincerely,

A handwritten signature in black ink, appearing to be 'Melvyn Sexton', written over a large, stylized, handwritten 'X' or 'A' shape.

Melvyn Sexton

1 August 2008

Hillary Bennet
White Young Green Environmental
Sumley House
4 Bedford Park
Croydon
Surrey CR0 2AP

Dear Hillary

Re: Kennet Island - Reading

Please find enclosed copy of the soil test results, undertaken on 18th July prior to placing of material.

Yours sincerely



Terry Stone
Technical Manager
Thames Valley Region



INVESTOR IN PEOPLE

St James Group Ltd **Thames Valley** St James House Commercial Road Reading Berkshire RG2 0QZ

Tel 01189 879 000 Fax 01189 879 040 stjameshomes.co.uk

Registered Office St James Group Ltd 19 Portsmouth Road Cobham Surrey KT11 1JG Registered in England number 3190056

ALcontrol Laboratories Table Of Results

Project Name: Soil Test Reading Manor Farm Rd
Client : Wooldridge Contractors Ltd

Our Report Number: 06-43905a Reference No. 1 dated 30.07.2008

Matrix : Soil

Sample Reference	A								
Sample Depth (m)	-								
Date Sampled	18/07/08								
Date Scheduled	18/07/08								
Laboratory Reference No	328776								
Moisture Content (Dry Weight)	9.8							%	0.1
Moisture Content (Wet Weight)	9.0							%	0.1
Arsenic	10					069S TM	mg/kg		3
Boron (W/S)	0.7					016S TM	mg/kg		0.5
Cadmium	0.6					069S TM	mg/kg		0.5
Chromium	14					069S TM	mg/kg		10
Chromium (Hexavalent)	< 10					007S	mg/kg		10
Copper	40					069S TM	mg/kg		5
Lead	95					069S TM	mg/kg		10
Mercury	< 0.6					069S TM	mg/kg		0.6
Nickel	7.9					069S TM	mg/kg		4
Selenium	< 2.5					069S TM	mg/kg		2.5
Sulphate (Total Acid Soluble) as SO ₄	860					025a TM	mg/kg		200
Zinc	100					069S TM	mg/kg		10
Free Cyanide	< 1					061S TM	mg/kg		1
Total Cyanide	< 1					061S TM	mg/kg		1
pH	8.8					084S TM	pH Units		1
Acid Soluble Sulphide	< 10					008 TM	mg/kg		10
Thiocyanate as SCN	< 5					061S TM	mg/kg		5
Elemental Sulphur	< 100					032 TM	mg/kg		100
Naphthalene	< 0.5					022R TM	mg/kg		0.5
Benzo(a)pyrene	1.5					022R TM	mg/kg		0.5
Rapid PAH (Total 16)	20.97					022R ¹	mg/kg		2
Phenol	< 0.1					020S TM	mg/kg		0.1
Total Monohydric Phenols	< 1					020S ¹	mg/kg		1

¹ ISO 17025 accredited.

² MCERTS accredited for sand, loam and clay.



Appendix G

Chemical Analysis of Imported Topsoil



Melvyn Sexton
Wooldridge Contractors Ltd
Hall Grove Farm
Bagshot
Surrey
GU19 5HP

03 July 2009

TEST REPORT

Our Report Number: 09-64878

Your Order Reference: N/A

1 soil sample received on 25/06/2009

Final instructions received on 25/06/2009

Project Name: Membridge Garden Centre

Laboratory analysis started on 25 June 2009

All laboratory analysis completed by 03 July 2009

Rexona Rahman
Analytical Reporting Manager
ALCONTROL LABORATORIES

Daljit Jandu
Project Co-Ordinator
ALCONTROL LABORATORIES

This test report shall not be reproduced, except in full, without written approval of the laboratory.

