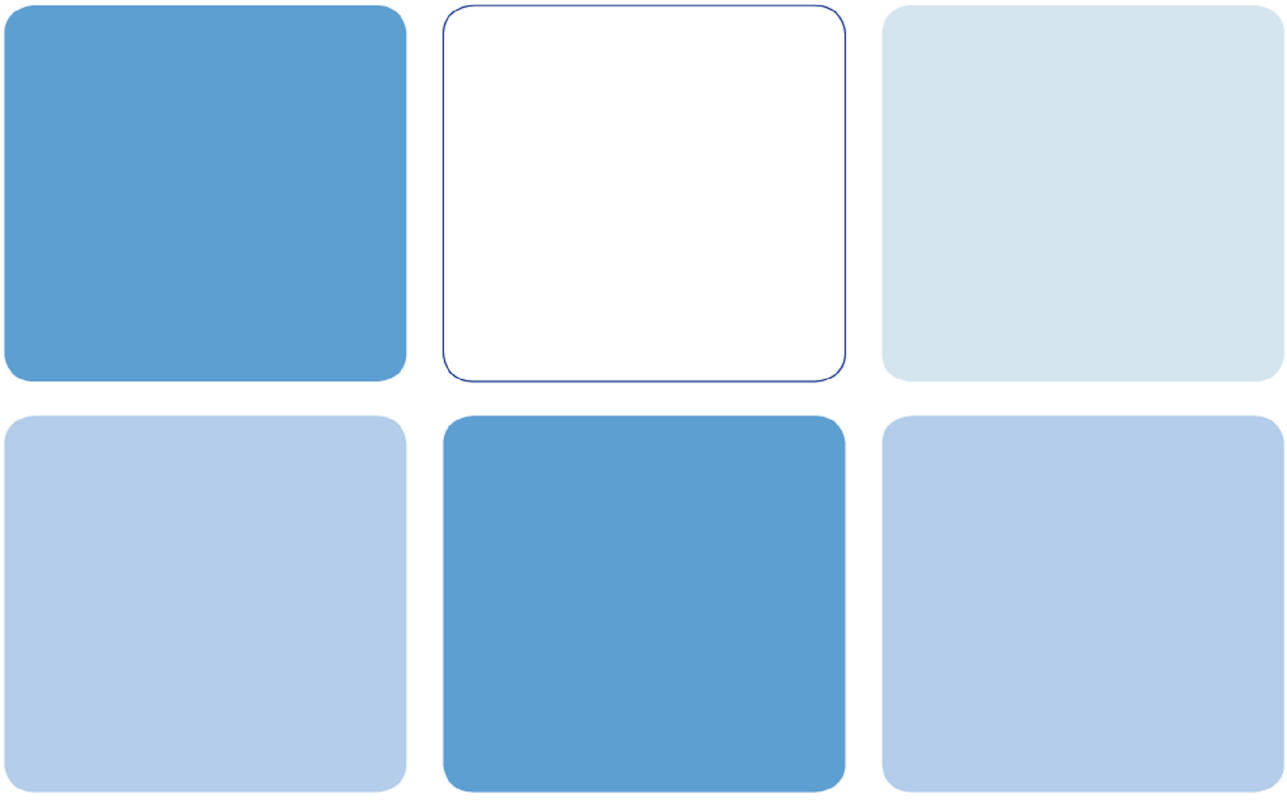
Groundwater and Spring Monitoring Trend Analysis Report, 2013

On Behalf of

South Hook LNG Terminal Co. Ltd.



Date: August 2013

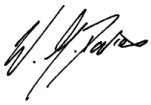
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Date:	October 2013	
Revision:	Revision 6	
Project Number:	JER5575U	
Document Reference:	JER5575U R 131030 GW&SPTAR	
Document File Path:	JER5575 - SHLNG Framework Contract\JER5575U - SHLNG Groundwater Monitoring\Reports\03. RPS Groundwater Monitoring Review\01. RPS Trend Analysis Master Report_2005-2012_2013\Rev6_FINAL_Mar2016	

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Amendment Record

Revision No.	Date	Reason for Change	Authors Initials
Revision 1	8th May 2013	QA Review	WGD
Revision 2	10th May 2013	Internal Technical QA Review	WGD
Revision 3	August 2013	External review. Incorporate client comments & Internal Technical Review	AG / WGD
Revision 4	30th October 2013	Further External Review and Telephone Conference	AG / WGD
Revision 5	30th October 2013	QA Review	WGD
Revision 6	24th December 2015	Client comments (Shane Evans)	AG

Executive Summary

Routine groundwater monitoring has been undertaken on the South Hook LNG Terminal site since 2005. Routine monitoring provides an ongoing record of groundwater quality to identify any changes that may relate to the historical land uses on the site and hence possible implications for the long-term site lease agreement with the site Landlord (Esso Petroleum Company Limited).

A comprehensive review and analysis of the entire groundwater monitoring dataset has been undertaken to identify the long-term trends in groundwater quality as determined from 30 monitoring boreholes on the site. The groundwater dataset covers the period from 2004/2005 to the March 2013 monitoring round, inclusive. The principal conclusions of the trend analysis include:

- The majority of monitoring locations have demonstrated a improvement in water quality since completion of the remediation and/or construction phase of SHLNG terminal site;
- The majority of locations are now characterised by stable or decreasing trends in concentration over recent years or petroleum hydrocarbons no longer appear to be a contaminant of concern.
- Boreholes BH40a, BH45b, BH47a and BH61a appear to indicate recent rising trends, although a these locations are influenced by the anomalous occurrence of DRO observed across much of the site during the December 2012 monitoring round.
- The groundwater quality data for all monitoring locations within Borehole Group 4 provide no evidence for the lateral (down hydraulic gradient) transport of petroleum hydrocarbons along the axis of the skim pond valley towards the coastline; and
- No trends of concern with respect to the contaminants of concern in spring groundwater.

A possible rising trend in concentrations has been identified for Borehole BH50 within the NCA. Although continued monitoring of this borehole remains a priority, the observed trend is not of particular concern as concentration variability between measurements has increased, recent concentrations remain significantly lower than the historical maximum observed in 2006 / 2007 and no water quality issues have been observed at springs situated immediately down gradient of this location.

On the basis of the review a number of modifications to the current monitoring regime are justified. These recommendations are summarised in the table overleaf and include:

- A move from monthly monitoring to quarterly monitoring for all boreholes within the green fence;
- No monitoring of Semi-Volatile Organic Compounds (SVOCs) at location MW01 and MW03;
- Following completion and review of the forthcoming 6-Monthly monitoring round it may be necessary to revise the frequency of monitoring at BH40a, BH45b, BH47a and BH61a.

These proposed modifications to the monitoring regime on the site have the potential to deliver significant cost benefits to the South Hook Terminal Co. Ltd., whilst ensuring a robust dataset is continued to be collected on the SHLNG Terminal site.

Borehole ID	Current Monitoring Regime		Proposed Monitoring Regime		
	Frequency	Suite	Frequency	Suite	Justification
MW01	Quarterly	DRO; GRO; SVOCs	*No Change*	**DRO; GRO**	No VOCs observed in RPS monitoring rounds.
MW03	Quarterly	DRO; GRO; SVOCs	*No Change*	**DRO; GRO**	No VOCs observed in RPS monitoring rounds
BH06	Quarterly	DRO; GRO.	**6-Monthly**	*No Change*	Due to low frequency of occurrence and low concentrations, move to six-monthly sampling.
BH34b	Monthly	DRO; GRO; SVOCs	**Quarterly**	*No Change*	Significant decrease in concentration from 2009 / 2010.
BH40a	6-Monthly	DRO; GRO.	**Quarterly**	*No Change*	Increase frequency for 1 year to investigate anomalous recent trend in DRO.
BH41a	Monthly	DRO; GRO; SVOCs	**Quarterly**	*No Change*	Owing Reduce frquency as trends are stable or declining during operational phase.
BH42a	Monthly	DRO; GRO; SVOCs	**Quarterly**	*No Change*	Although concentrations remain high, they have decreased signifcantly during operational phase and are now stable or declining
BH43	Monthly	DRO; GRO; SVOCs	**Quarterly**	*No Change*	Significant decrease in concentrations observed during operational phase and concentration that are now stable or declining.
BH44	Quarterly	DRO; GRO.	**6-Monthly**	*No Change*	No trends of concern. Reduce monitoring frequency
BH45b	6-Monthly	DRO; GRO.	**Quarterly**	*No Change*	Increase frequency for 1 year to investigate possible rising trend.
BH61a	6-Monthly	DRO; GRO.	**Quarterly**	*No Change*	Increase frequency for 1 year to monitor possible rising trend.

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1 Introduction

1.1 Background

1.1.1 RPS Planning and Development (RPS) undertake routine groundwater monitoring on the South Hook LNG (SHLNG) Terminal Company Ltd site in Milford Haven, Pembrokeshire as part of Framework Contract SH0068. The groundwater monitoring undertaken on the site provides an ongoing record of groundwater quality to identify any changes that may relate to the historical land uses on the site and hence possible implications for the long-term site lease agreement with the site Landlord (Esso Petroleum Company Limited).

1.1.2 Following the completion of 6-months monitoring on SHLNG Terminal site, RPS has been commissioned to undertake a full review of the groundwater monitoring undertaken on the site. The principal objective of this review is to provide a detailed evaluation of the entire monitoring dataset gathered to date, to analyse trends in groundwater quality and determine the most appropriate monitoring programme to be taken forward into the future. Although dependent on the historical water quality observed on the site the future monitoring strategy shall also depend on the future expectations of the Landlord and future regulatory and legislative landscape expected, most notably in association with the site Environmental Permit.

1.1.3 This Groundwater Monitoring Review and Trend Analysis Report shall also enable:

- Confirmation that the pre-handover sampling methodologies are the most appropriate for the overall objective of groundwater monitoring undertaken and the borehole / hydrogeological conditions observed at each location;
- Identify possible improvements to the sampling methodology and frequencies that will provide:
  - More representative samples for analysis hence improved conceptual understanding of groundwater quality on the site;
  - A sampling approach that is cost effective and appropriate for the 5 year duration of the framework contract, whilst meeting all SHLNG H&S site constraints;
- Sampling approaches and methodologies that ensure SHLNG represent best practice, not incurring excessive cost, that meet their environmental management objectives.
- Determine the need for any modification to existing QA / QC protocols in order to provide a more robust and defensible dataset; and
- The data requirements for any future developments upon the site.

1.2 Scope of Works

1.2.1 The specific aims of this report are as follows:

- Review of historical contamination and remediation works on the site;
- Review and appraisal of historical groundwater monitoring dataset;

- Evaluation and update of the detailed Conceptual Hydrogeological Model (CHM) developed for the site, in light of the extended monitoring dataset;
- Review and appraisal of the monitoring network in terms of network distribution and appropriateness of locations in the context of their construction, time-series contamination status and hydrogeological setting;
- Review of regulatory and legislative drivers for the monitoring works and future changes thereof;
- Review of sampling approach and available approaches (including water management);
- Review of analyses and associated Quality Assurance / Quality Control (QA/QC).

1.2.2 A summary of the water levels within the ponds on the Nature Conservation Area that are measured as a part of routine monitoring on the site shall also be provided.

1.2.3 The original scope of works is summarised in the proposal provided in *Appendix 1*.

1.2.4 This report considers the complete monitoring dataset gathered for the site up to and including the March 2013 monitoring round. For the majority of locations this dataset therefore extends from January or February 2005 although a number of monitoring locations also have data for December 2004.