Results contained herein relate only to the samples tested. 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 Laboratories

Table Of Results

Job Number : 09-64878
Matrix : Soil

Project Name: Membridge Garden Centre
Client : Wooldridge Contractors Ltd

Sample Reference	Soil Sample					Method No	Units	LOD
Sample Depth (m)	-							
Date Sampled	-							
Date Scheduled	25/06/09							
Laboratory Reference No	387680							
Analysis								
Moisture Content (Dry Weight)	2.4					021	%	0.1
Moisture Content (Wet Weight)	2.4					021	%	0.1
Arsenic	12					069S TM	mg/kg	3
Boron (W/S)	0.7					016S TM	mg/kg	0.5
Cadmium	< 0.5					069S TM	mg/kg	0.5
Chromium	16					069S TM	mg/kg	10
Chromium (Hexavalent)	< 10					007S	mg/kg	10
Copper	16					069S TM	mg/kg	5
Lead	100					069S TM	mg/kg	10
Mercury	< 0.6					069S TM	mg/kg	0.6
Nickel	7.4					069S TM	mg/kg	4
Selenium	< 2.5					069S TM	mg/kg	2.5
Sulphate (Total Acid Soluble) as SO ₄	810					025a TM	mg/kg	200
Zinc	87					069S TM	mg/kg	10
Free Cyanide	< 1					061S TM	mg/kg	1
Total Cyanide	< 1					061S TM	mg/kg	1
pH	8.3					084S TM	pH Units	1
Acid Soluble Sulphide	< 10					008 TM	mg/kg	10
Thiocyanate as SCN	< 5					061S TM	mg/kg	5
Elemental Sulphur	< 100					032 TM	mg/kg	100
** RAPID PAH SUITE **								
Naphthalene	< 0.5					022R TM	mg/kg	0.5
Benzo(a)pyrene	0.89					022R TM	mg/kg	0.5
Rapid PAH (Total 16)	8.96					022R TM	mg/kg	2
** PHENOLS SUITE **								
Phenol	< 0.1					020S TM	mg/kg	0.1
Total Monohydric Phenols	< 1					020S TM	mg/kg	1

[†] ISO 17025 accredited.

^{*} MCERTS accredited for sand, loam and clay.

ALcontrol Laboratories

Table Of Results - Appendix

Job Number : 09-64878

Project Name: Membridge Garden Centre
Client : Wooldridge Contractors Ltd

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
022R	In-house method	Determination of PAH compounds in soil samples by hexane / acetone extraction followed by GC-MS detection [Note: this method does not separate benzo(j)fluoranthene, and this PAH will be included in the sum of benzo(b)fluoranthene & benzo(k)fluoranthene]	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 MEVAM "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
084S	In-house method based on 1) Method 2510, "Standard Methods for the Examination of Water and Waste Water", APHA AWWA WEF, Edition 18, 1992 and 2) BS1377 Part 3, "Chemical and Electrochemical Tests", 1990	Determination of electrical conductivity, pH and temperature of 5:1 de-ionised water to soil extracts using corresponding probes.	D
069S	In-house method based on MEVAM "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
032	In-house method	Determination of elemental sulphur (with simultaneous PAH screening) by dichloromethane extraction followed by HPLC-UV detection	D
025a	In-house method based on BS1377 Part 3, "Chemical and Electrochemical Tests", 1990	Determination of hydrochloric acid soluble sulphate in soil samples by Inductively Coupled Plasma - Optical Emission Spectrometry (ICP-OES)	D
016S	In-house method	Determination of water soluble boron by 2:1 extraction in hot water followed by ICP-OES detection	D

ALcontrol Laboratories

Table Of Results - Appendix

Job Number : 09-64878

Project Name: Membridge Garden Centre
Client : Wooldridge Contractors Ltd

Summary of methods contained within report :			Wet/Dry Analysis
Method No.	Reference	Description	
007S	In-house method based on Method 3500-Cr, "Standard Methods for the Examination of Water and Waste Water", APHA AWWA WEF, Edition 18, 1992	Determination of hexavalent chromium in soil samples by water extraction and colorimetric detection	D

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.