1.3 Report Structure

1.3.1 The following report structure has been adopted:

- Section 2: Environmental Setting ï Provides a brief summary of the environmental setting of the site in terms the site location, history, geology and hydrogeology.
- Section 3: Groundwater Monitoring Regime ï Describes the historical and current monitoring regime on the SHLNG terminal site in terms of the monitoring network, approach, frequencies and analyses.
- Section 4: Conceptual Hydrogeological Model ï Provides a revised hydrogeological conceptual model on the basis of data collected on the site, most notably groundwater levels.
- Section 5: Water Quality Assessment ï Presents the groundwater quality assessment and trend analysis for key boreholes groups on the site. Also reviews other aspects of the monitoring regime on the Terminal site.
- Section 6: Pond Levels Within the NCA ï A summary of the pond levels within the NCA that are measured as part of routine monitoring on the site is provided
- Section 7: Summary and Recommendations ï On the basis of the groundwater quality review a number of recommendations are made with respect to ongoing monitoring on the site.

2 Environmental Setting

2.1 Site Location

2.1.1 The SHLNG Terminal site is located on the Pembrokeshire coastline in south-west Wales, approximately 2.5 km west of Milford Haven. The site is located in a largely rural area comprising agricultural land, farms and small villages.

2.1.2 The site is centred at National Grid Reference SM 875 064 and covers a total area of approximately 210 Hectares (Ha). The site is located on two flat-topped hills with an elevation of approximately 55 m AOD that are bisected by an approximately north-south oriented valley that historically discharged via the Skim Pond to the Milford Haven Waterway in the south.

2.2 Site History

2.2.1 The Terminal is situated on the site of a former oil refinery, which was constructed in the late 1950s and subsequently expanded in the 1970s. The Oil Refinery was closed in 1983 and fully decommissioned by 1986.

2.2.2 Between 1993 and 2003 several phases of intrusive investigation were undertaken on the former site by Dames & Moore and RPS. These included:

- Dames and Moore ôEnvironmental Assessment ï Milford Havenõ, 1993;
- RPS Geo-environmental Investigation Report, 2002;
- RPS Factual Geotechnical Investigation Report, 2003; and
- RPS Geo-Environmental Investigation and Risk Assessment Report 203/40/45/CI/RP/NA/102, January 2004.

2.2.3 During these intrusive works, several areas of contamination (principally hydrocarbons) were identified most notably in association with the main process area of the former refinery and the area surrounding the skim pond / tank sludge disposal area (the ñsludge pitsõ).

2.2.4 In 2004, SHLNG commissioned a ó*Site Remediation Plan*õ to satisfy planning conditions and this included method statements to be used during the site preparation works. Following approval of the submitted plans, site preparation works were commenced. The site preparation works comprised remediation of the identified areas of contamination in addition to the general earthworks that included the excavation, deposition and testing of some 1.2 million cubic metres of material on the SHLNG Terminal construction site.

2.2.5 During the period between September 2004 and June 2005, approximately 130,037 cubic metres of suspected hydrocarbon contaminated soil was excavated from contaminated areas, of which approximately 19,297 cubic metres required on-site treatment and 40 cubic metres required off site disposal due to its lead content. With the exception of this 40 cubic metres of soil, which was removed from site, due to the elevated lead content above site criteria, all soils excavated during the site preparation works have been retained on-site. The works have been

undertaken in line with specifications and methods, as described within the ôSite Remediation Planô Validation data has been compiled and is referenced throughout this report.

2.2.6 The construction phase for the SHLNG Terminal site followed completion of the preparation works, commencing in ca. 2005. The terminal site began it operational phase in 2009.

2.2.7 The key phases on the site are summarised in *Table 2.1*.

Table 2.1 Key Phases on the SHLNG Terminal Site

Date	Phase
Pre-1983	Refinery Operation Phase
1983ï 1986	Refinery Decommissioning Phase
1993 ï 2003	Post Closure Site Characterisation works
2004 ï 2005	SHLNG Site Remediation & Site Preparation Phase
2005 ï 2010	SHLNG Site Construction Phase
2009 to date	SHLNG Operational Phase

2.2.8 Historical modification of the site has included the alteration of the valley and watercourse running through the site (to produce a skim pond) and the construction of terraces to facilitate the founding of the large site structures associated with the oil refinery construction. More recently there has been significant excavation of ground materials beneath the LNG Tank structures in the centre of the site and re-profiling of the remaining site area using the excavated material from the LNG tank base area.

2.2.9 The LNG storage tanks were constructed in deep excavations in the centre of the site. The ñmain excavationò area lowered the surface of the bedrock to below the water table within and therefore necessitated the installation of permanent groundwater drainage in these areas. The main excavation was completed with ground level of ca. 17 m above Ordnance Datum (m AOD).

2.2.10 Routine groundwater monitoring by SHLNG was commenced by WSP in ca 2005 and has continued to date. The groundwater monitoring regime is discussed in detail in *Section 3*. The historical water quality dataset gathered during routine monitoring on the site principally provides a record of water quality during the construction and post construction phase of the terminal site. By defining the long-term trends in the monitoring dataset an indication of whether groundwater quality is improving, stable or declining can be made and hence recommendations for future monitoring made.

2.3 Geology and Ground Conditions

2.3.1 The site is underlain by Devonian bedrock of the Milford Haven Group that is composed of highly folded and fractured sandstone and mudstone units. These units are generally competent at depth but are overlain by a weathered horizon that typically comprises gravelly bedrock and/or gravelly clay.

2.3.2 Extensive earthworks have been undertaken on the site (for both the former refinery and subsequent LNG Terminal construction) and has resulted in complex shallow ground conditions that comprise variable depths of re-worked, weathered or fill materials in the upper horizons.

2.3.3 Recent investigations on the site have demonstrated that as a result of the extensive earth-works undertaken on site the ground conditions can commonly be divided into two groundwater bearing units: an upper reworked or weathered layer horizon and the deeper more competent fractured bedrock materials (RPS, 2012). Groundwater within the weathered or reworked materials is generally restricted to discontinuous layers of higher permeability strata, whilst groundwater within the deeper bedrock materials is for the most part laterally consistent, and in some places confined by overlying lower permeability weathered/reworked materials.

2.4 Hydrogeology

2.4.1 The Milford Haven Group is characterised by a low groundwater yield, only supporting small and/or local abstractions from more permeable horizons or fracture zones. Accordingly, groundwater movement is restricted to fracture flow rather than matrix flow.

2.4.2 Despite the poor yield of the local bedrock, the Milford Haven Group on the terminal site is designated a Secondary A (formerly minor) aquifer unit by the Environment Agency Wales (now Natural Resources Wales). This indicates that the bedrock may contain ñ*permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers*ò No Source Protection Zones (SPZ) have therefore been defined for this groundwater bearing unit in the vicinity of the site.

2.4.3 The dominance of fracture flow within the bedrock is reflected in the presence of numerous springs, spring-lines and seepages along the coastal margin surrounding the site, although the groundwater catchment area for these springs is not known.

2.4.4 The Haven represents the principal receptor of groundwater contained in the bedrock underlying the site towards which groundwater on the site will ultimately discharge.

2.5 Environmental Receptors & Sensitivity

2.5.1 The South Hook LNG Terminal site is located in an environmentally sensitive location afforded protection by a range of national and European legislation. In particularly the local environs of the site include:

- Part of the Pembrokeshire Coast National Park Authority (PCNPA);
- Waters of the Milford Haven Waterway; and
- Part of the Pembrokeshire Marine Special Area of Conservation (SAC).

2.5.2 The bedrock underlying the site is saturated at depth with a water table that generally reflects surface topography. The dominance of fracture flow within the bedrock is reflected in the presence of numerous springs, spring-lines and seepages along the coastal margins

surrounding the site. The Haven therefore represents the principal receptor of groundwater contained in the bedrock underlying the site.

3 Groundwater Monitoring Regime

3.1 Historical Monitoring Regime

3.1.1 The historical monitoring network on the SHLNG site comprises up to 77 boreholes located across the site area and its immediate environs. The selection of boreholes for use in any specific monitoring strategy (e.g. prior to development, during development and post construction) is based on the particular environmental management drivers for that strategy. Prior to redevelopment of the site the monitoring will have focused on evaluating baseline conditions to inform the nature and extent of remediation required to be protective of end-use development and controlled waters. This will have been followed by the remediation monitoring strategy stage to demonstrate that the level of cleanï up agreed by the regulators had been achieved. Prior to operation of the LNG facility there was a further monitoring strategy to establish post remediation baseline condition and establish any short/medium impacts on groundwater quality associated with the physical disturbance of the soils/sub soils during the construction phase.

3.1.2 Since operation of the site in 2009 the monitoring has focused on the collection of lines of evidence to detect any change in groundwater quality associated with historic contamination and demonstrate that the site operational Environmental Management Systems are effective in ensuring no deterioration in groundwater quality from the pre-operational baseline condition.

3.1.3 RPS first undertook groundwater monitoring on the site between November 2002 and November 2004. Based on the data acquired during these monitoring rounds, a hydrogeological assessment was produced that defined the groundwater flow regime present on the site. This assessment identified groundwater flow divides running approximately north-south at the topographic high points either side of the valley feature. The subsequent monitoring regime was largely designed based on the outcomes of this initial hydrogeological assessment.

3.1.4 Following the initial monitoring undertaken by RPS, WSP were commissioned to undertake routine groundwater monitoring in January 2005. The monitoring regime outlined by WSP was based on the hydrogeological setting presented by RPS, together with a predicted zone of influence of the main excavation works. Monitoring boreholes located within the predicted flow divides containing the excavation works were to be monitored on a monthly basis, and those outside the flow divide were monitored on a quarterly basis. This report therefore covers a monitoring period that typically extends from 2004 or 2005 up to the March 2013, inclusive.

3.1.5 The suite of analysis used for the routine monitoring reflected the historical refining operations on the site and included gasoline (or petroleum) range organics (GRO), diesel range organics (DRO), BTEX hydrocarbons and semi-volatile organic compounds (SVOCs). The monitoring regime comprised a total of 19 monthly monitoring locations and 21 quarterly monitoring locations. Two further locations (MW01 and MW03) were added to the quarterly monitoring

round in 2010 and 2011 respectively and have been monitored at this frequency until the present date.

3.1.6 To assess the quality of water being discharged to the Milford Haven Waterway, seven spring locations were also monitored by WSP on a monthly basis between December 2009 and February 2010. Spring monitoring continues to date on an annual basis.

3.1.7 Due to disruption at the site during the construction of the LNG Terminal, 16 boreholes were lost, of which several were re-instated (i.e. those with suffixes A or B). Ten further boreholes were advanced by WSP in July 2005. The monitoring regime was also amended to account for the new or re-instated monitoring boreholes. Typically replacement boreholes were reinstated as close to their original position as practicably possible and given an alphabetic identifier (e.g. BH41 was replaced with BH41a).

3.1.8 During November 2005, groundwater elevation data across the site, including those outside flow divides, were monitored on a monthly basis to provide a more complete groundwater elevation dataset.

3.1.9 A second phase of borehole installation was undertaken in February 2006, to replace the boreholes destroyed during construction and to provide additional groundwater elevation data. A further, third phase of groundwater monitoring borehole installation took place in February 2008.

3.2 Current Monitoring Regime

3.2.1 The groundwater monitoring details are summarised in SHLNG written procedures (Report Ref. *ERL-12.04.-05*) and the associated RPS Method Statements. This routine monitoring regime was originally delivered by WSP (from ca. January 2005 to September 2012) and subsequently by RPS (from October 2012 to date).

Monitoring Locations

3.2.2 A total of thirty boreholes have been routinely monitored on the site as shown in *Drawing JER5575U-001a*. Thirteen boreholes are located within the inner high-security green fence. The remaining seventeen monitoring boreholes are located outside the green fence but within the current site boundary. The monitoring network includes borehole MW01 and borehole MW03 situated within the green fence immediately down gradient of the Skim Ponds, which were added to network in 2010 and 2011.

3.2.3 The details of each monitoring location are summarised in *Table 3.1* and *Table 3.2* with their associated geological log provided in *Appendix 2*.

Table 3.1 Summary of Groundwater Monitoring Locations (Inside Green Fence)

ID	Diam (mm)	Depth from Log (m)	Plumbed Depth (mbTOC)*1	Typical Depth to GW (mbTOC)	Water Column Height (m)	Slotted Section (mbTOC)	Sample Approach	Sample Frequency	Analytical Suite*3
BH34b	100	12	12.17	3.06	9.11	N/K	Bailers	Monthly	DRO; GRO; SVOCs
BH41a	100	17	16.70	3.92	12.79	10 - 17	Bailers	Monthly	DRO; GRO; SVOCs
BH42a	100	18	17.60	5.33	12.27	10 - 18	Bailers	Monthly	DRO; GRO; SVOCs
BH43	100	15	14.75	3.75	11.00	3 -12	Bailers	Monthly	DRO; GRO; SVOCs
BH06	100	14.2	14.40	7.15	7.25	8 - 14.2	Bailers	Quarterly	DRO; GRO.
BH44	100	28	27.15	6.33	20.83	3 - 28	Bailers	Quarterly	DRO; GRO.
MW1	50	8.5	7.81	2.04	5.77	N/K*2	Bailers	Quarterly	DRO; GRO; SVOCs
MW3	50	18.8	14.72	4.07	10.65	N/K	Bailers	Quarterly	DRO; GRO; SVOCs
BH30a	100	30	29.75	4.46	25.29	10 - 30	Bailers	6-Monthly	DRO; GRO.
BH40a	100	18	17.00	4.30	12.70	N/K	Bailers	6-Monthly	DRO; GRO.
BH45b	100	30	29.04	12.86	16.18	N/K	Bailers	6-Monthly	DRO; GRO.
BH63a	100	17	16.62	3.18	13.44	4 - 17	Bailers	6-Monthly	DRO; GRO.
BHG2b	100	28	24.87	0.60	24.27	N/K	Bailers	6-Monthly	DRO; GRO.

*1 mbTOC denotes metres below Top of Casing

*2 N/K denotes not known

*3 DRO denotes Diesel Range Organics; GRO denotes Gasoline Range Organics; and SVOCs denote Semi-Volatile Organic Compounds

Table 3.2 Summary of Groundwater Monitoring Locations (Outside of Green Fence)

ID	Diam (mm)	Depth from Log (m)	Plumbed Depth (mbTOC)*1	Typical Depth to GW (mbTOC)	Water Column Height (m)	Slotted Section (mbTOC)	Sample Approach	Sample Frequency	Analytical Suite*3
BH50	100	20	18.68	3.39	15.29	6 - 20	Submersible "Whale" Pump	Quarterly	DRO; GRO.
BH01	100		17.89	8.98	8.91		Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH18	100	20	19.90	4.34	15.56	3 - 20	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH19	100	20	21.52	6.37	15.15	3 - 20	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH20	100	16	14.84	5.83	9.01	4 - 16	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH22	100	18.75	18.91	5.47	13.44	3 - 18.75	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH26	100	18	18.31	4.83	13.48	3 - 18	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH27a	100	15	13.83	4.06	9.77	9.4 - 15	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH36b	100	28	27.47	13.71	13.76	N/K*2	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH47a	100	43	43.00	19.96	23.04	10 - 43	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH49	100	30.5	30.60	17.02	13.58	12 - 30.5	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH53	100	24.5	21.80	4.84	16.96	3 - 12?	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH55	100	15	14.82	5.22	9.60	3 - 15	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH59	100	15.1	17.79	4.30	13.49	3 - 11.5	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH60b	100	25	24.18	6.90	17.28	N/K	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH61a	100	13	21.65	3.12	18.53	3 - 13	Submersible "Whale" Pump	6-Monthly	DRO; GRO.
BH65	100	33	23.36	6.91	16.45	24.3 - 33	Submersible "Whale" Pump	6-Monthly	DRO; GRO.

*1 mbTOC denotes metres below Top of Casing

*2 N/K denotes not known

*3 DRO denotes Diesel Range Organics; GRO denotes Gasoline Range Organics; and SVOCs denote Semi-Volatile Organic Compounds

3.2.4 With the exception of borehole MW01 and borehole MW03, which have an Internal Diameter (ID) of ca. 50 mm, all groundwater motoring locations have an ID of approximately 100 mm. Borehole depths range between 7.8 m and 43 m and largely relate to the topographic position of each monitoring borehole and the resulting depth to groundwater. The depth to the top of the slotted well casing and length of the slotted well casing section in each borehole is variable, although most boreholes have been completed with a significant depth of water situated within the slotted well casing. Some monitoring boreholes have been completed with slotted well casing below the local groundwater level, whereas others have an unconfined water table present within the slotted well casing (i.e. borehole õresponse zoneö). This difference in construction has significant implication with respect to groundwater quality most notably with respect to the presence and/or influence of Light Non Aqueous Phase Liquid (LNAPL), which would be expected to float on groundwater if present.

3.2.5 Groundwater samples are also taken from the seven springs shown on *Drawing JER5575U-001a* that are situated along the southern and western coastal boundary. Springs are monitored to determine if any contaminants are leaving site via groundwater pathways.

Monitoring Frequency

3.2.6 The monitoring frequency for each borehole is summarised in *Table 3.1* and *Table 3.2* and shown on *Drawing JER5575U/001a*. Four boreholes situated up-stream of the skim pond and to the south of the dewatered LNG storage tank area are monitored on a monthly basis. Five monitoring boreholes are monitored on a quarterly basis, with the remaining twenty boreholes sampled on a 6-Monthly basis. Coastal springs are monitored on an annual basis.

Sampling Approach

3.2.7 All monitoring boreholes are initially dipped using an oil-water interface probe, to determine the presence, depth and thickness of any layer product within each borehole. The boreholes are then dipped with an electronic dip meter and cleaned with water and towel.

3.2.8 In accordance with the historical monitoring regime, boreholes situated within the green fence are sampled using a borehole-specific disposable bailer. Outside of the green fence the monitoring boreholes are sampled using a battery powered submersible õmega whale pumpö. A nominal 20 bailer volumes is removed (i.e. purged) from each monitoring location within the green fence, which equates to a total purge volume of approximately 23L. The submersible whale pump allows a more traditional high-flow borehole purge sampling approach to be used. Typically three well volumes are removed when undertaking high-flow purging, although prior to 2012 (when RPS took over groundwater monitoring from WSP) only a single well volume has removed from each borehole during sampling on the site, with the resulting purge waters discharged to ground.

3.2.9 Historically two samples have been taken at each monitoring location on the site: An initial õpre-purgeö sample taken before the purging of water by bailer or submersible pump and given the

suffix ñNPò on the lab schedules (denoting Non-Purged sample); and a post-purge sample. It is important to note that within the green fence, pre-purge and post purge samples are taken with separate, clean disposable bailers. The pre-purge samples taken outside of the green fence are also taken with a clean bailer, prior to purging with a submersible pump. Pre-purge samples were taken in an attempt to determine whether consistency or systematic difference between the quality of samples taken by each approach.

3.2.10 All samples are subsequently stored within temperature controlled cool boxes and collected on the same day for analysis.

Laboratory Analyses

3.2.11 Historic groundwater quality monitoring undertaken by RPS between 2002 and 2004 identified elevated concentrations of benzene, toluene, naphthalene, phenol, xylenes, Diesel Range Organics (DRO) and Gasoline Range Organics (GRO), of which DRO and GRO were observed to have the widest site coverage.

3.2.12 All groundwater samples are analysed for the following petroleum hydrocarbons:

- Gasoline Range Organics (GRO) (C_5 to C_{10}) by Gas Chromatography by Flame Ionised Detector (GC-FID); and
- Diesel Range Organic (DRO) (C_{10} ï C_{40}) measured as Extractable Petroleum Hydrocarbons (EPH) by GC-FID.

3.2.13 The limit of detection for the analysis of GRO and DRO is typically 10 εg/l.

3.2.14 Six boreholes located within the green the fence and identified in *Table 3.1* are also analysed for a standard laboratory suite of sixty Semi-Volatile Organic Compounds (SVOCs) by Gas Chromatography/Mass Spectrometry (GCMS). The SVOC suite includes a range of Polycyclic Aromatic Hydrocarbons (PAHs), phenolic compounds and chlorobenzene compounds. The limit of detection for the analysis of SVOCs is typically 10 εg/l.

Quality Assurance & Quality Control

3.2.15 To ensure the reliability of results the following QA / QC measures are implemented by RPS during each round:

- Sample sequence from least contaminated to most contaminated monitoring location;
- Using new, clean, disposable bailer and cord for each pre and post purge sample for a single location;
- Taking 1 or 2 blind duplicate samples for analysis by laboratory to demonstrate result reproducibility;
- Segregation of samples in cool boxes on basis of suspected / historical contamination levels;
- Provision to labs an indication of likely contamination status of samples to prevent issues with instrumentation (e.g. contamination, dilution issues etc); and

- Rinsing of submersible pump with clean water between sample locations and at the end of the monitoring round.

4 Conceptual Hydrogeological Model

4.1 Overview

4.1.1 The Devonian bedrock underlying the site constitutes a Secondary A (formerly minor) aquifer unit. These aquifer units are composed of *õpermeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to riversò*

4.1.2 Geological logs for the boreholes monitored on the Terminal site are provided in *Appendix 2*. Groundwater has been identified in all monitoring boreholes constructed on the site. The inter-granular porosity of the competent bedrock is expected to be limited, with groundwater flow and storage provided by the fracture porosity. The interconnectivity of the fracture porosity will generally decline with depth as overburden pressure increases and the degree of weathering declines. This will result in an associated reduction in permeability and vertical hydraulic connectivity with depth.

4.1.3 The bedrock is overlain by lithologically diverse unconsolidated deposits that include:

- Weathered bedrock;
- Clay rich superficial and/or weathered deposits;
- Re-worked natural materials excavated and redistributed on the site; and
- Made Ground emplaced beneath structures on the site or structures formerly present on the site.

4.1.4 The hydraulic properties of unconsolidated deposits situated on the bedrock will also be variable, comprising both cohesive aquitard units and granular water-bearing horizons.

4.1.5 Recharge to the competent bedrock and overlying units is derived from the infiltration of local precipitation. The total recharge to the aquifer will depend on infiltration capacity of the shallow soils, the proportion of run-off and the nature of shallow subsurface geology and Made Ground. The magnitude of recharge will be strongly controlled by the gradient of slopes (e.g. in the valley around the skim ponds) and permeability of surface deposits.

4.1.6 The bedrock is likely to be an unconfined with a water table that reflects the local topography. Deep groundwater flow is unlikely to be quantitatively significantly transport mechanism. Most groundwater flow being shallow, albeit relating to secondary fracture porosity. Although there is evidence of discrete spring discharges at various localities along the coast it is unclear whether these relate to local groundwater flow system or larger-scale structural fracture pathways on the site.

4.1.7 The permeability of the geological units encountered on the site is likely to vary significantly with depth as the degree of weathering declines and overburden pressure increases causing the closure of fractures.

4.2 Groundwater Levels & Flow System

Time Series Groundwater Levels

4.2.1 Time series groundwater level charts for all boreholes routinely monitored on the SHLNG terminal site (as identified *Table 3.1* and *Table 3.2)* are provided in *Appendix 3*. Semi-continuous water level data collected by RPS over the winter of 2009 / 2010 using automatic data loggers is also provided in *Appendix 4*.

4.2.2 Although the groundwater hydrographs provided in *Appendix 3* are complex and variable in nature they are typically characterised by:

- A large range in absolute water levels between boreholes across the site, varying from below 5 m AOD (MW01) to more than 40 m AOD at boreholes located at high topographic elevation on the site (e.g. BH18, BH22, BH26 and BH44);
- A generally steep hydraulic gradient on the site;
- A large annual range in water level at individual boreholes, typically of 2 - 4 m but being significantly greater than 4 m at many locations; and
- Typically a rise in water level during autumn with highest water levels in winter/spring, followed by a spring/summer recession.