Appendix

Code	Description
On Results	
*	Detection limit(s) raised due to matrix interference
¥	Detection limit(s) raised due to reduced amount of sample available for analysis
‡	Dilution factor applied due to nature of sample
NSM	No suspect material detected This must not be interpreted as a statement that there is no asbestos in the sample as loose fibres may not be found during visual screening
\$	Analysis sub-contracted
U/S	Analysis unsuitable for sample due to its matrix or properties
I/S	Insufficient sample
M/S	Sample cannot be located within the laboratory
ND	Not detected (below relevant analytical detection limit)
¢	Sample filtered prior to analysis
§	Please note product present, therefore this result is for indicative purpose only
On the Sample Numbers	
†	Sample type outside the scope of our MCERTS accreditation since matrix not included in method validation
¢	Unsuitable for analysis due to asbestos content
General Statements	
æ	Please note TOC's & LOI's have been repeated and the apparently anomalous results confirmed
¶	UKAS and/or MCERTS accreditation removed due to duration of sample in laboratory prior to testing
◻	The BOD analysis was carried out prior to the COD analysis and included an oily layer, which is the likely cause of the anomalous results
Note:	Analysis carried out for organic compounds on water samples containing free product is on a "best endeavour" basis
Note:	All results calculated from organic carbon on a dry weight basis
Note:	Fe(II) and dissolved Fe are analysed by different methods, sometimes leading to slight discrepancy between results
Note:	"Total" results calculated by summing individual components are not rounded
Note:	The reporting limit stated in the LOD column is the standard method reporting limit, derived statistically from validation data, however it is occasionally necessary to raise reporting limits due to matrix interference or limited sample availability
Note:	During soil preparation, best efforts are made to produce analytical subsamples representative of the entire submitted sample, without exclusion of stones

2

ALcontrol Laboratories Table Of Results

Job Number : 09-63338
Matrix : Soil

Client : Wooldridge Contractors Ltd

Sample Reference	Sample A					Method No	Units	LOD
Sample Depth (m)	-							
Date Sampled	-							
Date Scheduled	11/05/09							
Laboratory Reference No	380751							
Analysis								
Moisture Content (Dry Weight)	9.8					021	%	0.1
Moisture Content (Wet Weight)	8.9					021	%	0.1
Arsenic	13					069S TM	mg/kg	3
Boron (W/S)	< 0.5					016S TM	mg/kg	0.5
Cadmium	< 0.5					069S TM	mg/kg	0.5
Chromium	19					069S TM	mg/kg	10
Chromium (Hexavalent)	< 10					007S	mg/kg	10
Copper	17					069S TM	mg/kg	5
Lead	110					069S TM	mg/kg	10
Mercury	< 0.6					069S TM	mg/kg	0.6
Nickel	9.0					069S TM	mg/kg	4
Selenium	< 2.5					069S TM	mg/kg	2.5
Sulphate (Total Acid Soluble) as SO4	< 200	-				025a TM	mg/kg	200
Zinc	84					069S TM	mg/kg	10
Free Cyanide	< 1					061S TM	mg/kg	1
Total Cyanide	< 1					061S TM	mg/kg	1
pH	7.4					084S TM	pH Units	1
Acid Soluble Sulphide	< 10					008 TM	mg/kg	10
Thiocyanate as SCN	< 5					061S TM	mg/kg	5
Elemental Sulphur	< 100					032 TM	mg/kg	100
** RAPID PAH SUITE **								
Naphthalene	< 0.5					022R TM	mg/kg	0.5
Benzo(a)pyrene	0.98	-				022R TM	mg/kg	0.5
Rapid PAH (Total 16)	8.86					022R ^I	mg/kg	2
** PHENOLS SUITE **								
Phenol	< 0.1					020S TM	mg/kg	0.1
Total Monohydric Phenols	< 1					020S ^I	mg/kg	1

^I ISO 17025 accredited.

TM MCERTS accredited for sand, loam and clay.

FROM : GRIBLUNDEN TID

Specification for BS 3852 : 2007
Specific Purpose

INPE = In House Procedure / Calibration
Method AE16 = FCP/OES Analysis

Approved: _____ Report Date: 27/04/2016

Approved Signatories: () S J White Managing Director () M Rowley Laboratory Manager () D Faulkner Quality Manager

ACS Environmental Testing Ltd - Unit 14B, Blackthill Road West, Holton Heath () King Park, Poole, Dorset BH16 5LE

Registered in England & Wales No. 6000055

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ALcontrol Laboratories

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email: mkt@alcontrol.com
Website: www.alcontrol.com

Attention: Hugh Davis

CERTIFICATE OF ANALYSIS

Date: 21 September 2010
Customer: H_WOOLDRI_BGT-1
Sample Delivery Group (SDG): 100921-35 **Report No.:** 97470
Your Reference:
Location: STANWELL MOOR