4.2.3 The observed response appears consistent with a largely unconfined aquifer system, characterised by low storage that respond quickly to rainfall events. The absence of clear annual trends in time series groundwater levels shown in *Appendix 3* is likely to relate to the flashy response of groundwater to rainfall events as shown in the semi-continuous logger data provided in *Appendix 4*. The logger data in *Appendix 4* also shows a tidal influence in low lying coastal boreholes situated within the valley of the skim pond. Furthermore, groundwater levels are also seen to be high in close proximity to the coastal margin, as seen at MW01, BH34b and MW03.

Groundwater Flow System

4.2.4 In addition to a review of the temporal groundwater level variations for each monitoring location on the site (*Appendix 3*), an assessment of spatial groundwater level variations across the Terminal site has also been undertaken. Four 3-D groundwater elevation contour plots have been produced for the site and are provided in the three drawings provided in *Appendix 5*. These contour plots have been produced for the following monitoring rounds:

- 14th January 2004: Pre-construction phase;
- 1st January 2006: Pre-operation phase;
- 30th June 2011: Operational phase groundwater low dataset; and
- 31st January 2012: Operational phase groundwater high dataset.

4.2.5 The groundwater contour plots were constructed for the site using the WSP monitoring dataset with the maximum number of monitoring locations. The contour plots have been produced using

the *Surfer 11* software package and the following assumptions have been required to produce meaningful contours from the groundwater level dataset:

- A fixed head for the coastal (mean tide level) boundary of 0.0 m AOD: This indicates that mean tide level is the hydraulic minimum that the entire groundwater system discharges to; and
- Active dewatering beneath the LNG storage tanks that is simulated by using a fixed head in this area of 16 m AOD, equivalent to 1.0 m below the finished ground level.

4.2.6 The resulting contour plots suggest that groundwater levels reflect surface topography, with the highest groundwater elevations observed beneath topographic high ground to the north, east and southwest and steep hydraulic gradients orientated towards the coastal boundary. There is a strong similarity between all the three post-dewatering contour plots, although absolute levels are variable. Key observations from the contour plots include:

- A major groundwater divide in the west that extends, from north to south, from high ground around BH22 in the north (within the Nature Conservation Area), along the western edge of the main process area, up to the fort within the southern end of the NCA. This divide marks the point of divergence between westerly groundwater flow towards the coastal boundary and more easterly flow towards either the dewatered main excavation area (i.e. LNG storage tanks) and/or the valley containing the skim pond.
- A major groundwater high to the east of the valley containing the skim pond, defined by borehole BH19 and BH18;
- Significant flow convergence towards the valley of the skim pond and the dewatered main excavation area around the LNG storage tanks;
- High groundwater levels and groundwater flow onto the site along the northern site boundary (i.e. BH26, BH27a and BH55), with groundwater flow largely orientated towards the dewatered area of around the LNG storage tanks;
- Axial groundwater flow along the valley of the skim ponds; and
- Significant contour control by boreholes BH20 and BH53 situated within the NCA in close proximity to the western site boundary.

4.2.7 These general features are seen in pre-dewatering contour plot (January 2004) and the three post dewatering plots, although the latter three plots are characterised by steeper gradients and larger catchment area around the main excavation area at the top end (up-stream) of the skim pond valley.

4.2.8 The groundwater divides identified from the two operational phase datasets are presented on the drawings in *Appendix 5* and are also included on *Drawing JER5375U/003a*

Groundwater – Surface Water Interaction along Valley of Skim Pond

4.2.9 RPS produced a report in 2010 that investigated the hydrogeology of the Skim Pond (RPS, 2010). From a detailed review of groundwater level data and the production of a water balance for the skim pond area, the following conclusions were reached:

4.2.10 ñ*On the basis of the groundwater levels measured on site, two possible end member scenarios can be postulated regarding groundwater – Skim Pond interaction:*

- *Complete hydraulic continuity between groundwater and Skim Pond. Groundwater discharges directly into pond with groundwater contours following Skim Pond level;*
- *Hydraulically isolated Skim Pond. Assumes bed and banks are impermeable so steep groundwater contours following topography, but not affected by pond or channel levels.*

4.2.11 The true nature of the groundwater – Skim Pond interaction will be a mixture of the two scenarios above. It is evident that groundwater flow surrounding the Skim Pond flows towards it from a south-easterly or south-westerly direction, with potential for inflow evident up-gradient of the V-notch weir at the up gradient end of the Skim Pond and through the sides of the Skim Pond itself. Groundwater down gradient of the Skim Pond flows along the valley towards the coastline with discharge occurring as discrete spring flows or as diffuse discharge either through the sea floor or through a complex intertidal mixing zone.

4.2.12 *It can be concluded that some groundwater is being discharged into the pond, although the significance of this flow is uncertain. The location and quantity of discharge will be dependent on the nature and permeability of intervening banks side materials and pond bottom substrate.*ò

4.2.13 This assessment suggests that a significant component of groundwater underflow expected along the valley of the Skim Pond is discharged to the coastline in the vicinity of borehole MW01.

Position of Monitoring Locations within the Groundwater Flow Field

4.2.14 From the schematic contour plots provided in *Appendix 5* the relative position of all monitoring locations within the groundwater flow field can be defined. Furthermore, there is little change in these relative positions, for each of the contour plots despite the variability of absolute groundwater levels observed. The position of each monitoring location is described in *Section 5*.

4.2.15 It is unclear from the contour plan whether the coastal springs monitored as part of routine monitoring will derive groundwater from the local, topographically driven, groundwater flow system or represent larger-scale preferential flow paths possibly that do not follow topography. Groundwater quality observed at the spring locations may give some indication of the catchment area of springs.

5 Water Quality Assessment

5.1 General Approach

Overview

5.1.1 RPS has been commissioned to undertake a review of the entire water quality dataset gathered for the SHLNG terminal site, with a view to providing recommendations for ongoing monitoring on the site. The database provided to RPS extends back to December 2004. This dataset has been augmented with additional monitoring data collected by RPS since October 2012 and now covers the period up to December 2012. RPS data collected for the first quarter of 2013 has not been included in this review.

5.1.2 The SHLNG quality dataset provides historical records for the following petroleum hydrocarbons:

- Total Gasoline Range Hydrocarbons (GRO) equivalent to Petroleum Range Hydrocarbons (PRO); and
- Diesel Range Hydrocarbons (DRO).

5.1.3 The dataset does not include any records for Semi Volatile Organic Compounds (SVOCs) historically monitored at a number of locations on the site. An assessment of SVOCs has therefore been restricted to the dataset collected by RPS since October 2012.

5.1.4 The assessment presented in this report follows trend analysis reports previously produced for the site by WSP, namely:

- South Hook LNG Terminal, Updated Groundwater Trend Analysis Report, February 2012;
- South Hook LNG Groundwater Monitoring and Trend Analysis Report, South Hook LNG, June 2009; and
- South Hook LNG Groundwater Monitoring and Analysis, South Hook LNG, November 2005.

5.1.5 These reports have been reviewed to ensure as far as possible continuity of approach and conclusions.

Borehole Groups

5.1.6 In earlier trend analysis reports the groundwater monitoring network has been sub-divided into five key groups, namely:

1. Main Excavation Boundary Monitoring Wells (BH30(A) and BH36(A));
2. Monitoring Wells South of Main Excavation Area (BH45(A, B) and BHG2(A));
3. Valley Area Up-stream of Skim Pond (BH41(A), BH42(A, B), BH40(A), BH44 and BH43);
4. Nature Conservation Area (NCA) (BH49 and BH50)
5. Valley Area Down-Stream of Skim Pond (BH06 and BH34(A, B))

5.1.7 It is notable that not all boreholes included in the routine monitoring have been reported in the historical trend analysis reports. For simplicity, this assessment uses the same broad groups when discussing the water quality dataset, although these groups have been expanded to include: other boreholes situated in close proximity to the main group; and, where appropriate, a sub-division of their position within borehole group with respect to their position in the local groundwater flow field as defined by the groundwater contours maps provided in *Appendix 5,* summarised in *Drawing JER5575U/003a* and described in *Section 4*. Finally, a number of additional groups have been added for completion. The borehole groups used in this assessment therefore include:

1. Main Excavation Area Boundary Wells:
   - *Eastern Boundary Wells*: BH30(A), BH36(A)
   - *Northern Boundary Well*: BH65(A)
   - *North-eastern Boundary Well*: BH59(A)
2. Monitoring Wells South of the Main Excavation Area:
   - *Up-gradient*: BHG2(A), BH18, BH19
   - *Mid-flow field*: BH40(A), BH45(A, B), BH01
   - *Down-gradient:* BH63(A)
3. Valley Area Up-stream of the Skim Pond:
   - *Sludge Pit*: BH41(A), BH42(A, B)
   - *Down-stream Sludge Pit*: BH44
   - *Up-stream Sludge Pit (Jet Hammer Blinds)* BH43
4. Valley Area Down-Stream of the Skim Pond:
   - Boreholes MW03, BH06, BH34B and MW01
5. Process Area:
   - Boreholes BH60B and BH61A
6. Nature Conservation Area (NCA):
   - *Southern NCA*: BH49, BH50
   - *Mid NCA:* BH53
   - *Northern NCA:* BH20, BH22;
7. High Ground to West of Skim Pond:
   - Borehole BH47A
8. Northern Site Boundary groundwater inflow:
   - Boreholes BH26, BH27A, BH55.

5.1.8 The eight borehole groups, associated monitoring locations and groundwater divides defined for this assessment are shown in *Drawing JER5575U-003a*.

Trend Analysis

5.1.9 Petroleum hydrocarbons represent the principal contaminant of concern identified in groundwater on the Terminal site. Consistent with previous trend analysis reporting, analysis has therefore focussed on the Total GRO and Total DRO dataset for post-purge samples. Non-purged samples did not form part of the trend analysis although this data is discussed in *Section 5*.

5.1.10 Only a small number of monitoring locations have demonstrated a continuous or largely continuous presence of petroleum hydrocarbons at concentrations above the Limit of Detection (LOD) during routine monitoring. Furthermore, many boreholes are characterised by extremely variable contaminant concentrations characterised by a large standard deviation. The trend analysis presented herein has therefore been based upon the following approaches:

- Review of the detailed time series water quality charts for Total DRO and GRO utilising both linear and logarithmic scales provided in *Appendix 7*;
- Review of tabulated statistical data for entire monitoring dataset provided in *Appendix 6*; and
- Review of tabulated statistical data for ñannualò periods where contaminants of concern are more routinely observed in groundwater and the associated time series charts of the annual average data (*Appendix 6* and *Appendix 7*).

5.1.11 Linear regression and/or more detailed statistical analysis of the water quality dataset (e.g. Mann Kendall Test) has not been undertaken as part of this assessment for the following reasons:

- Statistical methods are not appropriate for datasets characterised by large concentration variability and/or only occasional contamination occurrence (i.e. spikes); and
- The three approaches above provide a sufficiently robust assessment of trends that is commensurate with the conclusions / recommendations presented regarding ongoing monitoring presented herein.

Results of Previous Trend Analysis Report (WSP, 2012)

5.1.12 The results of the last trend analysis undertaken for the SHLNG terminal site (WSP, 2012) is summarised in *Table 5.1.*

Table 5.1 Results of Trend Analysis in February 2012.