We received 1 sample on Friday September 10, 2010 and 1 of these samples were scheduled for analysis which was completed on Tuesday September 21, 2010. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Iain Swinton

Business Director - Land UK & Ireland



Validated

ALcontrol Laboratories Analytical Services

SDG:	100921-35	Customer:	Wooldridge Contractors Ltd
Job:	H_WOOLDRI_BGT-1	Attention:	Hugh Davis
Client Reference:		Order No.:	
Location:	STANWELL MOOR	Report No:	97470

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2073639	SAMPLE C			

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

Validated

ALcontrol Laboratories Analytical Services

SDG: 100921-35
 Job: H_WOOLDRI_BGT-1
 Client Reference:
 Location: STANWELL MOOR

Customer: Wooldridge Contractors Ltd
 Attention: Hugh Davis
 Order No.:
 Report No: 97470

SOLID

Results Legend	Lab Sample No(s)		2073639
	Customer Sample Ref.		SAMPLE C
	AGS Ref.		
	Depth (m)		
	Container		BAG
Boron Water Soluble	All	NDPs: 0 Tests: 1	X
Cyanide Comp/Free/Total/Thiocyanate	All	NDPs: 0 Tests: 1	X
Easily Liberated Sulphide	All	NDPs: 0 Tests: 1	X
Elemental Sulphur	All	NDPs: 0 Tests: 1	X
Hexavalent Chromium (s)	All	NDPs: 0 Tests: 1	X
Metals by iCap-OES (Soil)	Arsenic	NDPs: 0 Tests: 1	X
	Cadmium	NDPs: 0 Tests: 1	X
	Chromium	NDPs: 0 Tests: 1	X
	Copper	NDPs: 0 Tests: 1	X
	Lead	NDPs: 0 Tests: 1	X
	Mercury	NDPs: 0 Tests: 1	X
	Nickel	NDPs: 0 Tests: 1	X

Validated

ALcontrol Laboratories Analytical Services

SDG: 100921-35
 Job: H_WOOLDRI_BGT-1
 Client Reference:
 Location: STANWELL MOOR

Customer: Wooldridge Contractors Ltd
 Attention: Hugh Davis
 Order No.:
 Report No: 97470

SOLID

Results Legend		2073539
X Test	Lab Sample No(s)	SAMPLE C
N No Determination Possible	Customer Sample Ref.	
	AGS Ref.	
	Depth (m)	
	Container	BAG
Metals by iCap-OES (Soil)	Selenium	NDPs: 0 Tests: 1 X
	Zinc	NDPs: 0 Tests: 1 X
PAH Value of soil	All	NDPs: 0 Tests: 1 X
pH	All	NDPs: 0 Tests: 1 X
Phenols by HPLC (S)	All	NDPs: 0 Tests: 1 X
Sample description	All	NDPs: 0 Tests: 1 X
Total Sulphate	All	NDPs: 0 Tests: 1 X

Validated

ALcontrol Laboratories Analytical Services

SDG: 100921-35
Job: H_WOOLDRI_BGT-1
Client Reference:
Location: STANWELL MOOR

Customer: Wooldridge Contractors Ltd
Attention: Hugh Davis
Order No.:
Report No: 97470

Sample Descriptions**Grain Sizes**

very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm - 2mm	coarse	2mm - 10mm	very coarse	>10mm
Lab Sample No(s)	Customer Sample Ref.			Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
2073639	SAMPLE C				Dark Brown	Sandy Loam	0.063 - 0.1 mm	Stones	Vegetation

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

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

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

Validated

ALcontrol Laboratories Analytical Services

SDG: 100921-35
Job: H_WOOLDRI_BGT-1
Client Reference:
Location: STANWELL MOOR

Customer: Wooldridge Contractors Ltd
Attention: Hugh Davis
Order No.:
Report No: 97470

Test Completion Dates

Lab Sample No(s)	2073639
Customer Sample Ref.	SAMPLE C
AGS Ref.	
Depth	
Type	SOLID
Boron Water Soluble	14/09/2010
Cyanide Comp/Free/Total/Thiocyanate	14/09/2010
Easily Liberated Sulphide	14/09/2010
Elemental Sulphur	15/09/2010
Hexavalent Chromium (s)	14/09/2010
Metals by ICap-OES (Soil)	14/09/2010
PAH Value of soil	14/09/2010
pH	14/09/2010
Phenols by HPLC (S)	14/09/2010
Sample description	13/09/2010
Total Sulphate	14/09/2010

Validated

ALcontrol Laboratories Analytical Services

SDG: 100921-35
 Job: H_WOOLDRI_BGT-1
 Client Reference:
 Location: STANWELL MOOR

Customer: Wooldridge Contractors Ltd
 Attention: Hugh Davis
 Order No.:
 Report No: 97469

Results Legend		Customer Sample Ref.	SAMPLE C				
#	ISO17025 accredited.						
M	mCERTS accredited.						
aq	Aqueous / settled sample.						
diss.filt	Dissolved / filtered sample.						
tot.unfilt	Total / unfiltered sample.						
*	subcontracted test.						
**	% recovery of the surrogate standard to check the efficiency of the method. The results of the individual compounds within the samples are not corrected for this recovery.						
		Depth (m)	Soil/Solid				
		Sample Type					
		Date Sampled					
		Date Received	10/09/2010				
		SDG Ref	100921-35				
		Lab Sample No.(s)	2073639				
		AGS Reference					
Component	LOD/Units	Method					
Phenols, Total monohydric	<0.025 mg/kg	TM062 (S)	<0.025	M			
pH	1 pH Units	TM133	8.15	M			
Sulphur, Elemental	<5 mg/kg	TM136	15.1	M			
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#			
Cyanide, Total	<1 mg/kg	TM153	<1	M			
Cyanide, Free	<1 mg/kg	TM153	<1				
Thiocyanate	<1 mg/kg	TM153	<1	M			
Sulphide, Easily liberated	<15 mg/kg	TM180	<15	#			
Arsenic	<0.6 mg/kg	TM181	10.4	M			
Cadmium	<0.02 mg/kg	TM181	0.325	M			
Chromium	<0.9 mg/kg	TM181	20.7	M			
Copper	<1.4 mg/kg	TM181	36.5	M			
Lead	<0.7 mg/kg	TM181	81	M			
Mercury	<0.14 mg/kg	TM181	<0.14	M			
Nickel	<0.2 mg/kg	TM181	14.5	M			
Selenium	<1 mg/kg	TM181	<1	#			
Zinc	<1.9 mg/kg	TM181	104	M			
Polyaromatic hydrocarbons, Total USEPA 16	<10 mg/kg	TM213	82				
Sulphate, Total	<100 mg/kg	TM221	1670	M			
Boron, water soluble	<1 mg/kg	TM222	<1	M			

Table of Results - Appendix

SDG Number : 100921-35

Client : H_WOOLDRI_BGT

Client Ref :

REPORT KEY

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10⁻⁷

NDP	No Determination Possible	#	ISO 17025 Accredited	*	Subcontracted Test	M	MCERTS Accredited
NFD	No Fibres Detected	PFD	Possible Fibres Detected	»	Result previously reported (Incremental reports only)	EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control

Method No	Reference	Description	Wet/Dry Sample ¹	Surrogate Corrected
PM001		Preparation of Samples for Metals Analysis		
PM024	Modified BS 1377	Soil preparation including homogenisation, moisture screens of soils for Asbestos Containing Material		
TM062 (S)	National Grid Property Holdings Methods for the Collection & Analysis of Samples from National Grid Sites version 1 Sec 3.9	Determination of Phenols in Soils by HPLC		
TM133	BS 1377: Part 3 1990; BS 6068-2.5	Determination of pH in Soil and Water using the GLPH pH Meter		
TM136	Method 17.10, Second Site property, March 2003	Determination of Sulphur by HPLC		
TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999	Determination of Hexavalent Chromium using Kone analyser		
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS+ System" Segmented Flow Analyser		
TM180	Sulphide in waters and waste waters 1991 ISBN 01 175 7186 SCA rec. 2007 (unpublished)	The Determination Of Easily Liberated Sulphide In Soil Samples by Ion Selective Electrode Technique		
TM181	US EPA Method 6010B	Determination of Routine Metals in Soil by ICap 6500 Duo ICP-OES		
TM213	In-house Method	Rapid Determination of PAHs by GC-FID		
TM221	Inductively Coupled Plasma - Atomic Emission Spectroscopy. An Atlas of Spectral Information: Winge, Fassel, Peterson and Floyd	Determination of Acid extractable Sulphate in Soils by IRIS Emission Spectrometer		
TM222	In-House Method	Determination of Hot Water Soluble Boron in Soils (10:1 Water:soil) by IRIS Emission Spectrometer		