Borehole ID	Parameter	Summary of Trend (2012)
INSIDE GREEN FENCE		
BH34b	GRO	No Trend Identified
	DRO	Decreasing
BH41a	GRO	Decreasing
	DRO	Decreasing
BH42a	GRO	Increasing
	DRO	Increasing
BH43	GRO	Increasing
	DRO	Increasing
BH06	GRO	No Detectable Contamination
	DRO	No Detectable Contamination
BH44	GRO	Decreasing
	DRO	No Detectable Contamination
BH30a	GRO	No Detectable Contamination
	DRO	Decreasing
BH40a	GRO	No Detectable Contamination
	DRO	No Detectable Contamination
BH45b	GRO	No Detectable Contamination
	DRO	No Detectable Contamination
BHG2b	GRO	Decreasing
	DRO	Decreasing
OUTSIDE GREEN FENCE		
BH50	GRO	No Trend Identified
	DRO	No Trend Identified
BH18	GRO	No Detectable Contamination
	DRO	Decreasing
BH19	GRO	No Detectable Contamination
	DRO	No Detectable Contamination
BH20	GRO	No Detectable Contamination
	DRO	No Detectable Contamination
BH22	GRO	No Detectable Contamination
	DRO	No Detectable Contamination
BH26	GRO	Decreasing
	DRO	No Detectable Contamination
BH27a	GRO	No Detectable Contamination
	DRO	No Detectable Contamination
BH36b	GRO	Decreasing
	DRO	Decreasing
BH49	GRO	No Detectable Contamination
	DRO	No Detectable Contamination
BH53	GRO	No Detectable Contamination
	DRO	Decreasing
BH55	GRO	No Detectable Contamination
	DRO	No Detectable Contamination
BH59	GRO	No Detectable Contamination
	DRO	No Detectable Contamination

5.1.13 It should be noted that the trend for DRO at borehole BH43 was double entered in the above table produced by WSP, suggesting both an increasing trend as well as no trend identified.

5.2 Groundwater Quality Results: Petroleum Hydrocarbons

5.2.1 The detailed trend analysis for Total GRO and Total DRO measured all locations is described below and summarised in the table provided in *Appendix 8*.

1. Main Excavation Area Boundary Wells

5.2.2 The main excavation boundary wells include boreholes BH30A and BH36(A, B) situated immediately east of the LNG storage tank main excavation area, borehole BH65A to the north of the main excavation area and BH59A further to the northeast of the main excavation area. The time series charts for each location is given in *Appendix 7*.

Eastern Boundary Wells

5.2.3 The original boreholes, BH30 and BH36, were located in an area historically identified as ñ*an area of elevated groundwater contamination*ò and were reinstated in July 2005 following removal of suspected contaminated material in the vicinity of these wells (WSP, 2012). A decreasing trend for GRO and decreasing trend for GRO and DRO were previously report for BH30A and BH36A respectively (WSP, 2012).

5.2.4 Borehole BH30A is characterised by:

- Rare occurrence of GRO in groundwater (9% of samples analysed) with a low GRO concentration when present (less than 34 µg/l) and very low frequency of occurrence (i.e. once every 2 years) after borehole reinstatement. Single occurrence of GRO above LOD in 2011 / 2012.
- Rare occurrence of DRO in groundwater (5% of samples analysed) with low DRO concentration when present and very low frequency of occurrence, with a single occurrence above the LOD in the period 2011-2013.

5.2.5 No trends of concern are apparent for BH30A and hydrocarbon contamination at this source does not represent an issue.

5.2.6 Groundwater quality at BH36B (formerly BH36A) is characterised by:

- A high concentration of GRO in borehole BH36A in early 2005. Since 2006, GRO is identified rarely in groundwater (i.e. 4 samples out of 47 analysed) at low concentration (<45 µg/l) and infrequently, with a single occurrence at the LOD over the period 2011-2013.
- Since 2006, GRO is rarely identified in groundwater (7 out of 45 samples analysed). When identified in groundwater GRO is typically present at a low concentration (< 300 µg/l) with the exception of a single spike in March 2008 with a concentration of 3,600 µg/l, immediately after reinstatement of this location. Low frequency of GRO occurrence with only two occurrences at or above the LOD over the period 2011-2013.

5.2.7 GRO and DRO concentrations are generally stable and characterised by infrequent occurrence in groundwater. No trends of concern are apparent.

Northern Boundary Well

5.2.8 Borehole BH65A is situated immediately up-gradient of the ME area, to the north of the LNG storage tanks. Water quality at BH65A is characterised by:

- Rare occurrence of GRO in groundwater, with only three of fifty analyses recording concentrations above the LOD and only a single occurrence (at the LOD) over the period 2011-2013.
- Rare occurrence of DRO in groundwater, with only five of fifty analyses recording concentrations above the LOD. Anomalous occurrence of DRO observed in December 2012 monitoring round although the measured concentration is within historical variability observed at this location.

5.2.9 Despite the anomalous presence of DRO in the December 2012 round, there are no trends of concern in GRO or DRO at BH65A.

North-eastern Boundary Well

5.2.10 Borehole BH59A is situated up-gradient of the main excavation area, to the northeast of the LNG storage tanks and is characterised by:

- Rare occurrence of GRO in groundwater, with only three of twenty four analyses recording concentrations above the LOD. Occurs at low concentration when present in groundwater and does not exceed the LOD over the period 2010-2013.
- Only present in two of twenty-four samples analysed. Single anomalous occurrence in groundwater at historical maximum concentration (183 µg/l) in the December 2012 monitoring round.

5.2.11 No trend of concern for GRO or DRO, although anomalous DRO spike in December 2012 does require further monitoring at this location to determine if it is persistent.

2. Monitoring Wells South of the Main Excavation Area

5.2.12 Monitoring wells south of the main excavation area have historically included borehole BH45 and BHG2. These boreholes were reinstated in close proximity to their original locations following soil removal for site preparation earthworks, and renamed BH45A and BHG2A then BHG2B. (WSP, 2012). These boreholes have been stated to show significant improvement in water quality since reinstatement (WSP, 2012).

5.2.13 For this assessment additional boreholes thought to be located within the same groundwater sub-catchment have been included in this borehole group. Although historically associated with a position south of the main excavation area, these boreholes appear to be more closely

associated with westerly orientated groundwater flow from the area of high ground to the south east of the main excavation area.

Up-gradient Boreholes

5.2.14 Boreholes BHG2(A), BH18 and BH19 are characterised by high groundwater levels typically in excess of 33 m AOD and a corresponding high topographic elevation. These boreholes are located in the vicinity of a groundwater divide that separates westerly flow towards the valley of the skim pond and southwesterly groundwater flow to the coast (see *Appendix 5*).

5.2.15 Borehole BH18 has the highest groundwater level seen in this group, typically of between 40 to 42 m AOD. The groundwater quality at borehole BH18 is characterised by:

- General absence of GRO, with only a three of sixty four analyses recording concentrations at or above the LOD (maximum concentration 39 µg/l).
- Infrequent occurrence of DRO in groundwater (17% of samples analysed), but has been observed routinely in 2011 and 2012 although concentrations remain within historic variability. Elevated DRO concentration observed in December 2012 round although concentration is lower than historical maximum observed at this location.

5.2.16 It can be concluded that this GRO contamination is effectively absent from this location. Despite the anomalously elevated DRO concentration observed in the December 2012 monitoring round, concentrations appear to be stable with no trends of concern.

5.2.17 Borehole BH19 is also characterised by a high groundwater level of ca. 33 to 39 m AOD and defines a groundwater divide with BH18. Groundwater quality at borehole BH19 is characterised by:

- Rare occurrence of GRO in groundwater (in four of sixty-three analyses), with a low concentration (less than 35 µg/l) and general decreasing concentrations over time; and
- Occasional occurrence of DRO in groundwater throughout monitoring period at concentrations not exceeding 500 µg/l. Concentrations are typically stable and possibly declining since a maximum in December 2008.

5.2.18 It can be concluded that this GRO does not represent a contamination issue at this location and DRO concentrations are generally stable or possibly declining with no trend of concern identified.

5.2.19 Borehole BHG2B is also characterised by a high groundwater level of ca. 35 m AOD. Groundwater quality at BHG2B is characterised by:

- Rare occurrence of GRO in groundwater (four of sixty-three analyses), with a low concentration (less than 35 µg/l) and general declining trend when present; and
- More routine occurrence of DRO in groundwater. Declining trend since 2005 and largely absent from groundwater since mid-2009 with the exception of two occurrences at low concentration in mid 2012.

5.2.20 A declining trend is observed for both GRO and DRO, with very rare occurrence of GRO in groundwater.

Mid Flow Field Boreholes

5.2.21 Borehole BH40A, BH45B and BH01 are situated to the south of the main excavation area, but with a significantly lower groundwater levels and down hydraulic gradient position relative to the boreholes described previously.

5.2.22 Borehole BH40A is situated immediately down-gradient from the main excavation area, but could be considered the most up-stream member of Borehole Group 3 (i.e. upstream of the skim pond). However the contamination status of this location and its assumed position in the local groundwater flow field justifies its inclusion within this borehole group. Groundwater quality at borehole BH40A is characterised by:

- Rare occurrence of GRO in groundwater (i.e. three of fifty-two analyses), with a low concentration when present. Single occurrence at LOD (10 µg/l) over period 2010 ï 2013; and
- Occasional occurrence of DRO in groundwater (six of fifty-two analyses), typically at low concentration (below 420 µg/l). However, GRO is present in the last three monitoring rounds with an anomalously high concentration spike (6,150 µg/l) observed in most recent December 2012 monitoring round, suggesting possible rising trend.

5.2.23 Effectively no GRO contamination present at BH40A. The anomalous DRO spike in December 2012 suggests a possible rising trend over the last three monitoring rounds, although further confirmation of this trend is required.

5.2.24 Borehole BH45B is located to the south of borehole BH40A. No trend has been recorded for BH45B in the most previous trend analysis report (WSP, 2012). The chart in *Appendix 7* and summary tables in *Appendix 6* demonstrate that BH45B is characterised by:

- Rare occurrence of GRO in groundwater (two of forty-two analyses), with a low concentration (38 µg/l or LOD) and generally declining trend when present; and
- As seen at borehole BH40A, occasional occurrence of DRO in groundwater (six of forty-two analysis). However, DRO is present in last three monitoring rounds with an anomalously elevated concentration in most recent December 2012 monitoring round (224 µg/l) that suggests a possible rising trend.

5.2.25 Effectively no GRO contamination present at BH45B. As a possible rising trend in the concentration of DRO has been observed over the last three monitoring rounds, further monitoring of this trend is required.

5.2.26 Borehole BH01 has a very short dataset covering three sample rounds in 2012. No trend analysis is possible from this dataset and further monitoring is therefore required.

Down-gradient Boreholes

5.2.27 Borehole BH63A is the only borehole that can be considered to be in a down gradient position relative to the other boreholes in this group, being characterised by the lowest groundwater levels (typically between 7 and 9 m AOD) and closest proximity to the skim pond. Groundwater quality at borehole BH63A has a low contamination status, as seen in other boreholes in this group, being characterised by:

- Rare occurrence of GRO in groundwater (two of fifty analyses), with a low concentration of between LOD and 50 µg/l; and
- DRO only identified in a single analysis out of fifty and at the LOD.

5.2.28 Petroleum hydrocarbons are effectively absent from this location with no trends of concern identified.

3. Valley Area Up-stream of the Skim Pond

5.2.29 These boreholes are all situated at an upstream point within the central valley system and are all characterised by elevated groundwater levels.

Sludge Pit Boreholes

5.2.30 Borehole BH41A and BH42A were installed within a known area of contamination known as the sludge pit, where hydrocarbon contaminated sediments taken from the skim pond were historically deposited (WSP, 2012). This area was not subject to remediation and is characterised by the highest concentration of hydrocarbons identified on the site. The historical concentrations are commonly indicative of free phase hydrocarbon contamination at these locations, evidence of which has been observed on occasions during the monitoring of these locations (WSP, 2012).

5.2.31 Time series water quality data for BH41A are provided in *Appendix 7*, with the logarithmic chart being particularly informative. Groundwater quality at borehole BH41A is characterised by:

- Common occurrence of highly variable GRO concentrations in groundwater. Highest concentrations observed in late-2006 / early-2007 (ca 1.8 ï 40 mg/l) followed by continued declining trend to concentrations that now approach the limit of detection (i.e. 10 µg/l) and are stable or declining.
- Routine occurrence of DRO in groundwater. Rising trend in DRO concentration from 2005 up to a maximum of ca. 130 mg/l in 2007. General declining trend between 2008 and 2011, reaching minimum concentration of ca. 0.3 mg/l. Anomalous rise in DRO concentrations during 2011, followed by stable or declining concentrations in 2012 ï 2013, with a mean concentration of 2.2 mg/l in 2012.

5.2.32 A strong declining trend in the more volatile hydrocarbons (GRO) has been observed. Concentrations of DRO have declined from earlier historical maximum, but remain elevated and show a stable or declining trend. There are no trends of concern at this location.

5.2.33 Groundwater quality at BH42A is characterised by:

- Routine presence of GRO in groundwater and the highest GRO concentrations observed on site. Rise in GRO concentrations throughout 2008 and 2009, reaching a maximum of 690 mg/l in November 2009. Significant decline in concentrations during 2010 followed by a general declining trend to an annual mean of 0.134 mg/l in 2012.
- BH42A has the highest DRO concentrations observed on site. Routine presence of DRO in groundwater, rising to a maximum concentration of 740 mg/l in mid-2009. General decline in DRO concentration in late-2009, since when concentrations appear generally stable albeit variable.

5.2.34 A declining trend is apparent for the more volatile hydrocarbons (GRO) at BH42A. Concentrations of DRO are also stable or declining having reached the lowest annual mean concentration in 2012. Despite elevated concentrations of both DRO and GRO, there are no trends of concern at this location.

Down-stream of Sludge Pit

5.2.35 Borehole BH44 is located down-stream of the sludge pit, on the western side of the valley. Groundwater quality at borehole BH44 is characterised by:

- Very occasional occurrence of GRO in groundwater (six of seventy-one analyses). Highest GRO concentration in 2005 followed by decline in concentration (when present) to the LOD in 2012. GRO does not therefore represent a contamination issue at this location.
- Occasional occurrence of DRO in groundwater (seven of seventy analyses). Highest DRO concentration of 300 µg/l observed in January 2007. General decline in concentrations since maxima, with on three occurrences in 2011 and 2012 at concentrations of between the LOD and 52 µg/l. DRO does not therefore appear to represent a contamination issue at this monitoring location.

5.2.36 No contamination issue has been identified with respect to GRO. DRO appears to have shown a declining trend, with very low concentrations now observed. No trends of concern at this location.

Up-stream of Sludge Pit (Jet Hammer Blinds)

5.2.37 Borehole BH43 is located in an area up stream of the skim pond, in an area formerly described as the óJet Hammer Blindsô(WSP, 2012). In the previous trend analysis report, this location was assessed to have an increasing trend for GRO concentrations, although this conclusion seems questionable considering the variability (hence high standard deviation) associated with the dataset for this location. Time series water quality data for BH43 is shown *Appendix 7,*and tabulated summary data provided in *Appendix 6.* This data demonstrates that BH43 is characterised by:

- Highly variable and elevated GRO concentration pre-2009 with annual mean concentrations of between 176 ï 570 µg/l. Since 2009 PRO concentrations have decreased and become more stable at a concentration typically of less than 100 µg/l. Annual average concentrations demonstrate continual decline in concentrations, although now stabilising; and
- Elevated and highly variable DRO concentration 2005 and 2010, although maximum concentration typically varies between 0.5 - 2 mg/l. Particularly variable DRO concentration in 2010 / 2011, although concentrations appear to stabilise during the latter half of 2011 and 2012 with a concentration typically below 0.5 mg/l. Lowest annual mean concentration of 0.29 mg/l observed for 2012.

5.2.38 GRO and DRO concentrations have generally improved and now appear to be stable although absolute concentrations remain elevated. No trends of concern at this location.

4. Valley Area Down-stream of the Skim Pond:

5.2.39 Four boreholes are situated down-stream from the skim pond in the direction of the coastline. With the exception of BH34B these boreholes appear to lie on the axial groundwater flow line identified along the valley, beneath the skim pond and towards the coast. Groundwater levels typically decline from between 7 ï 8 m AOD at MW03 to 4 ï 5 m AOD at MW01.

MW03 – Up-gradient Location

5.2.40 Borehole MW03 is the most northern monitoring location in this group. Borehole MW03 was recently added to the monitoring network and has an extremely short dataset. GRO and DRO has been indentified in groundwater from this location with a maximum concentration of 14 µg/l and 214 µg/l respectively. No clear trends are apparent.

Borehole BH06

5.2.41 Borehole BH06 is situated immediately down gradient from MW03. No trends of concern have historically been identified at this location (WSP, 2012). Groundwater quality at BH06 is characterised by:

- Occasional occurrence of GRO in groundwater, exceeding the LOD in five of seventy analyses. GRO concentration is low when present, and has not exceeded the LOD of 10 µg/l in 2011 or 2012. General improvement in water quality with respect to GRO and no trend of concern; and
- More common occurrence DRO in groundwater (27% of seventy-two analyses). Maximum concentration in 2005, since when concentrations have been significantly lower and generally sable. Routine occurrence over period of 2011 ï 2013, albeit with a low and stable concentrations.

5.2.42 No trends of concern at BH06, with low and stable concentrations.

Borehole BH34

5.2.43 The previous trend analysis report (WSP, 2012) stated that the ñ*original borehole BH34 was replaced by BH34A in February 2008. BH34 had consistently recorded concentrations of below laboratory LOD's. BH34A was approximately 10 meters up-gradient from BH34*ò BH34A was characterised by ñ*high DRO concentrations*ò following reinstatement and ñ*due to there being no evidence of elevated concentrations 10m down-gradient, it is likely that BH34A is positioned within a localised area of residual contamination*ò Finally, ñ*BH34B replaced BH34A in January 2009 due to construction activities*òand BH34B was located in ñ*close proximity to BH34A*ò

5.2.44 The groundwater quality at borehole BH34 is characterised by:

- Pre-reinstatement as BH34A there is an absence of GRO and DRO in groundwater;
- Post-February 2008: Occasional occurrence of GRO in groundwater (thirteen out of sixty analyses) with low concentration approaching LOD;
- Post-February 2008: Very high DRO concentrations are observed routinely in groundwater with a maximum of 210 mg/l; and
- Significant decrease in DRO concentrations in mid-2008 since when DRO concentrations have been declining and now appear stable, with a mean annual concentration for 2012 of 0.18 mg/l.

5.2.45 General improvement in water quality with declining and stable concentrations for GRO and DRO respectively

MW01 – Down Gradient Location

5.2.46 MW01 is characterised by the lowest groundwater levels of this group, typically ranging between 4 ï 5 m AOD. This reflects the coastal location of this borehole, but is surprising high considering the proximity of this borehole to the coastline. The chart in *Appendix 7* and the summary tables in *Appendix 6* demonstrate that MW01 is characterised by:

- Relatively short dataset with low concentrations and possible declining trend in GRO; and
- Relatively short dataset with low concentrations and possible declining trend in DRO.

5.2.47 No trends of concern have been identified at this location.

Additional Comment

5.2.48 It should be noted that the data for all monitoring locations within Borehole Group 4 do not provide evidence for the lateral (down hydraulic gradient) transport of petroleum hydrocarbons along the axis of the skim pond valley towards the coastline.

5. Process Area

5.2.49 Boreholes BH60B and BH61A are located within the main process area on the site, in positions that appear to up hydraulic gradient from the main excavation area. The water quality dataset for these boreholes was not reviewed in the previous trend analysis report produced for the site.

5.2.50 Groundwater quality at BH60B is characterised by:

- The absence of GRO and general absence of DRO pre-2009;
- Following reinstatement in 2008, occasional occurrence of GRO with maximum concentration of 46 µg/l and subsequent decline to the LOD or below the LOD. GRO at or below LOD over period 2010-2013. GRO does not appear to be a contaminant of concern at this location; and
- Following 2008, occasional occurrence of GRO with a maximum concentration of 600 µg/l at the end of 2008, followed by subsequent decline to below the LOD in 2010, 2011 and 2012. Anomalous reappearance of DRO in December 2012 although concentration of 132 µg/l remains within historical variability.

5.2.51 General improvement in water quality at this location with no trends of concern identified. However anomalous presence of DRO at this location in December 2012 demands further monitoring.

5.2.52 Groundwater quality at borehole BH61A is characterised by:

- General absence of GRO and DRO before mid-2008;
- More routine occurrence and possible rising trends in GRO and DRO during 2011 and 2012, with maximum concentrations for GRO and DRO over this period of 1640 µg/l and 1690 µg/l respectively; and
- Variable GRO concentrations in period since mid-2011, but possible rising trend in DRO.

5.2.53 A possible rising trend has been identified DRO at this location.

6. Nature Conservation Area (NCA)

Southern NCA

5.2.54 Boreholes BH49, BH50 are located in the southern NCA in close proximity to the coastal site boundary around the fort. No trends of concern have historically been reported for either location although DRO and GRO is historically been observed in groundwater from borehole BH50.

5.2.55 Groundwater quality at borehole BH49 is characterised by:

- Rare occurrence of GRO in groundwater from BH49 (two of twenty-six analyses) and only single occurrence at LOD in 2010 to 2012. GRO is not a contaminant of concern at this location; and
- Elevated DRO pre-2007 with maximum concentration of 400 µg/l. Low concentration and infrequent occurrence since 2007. Anomalous reappearance of DRO in December 2012 albeit at concentration below historical maximum.

5.2.56 With the exception of the anomalous DRO presence in the December 2012, DRO and GRO do not appear to represent an ongoing contamination issue at this location, with no trends of concern identified.

5.2.57 The charts and tables in *Appendix 7* and *Appendix 6*, respectively indicate that groundwater quality at borehole BH50 is characterised by:

- Routine presence of GRO and DRO in groundwater from BH50. Decline in the measured concentrations from maximum in 2006 / 2007 of ca. 3,000 µg/l. Annual average data suggest possible rise in concentration during 2011 and 2012, although observed concentrations are more variable.

5.2.58 Annual average concentration data for borehole BH50 suggests a possible increasing trend in DRO and GRO concentration in groundwater during in 2012. However, concentration variability is more pronounced and the mean concentration observed in 2012 is significantly lower than the historical maximum in 2006 / 2007. It is noted that low concentrations of DRO and GRO have been identified on occasions in Spring 5 (see *Section 5.4*), that is situated in southeast of the site in relatively close proximity to borehole BH50.

Mid NCA

5.2.59 Borehole BH53A is located within the centre of the NCA, in close proximity to the western coastal site boundary. Groundwater flow at this location is thought to be oriented towards the coast, away for an assumed divide passing through the process area. groundwater quality at borehole BH53 is characterised by:

- Elevated GRO in early 2005, followed by significant decline and general absence in 2010, 2011 and 2012. DRO no longer appear to a contaminant of concern at this location; and
- DRO has only been observed on 3 occasions in groundwater from BH53 out of twenty-nine analyses. DRO does not appear to be ac contaminant of concern at this location, although there was an anomalously high occurrence of DRO in the December 2012 monitoring round.

5.2.60 Although GRO and PRO do not generally appear to be an issue at this location, the anomalous occurrence of DRO in December 2012 requires further monitoring.

Northern NCA

5.2.61 Borehole BH20 and BH22 are located in the northern end of the NCA. Borehole BH20 is located along the western coastal site boundary, whereas BH22 is located towards the northern site boundary adjacent to Jacks Pool. BH22 is characterised by a particularly high groundwater levels elevation for the site, typically between 46 - 48 m AOD. Both boreholes show similar trends in groundwater quality that are characterised by:

- Infrequent occurrence of GRO and DRO in groundwater and general improvement (declining trend when present); and
- Anomalous occurrence of elevated DRO in the December 2012 monitoring round.