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

APPENDIX

APPENDIX

1. Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following:
NRA Leach tests, flash point, ammonium as NH₄ by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.
2. Samples will be run in duplicate upon request, but an additional charge may be incurred.
3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.
4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.
5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.
6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.
7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample – similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.
8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.
9. NDP – No determination possible due to insufficient/unsuitable sample.
10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals – total metals must be requested separately.
11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.
12. Results relate only to the items tested
13. **Surrogate recoveries** – Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 – 130 %.
14. **Product analyses** – Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.
15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).
16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).
17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.
18. Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.
19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.
19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.
20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.
21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.
22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials – whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.
23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 – C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAH MS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
EPH	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
EPH CWG	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
MINERAL OIL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC FID
PCB 7 CONGENERS	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
PCB TOTAL	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PEST OCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	DCM	SOLID PHASE EXTRACTION	GC MS
TPH by INFRA RED (IR)	TCE	LIQUID/LIQUID EXTRACTION	HPLC
MINERAL OIL by IR	TCE	LIQUID/LIQUID EXTRACTION	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GC FID

SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
Solvent Extractable Matter	D&C	DCM	SOXTHERM	GRAVIMETRIC
Cyclohexane Ext. Matter	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
Thin Layer Chromatography	D&C	DCM	SOXTHERM	IATROSCAN
Elemental Sulphur	D&C	DCM	SOXTHERM	HPLC
Phenols by GCMS	WET	DCM	SOXTHERM	GC-MS
Herbicides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
Pesticides	D&C	HEXANE:ACETONE	SOXTHERM	GC-MS
EPH (DRO)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Min oil)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH (Cleaned up)	D&C	HEXANE:ACETONE	END OVER END	GC-FID
EPH CWG by GC	D&C	HEXANE:ACETONE	END OVER END	GC-FID
PCB tot / PCB con	D&C	HEXANE:ACETONE	END OVER END	GC-MS
Polyaromatic Hydrocarbons (MS)	WET	HEXANE:ACETONE	Microwave TM218.	GC-MS
C8-C40 (C6-C40)EZ Flash	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Polyaromatic Hydrocarbons Rapid GC	WET	HEXANE:ACETONE	SHAKER	GC-EZ
Semi Volatile Organic Compounds	WET	DCM:ACETONE	SONICATE	GC-MS

Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Visual Estimation Of Fibre Content.

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -

Trace – Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

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

Asbestos Type

Common Name

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



WOOLDRIDGE

GROUNDWORK CONTRACTORS

Wooldridge Contractors Limited

Unit 17
Hall Grove Farm
Bagshot
Surrey GU19 5HP

Telephone: 01276 470321

Facsimile: 01276 470301

John White
St James Group Ltd
Manor Farm Road,
Reading,
Berks, RG2 0JH

8 June 2009

Dear Sir

Re: Manor Farm Rd, Reading.

As requested we confirm that the recent top soil test carried out for the above development was a sample made up of the follow smaller samples taken from the following gardens.

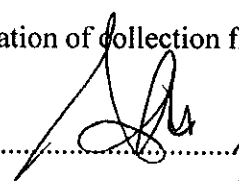
Plots 352,355,358,262,371,375,379,382,386,389,398,412,414, and 423.

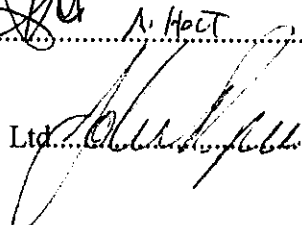
We trust that the results for this top soil material is acceptable.

Yours sincerely

Melvyn Sexton

Confirmation of collection from above gardens.

St James..........

Wooldridge Cont. Ltd..........



Appendix H

WYG Site Photographs of Landgas Membrane



Materials used in Landgas Mitigation Measures- 20th May 2009



Materials used in Landgas Mitigation Measures- 20th May 2009



Block N Formation Level- 20th August 2010



Block N Landgas membrane- 7th September 2010



Appendix I

Wooldridge Contractor Site Photographs