5.2.62 Although GRO and PRO do not generally appear to be an issue at these locations the anomalous occurrence of DRO in December 2012 requires further monitoring.

7. High Ground to the West of Skim Pond

5.2.63 Borehole BH47A is the only borehole located on high ground to the west of the skim pond. Groundwater levels are relatively low but highly variable, typically ranging between 14 m AOD and 26 m AOD. Groundwater quality at borehole BH47A is characterised by:

- General absence of GRO and DRO in groundwater before 2008, with the exception of a single occurrence of GRO at a (maximum) concentration of 570 µg/l in April 2007;
- Declining concentrations of GRO since 2009 with concentrations now at or below the LOD. GRO does not therefore appear to represent a contaminant of concern at this location;
- Maximum DRO concentration of 550 µg/l observed in April 2009, followed by infrequence occurrence an significant decline in concentrations; and
- Anomalously elevated concentration of DRO in the December 2012 monitoring round, which although less that the historic maximum for this source suggests a possible rising trend.

5.2.64 Although GRO does appear to be an issue at this location. However a possible rising trend in DRO has been observed although concentrations remain within historical variability.

8. Northern Site Boundary

5.2.65 Boreholes BH26, BH27A, BH55 are all located on the northern site boundary. These boreholes are characterised by high groundwater levels and are though to mark points of off-site to on-site groundwater flow. All locations show similar trends characterised by:

- Infrequent occurrence of GRO and DRO typically at low concentration, with stable or declining concentrations when present in groundwater; and
- Anomalous occurrence of DRO in groundwater in the December 2012 monitoring round.

5.2.66 Although there are no trends of concern associated with these locations, further monitoring is required to address the anomalous DRO concentrations observed in December 2012.

Summary of Trend Analysis

5.2.67 A detailed description of the trend analysis and recommendations is provided in the table contained in *Appendix 8*, and is summarised in *Table 5.2* and *Table 5.3*.

Table 5.2 Summary of Trend Analysis (Inside Green Fence)

Borehole ID	Monitoring Frequency	Parameter	Trend Summary (February 2012)	Trend Summary (March 2013)
BH34b	Monthly	GRO	No Trend Identified	Decreasing
		DRO	Decreasing	Decreasing
BH41a	Monthly	GRO	Decreasing	Decreasing
		DRO	Decreasing	Decreasing
BH42a	Monthly	GRO	Increasing	No Trend of Concern
		DRO	Increasing	No Trend of Concern
BH43	Monthly	GRO	Increasing	Decreasing
		DRO	Increasing	No Trend of Concern
BH06	Quarterly	GRO	No Detectable Contamination	No Trend of Concern
		DRO	No Detectable Contamination	No Trend of Concern
BH44	Quarterly	GRO	Decreasing	No Trend of Concern
		DRO	No Detectable Contamination	No Trend of Concern
MW01	Quarterly	GRO	-	No Trend of Concern
		DRO	-	No Trend of Concern
MW03	Quarterly	GRO	-	No Trend of Concern
		DRO	-	No Trend of Concern
BH30a	6-Monthly	GRO	No Detectable Contamination	No Detectable Contamination
		DRO	Decreasing	No Detectable Contamination
BH40a	6-Monthly	GRO	No Detectable Contamination	No Detectable Contamination
		DRO	No Detectable Contamination	Possible Increasing (Dec-12 Spike)
BH45b	6-Monthly	GRO	No Detectable Contamination	No Detectable Contamination
		DRO	No Detectable Contamination	Possible Increasing (Dec-12 Spike)
BH63a	6-Monthly	GRO	-	No Detectable Contamination
		DRO	-	No Detectable Contamination
BHG2b	6-Monthly	GRO	Decreasing	Decreasing
		DRO	Decreasing	Decreasing

Table 5.3 Summary of Trend Analysis (Outside of Green Fence)

Borehole ID	Parameter		Trend Summary (February 2012)	Trend Summary (March 2013)
BH50	Quarterly	GRO	No Trend Identified	Possible Increasing
		DRO	No Trend Identified	Possible Increasing
BH01	6-Monthly	GRO	-	No Trend of Concern
		DRO	-	No Trend of Concern (Dec-12 Spike)
BH18	6-Monthly	GRO	No Detectable Contamination	No Detectable Contamination
		DRO	Decreasing	No Trend of Concern (Elevated Dec-12)
BH19	6-Monthly	GRO	No Detectable Contamination	No Trend of Concern
		DRO	No Detectable Contamination	No Trend of Concern
BH20	6-Monthly	GRO	No Detectable Contamination	No Trend of Concern
		DRO	No Detectable Contamination	No Trend of Concern (Dec-12 Spike)
BH22	6-Monthly	GRO	No Detectable Contamination	No Trend of Concern
		DRO	No Detectable Contamination	No Trend of Concern (Dec-12 Spike)
BH26	6-Monthly	GRO	Decreasing	No Trend of Concern
		DRO	No Detectable Contamination	No Trend of Concern (Dec-12 Spike)
BH27a	6-Monthly	GRO	No Detectable Contamination	No Trend of Concern
		DRO	No Detectable Contamination	No Trend of Concern
BH36b	6-Monthly	GRO	Decreasing	No Trend of Concern
		DRO	Decreasing	No Trend of Concern
BH47a	6-Monthly	GRO	-	No Trend of Concern
		DRO	-	Possible Increasing (Elevated Dec-12)
BH49	6-Monthly	GRO	No Detectable Contamination	No Trend of Concern
		DRO	No Detectable Contamination	No Trend of Concern (Elevated Dec-12)
BH53	6-Monthly	GRO	No Detectable Contamination	No Trend of Concern
		DRO	Decreasing	No Trend of Concern (Dec-12 Spike)
BH55	6-Monthly	GRO	No Detectable Contamination	No Trend of Concern
		DRO	No Detectable Contamination	No Trend of Concern (Dec-12 Spike)
BH59	6-Monthly	GRO	No Detectable Contamination	No Trend of Concern
		DRO	No Detectable Contamination	No Trend of Concern (Dec-12 Spike)
BH60b	6-Monthly	GRO	-	No Trend of Concern
		DRO	-	No Trend of Concern
BH61a	6-Monthly	GRO	-	No Trend of Concern (Elevated Dec-12)
		DRO	-	Possible Increasing (Dec-12 Spike)
BH65	6-Monthly	GRO	-	No Trend of Concern
		DRO	-	No Trend of Concern (Elevated Dec-12)

5.2.68 The principal conclusion that can be drawn from the trend analysis for Total GRO and Total DRO include:

- Majority of monitoring locations have demonstrated a significant improvement in water quality since completion of the remediation and/or construction phase of SHLNG terminal site;
- The majority of locations are characterised by stable or declining trends over recent years or petroleum hydrocarbons do not appear to be a contaminant of concern;
- Boreholes BH40a, BH45b, BH47a and BH61a appear to indicate recent rising trends, although a these locations are influenced by the anomalous occurrence of DRO observed across much of the site during the December 2012 monitoring round;
- Borehole BH50 appears to show a possible recent rising trend on the basis of the annual average concentration data for this location. However, the measured concentration variability between measurements has also increased and the observed mean concentration observed in 2012 is significantly lower than the historical maximum observed in 2006 / 2007
- An anomalous presence of DRO was observed in many boreholes during the December 2012 monitoring round; and
- Monitoring locations within Borehole Group 4 do not provide evidence for the lateral (down hydraulic gradient) transport of petroleum hydrocarbons along the axis of the skim pond valley towards the coastline.

5.2.69 When compared with the previous trend analysis for 2012, it can be seen that most locations that previously demonstrated a declining trend continue to show a declining trend or no trend of concern. With the exception of BH50 described above, the other monitoring locations are characterised by no detectable contamination or no trend of concern except where they have been affected by anomalous spike in concentrations observed in December 2012 monitoring round.

5.3 Groundwater Quality: Semi Volatile Organic Compounds

5.3.1 The concentration of SVOCs in groundwater is not recorded on the database supplied to RPS by WSP. This assessment is therefore based on the dataset gathered by RPS in 2012 which includes data for a total of six boreholes monitored on a monthly or quarterly basis, namely:

- Monthly Monitoring: BH34, BH41A, BH42A and BH43; and
- Quarterly Monitoring: MW01 and MW02.

5.3.2 These boreholes are typically located up-stream of the skim pond in the most contaminated boreholes sampled on the site (BH34, BH41A, BH42A and BH43). The concentration of SVOCs identified in groundwater from these boreholes at concentrations in excess of the analytical Limit of Detection (LOD) are summarised in *Table 5.4* overleaf.

Table 5.4 Summary of SVOCs in Groundwater (RPS Data for 2012)

Location	Date of Monitoring Round	2-Methylnaphthalene (µg/l)	Acenaphthene (µg/l)	bis(2-Ethylhexyl) phthalate (µg/l)	Fluorene (µg/l)	Naphthalene (µg/l)	Phenanthrene (µg/l)	Pyrene (µg/l)	bis(2-Chloroethoxy) methane (µg/l)	2,4-Diitrotoluene (ug/l)
BH34	Oct-12	-	-	3.66	-	-	-	-	-	-
	Nov-12	-	-	-	-	-	-	-	-	-
	Dec-12	-	-	-	-	-	-	-	-	-
BH41A	Oct-12	-	-	-	-	-	-	-	-	-
	Nov-12	-	-	-	-	-	-	-	-	-
	Dec-12	-	-	-	-	-	-	-	-	-
BH42A	Oct-12	57.9	3.29	-	6.4	23.4	12.4	2.24	-	-
	Nov-12	-	2.4	-	-	-	6.73	1.81	1.5	-
	Dec-12	9.53	1.07	-	2.16	3.13	3.25	-	-	1.75
BH43	Oct-12	-	-	-	-	-	-	-	-	-
	Nov-12	-	-	-	-	-	-	-	-	-
	Dec-12	-	-	-	-	-	-	-	-	-
MW01	Oct-12									
	Nov-12									
	Dec-12	-	-	-	-	-	-	-	-	-
MW02	Oct-12									
	Nov-12									
	Dec-12	-	-	-	-	-	-	-	-	-

5.3.3 The presence of SVOCs in groundwater is restricted to the most contaminated borehole on the site, namely BH42A, situated within the former Sludge Pit area. Despite the extremely high concentration of petroleum hydrocarbons characteristic of BH42A, only a small number of SVOCs (principally Polycyclic Aromatic Hydrocarbons) have been identified and concentrations are low, typically below 10 µg/l. These results are not indicative of a significant SVOC (or PAH) contamination in groundwater on the site, although the dataset available for BH42A is short and hence trend analysis is not possible.

5.4 Springs Monitoring Results

5.4.1 Seven springs are monitored along the coastal boundary of the site at the locations shown in *Drawing JER5575U-001b*. The groundwater contour plots provided in *Appendix 5* suggest the following:

- *Spring 1 and Spring 2*: Situated on the western coastline and is likely to derive groundwater flow from the northern NCA being situated down-gradient of the groundwater divide separating groundwater flow towards the western coastal boundary and the SHLNG Terminal site. Spring 1 and 2 are situated approximately down-gradient of borehole BH53 that is now characterised by a low contamination status although elevated GRO was identified before 2010;
- *Spring 3 and Spring 4:* Situated on the eastern coastline, to the south of Spring 1 and Spring 2. Likely to receive groundwater from the central part of the NC being situated down-gradient of the north-south divide separating groundwater flow towards the western coastal boundary and the SHLNG Terminal site / skim pond valley;
- *Spring 5*: Situated on the south-western corner of the coastline and is likely to receive groundwater from southern NCA being situated down-gradient of the divide that separates groundwater flow to the western / southern coastal boundary and the skim pond valley. Spring 5 is situated down hydraulic gradient of borehole BH50 that is characterised by elevated GRO and DRO concentrations, with mean concentration in groundwater from BH50 of ca. 1,900 µg/l for both parameters in 2012;
- *Spring 6:* Situated on the coastal boundary, immediately south of the central part of the skim pond valley. Spring 6 is located down hydraulic gradient from Borehole Group 4 (Valley area down-stream of skim pond) along the region of presumed axial groundwater flow to the coastline. Although BH34A is characterised by significant contamination this is not reflected at MW01 situated down-stream thereof; and
- *Spring 7*: Situated on the southern coastal boundary near the south-east corner Terminal site boundary. This spring appear to be located on the opposite side of the groundwater divide beneath high ground to the east of the skim pond valley and the location of Borehole Group 2 (Monitoring well south of the Main Excavation Area).

5.4.2 It should be noted that although the groundwater catchments contributing to each spring have been determined on the basis of the groundwater contour plots, it is possible that discrete spring

discharges may relate to preferential fracture flow paths that may not reflect the topographically driven groundwater flow system indicated from the site specific groundwater level dataset.

5.4.3 Time series water quality charts for the charts spring monitoring are provided in *Appendix 10*. The groundwater monitoring dataset provided by WSP only provided monitoring data for the period of 2005 to 2009, inclusive. However in the most previous trend analysis report it is stated that WSP have undertaken 18 spring monitoring rounds ñ*April 2005 and April 2012*ò

5.4.4 The time series charts demonstrate that from a sample dataset of ca. 18 analyses GRO and DRO occur infrequently in spring groundwater, with the following occasional spikes:

- Spring 1
  - GRO: September 2009 (46 µg/l)
  - DRO: March 2008 (200 µg/l)
- Spring 2
  - GRO: September 2009 (35 µg/l)
- Spring 3
  - GRO: March and September 2009 (30 µg/l and 46µg/l);
- Spring 4
  - GRO: September 2009 (34µg/l);
- Spring 5
  - GRO: March and September 2009 (31 µg/l and 36µg/l)
  - DRO: March, June and September 2006 (100 µg/l, 300 µg/l and 100 µg/l)
- Spring 6
  - GRO: September 2009 (32 µg/l)
  - DRO: March 2009 (110 µg/l)
- Spring 7
  - GRO: September 2009 (33 µg/l)
  - DRO: March 2009 (130 µg/l)

5.4.5 More mobile, short chain GRO is the most common contaminant identified in spring water, although there no trends of concern identifiable from the data presented in the charts of *Appendix 10*.

5.4.6 The analytical results for the 2012 spring monitoring round have been obtained and are provided in *Appendix 11.* This data demonstrates that no petroleum hydrocarbons or BTEX compounds (i.e. benzene, toluene, ethylbenzene and xylenes) were present in any of the seven springs monitored on the site in April 2012. In line with previous report, it can be concluded that there are no trends of concern with respect to the contaminants of concern in spring groundwater.

5.5 Other Considerations

December 2012 Monitoring Round

5.5.1 An anomalous presence of elevated concentrations of DRO was observed at fourteen monitoring locations during the December 2012 monitoring round, of which eleven represented the highest concentration measured at the respective location. The elevated DRO concentration appeared to an anomalous site wide concentration ñspikeò observed at seven locations (namely BH01, BH20, BH22, Bh26, BH53, BH55 and BH59) and at three locations the elevated DRO concentration is within historical variability (BH65, BH49 and BH18).

5.5.2 The occurrence of elevated DRO during this 6-monthly monitoring round could not be attributed to sampling protocols considering:

- The QA / QC measures undertaken to prevent cross contamination (as discussed previously); and
- DRO was observed in both the pre-purge and post-purge samples despite the samples being taken using different sampling approaches (i.e. clean bailer and whale pump respectively).

5.5.3 Laboratory analysis of selected duplicate samples was therefore undertaken. These additional analyses confirmed the presence of DRO in duplicate groundwater samples. The presence of DRO in: the original and duplicate samples; and in purge and non-purge samples taken by different approaches strongly suggests that the observed occurrence of DRO in December 2012 is a real event.

5.5.4 Although the cause of this anomalous DRO occurrence remains uncertain it is possible that it relates to the unusual climatic conditions (principally rainfall) encountered during 2012 and exacerbated by the lower limits of detection used by the laboratory for analysis relative to historical monitoring rounds. Further monitoring of all boreholes that exhibit anomalous DRO concentrations has therefore been recommended and the trend analysis for affected boreholes shall be reviewed following the collection the 2013 dataset. This December 2012 site wide óspikeôin hydrocarbon concentrations is therefore considered highly anomalous single event that os not reflected in the long term dataset for the site..

Purge vs Non-Purge Samples

5.5.5 An assessment of the difference in groundwater quality data obtained for pre-purge and post purge sample analysis has been undertaken for selected boreholes. This data is presented in *Appendix 9* and demonstrates:

- Extremely large difference and variability in the pre-purge and post purge sample quality; and
- No systematic variation in measured concentrations measured in pre-purge and post purge samples.

5.5.6 These results demonstrate that there is little value in taking both pre-purge and post purge samples, when trend analysis is only undertaken of the ñpurgedò samples.

Quality Assurance and Quality Control

5.5.7 This assessment has reinforced the need for robust QA and QC procedures during each sample round. In particular, the value of taking duplicate samples has been reinforced and the need for taking field blanks and/or equipment blanks supported.

6 Pond Levels on the Nature Conservation Area

6.1 Monitoring Regime

6.1.1 The water level within eight ponds located in the Nature Conservation Area has recorded as part of routine monitoring on the SHLNG Terminal Site since at least 2005. The degree of hydraulic continuity between the ponds and surrounding groundwater is unknown. The monitoring of pond levels was therefore initiated to determine whether any excavation works and/or site dewatering has resulted in any measurable effects upon pond levels.

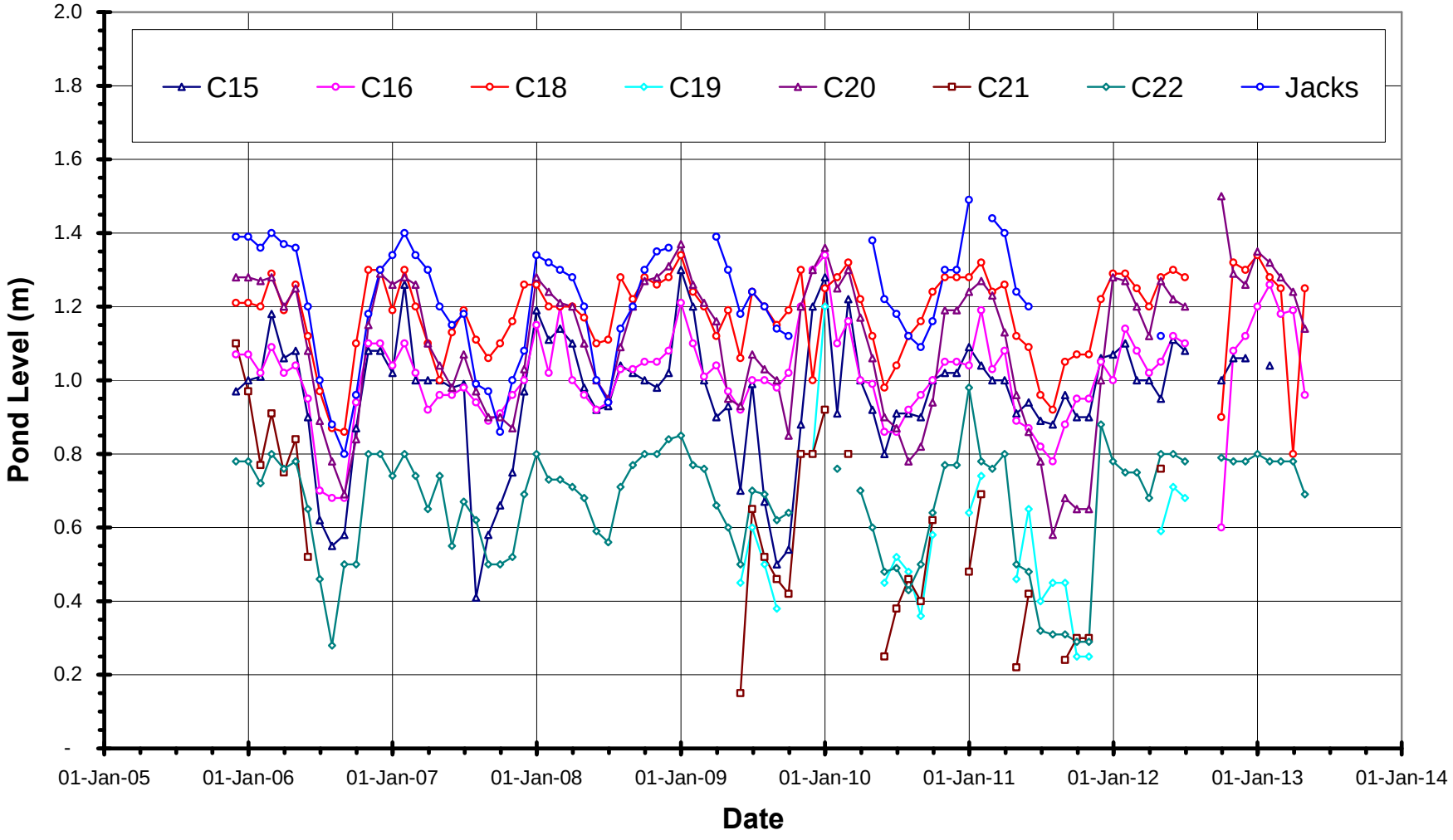
6.1.2 Pond level measurements have typically been taken on a monthly basis, using free standing marker boards installed within each pond. Water level measurements are therefore made in metres as the marker boards have not been surveyed to Ordnance Datum.

6.2 Results

6.2.1 Water levels measured within the ponds on the NCA are summarised in *Figure 6.1*. Pond levels show a characteristic summer recession, but have been particularly high in 2012 owing to the high rainfall that summer.

6.2.2 There is no evidence of adverse effects on pond levels on the site. This supports the conceptual assumption that the ponds are principally rainfall dependent perched features with no direct hydraulic continuity with groundwater and/or the subsurface.

Figure 6.1 Measured Pond Levels Within the NCA



7 Summary & Recommendations

7.1 Summary

7.1.1 The South Hook LNG Terminal site is the former location of an oil refinery that was subject to major investigation and remediation between 1993 and 2005. Routine monitoring was commenced on the site in 2005 and has commenced to date. A detailed review of the entire groundwater monitoring dataset gathered on the Terminal site has been undertaken with the objective of providing recommendations for ongoing monitoring on the site.

7.1.2 The Conceptual Hydrogeological Model has been reviewed and updated in accordance with the additional monitoring data gathered for the site and is summarised below:

- Devonian bedrock of the Milford Haven Group represents the principal water bearing unit on the site that constitutes fractured aquifer system designated a Secondary A aquifer unit by the EAW / NRW.
- The fractured bedrock aquifer is largely unconfined and characterised by low storage, quick response to rainfall events and steep hydraulic gradients that reflect the steep surface topography;
- The fractured bedrock is overlain by a variety of superficial deposits that included weathered bedrock, reworked natural ground and Made Ground;
- Superficial deposits may be water bearing but do not form laterally extensive aquifer units in their own right;
- The water table in the bedrock aquifer reflects surface topography with groundwater divides beneath areas of high ground and groundwater flow orientated towards the coastal boundary, dewatered main excavation area in the centre of the site and the Skim Pond valley;
- The degree of groundwater-surface water interaction with the skim pond is uncertain, although a significant axial flow of groundwater along the valley to the coastline is expected; and
- The coastal boundary is expected to represent the hydraulic minimum to the local groundwater system and is the therefore the ultimate receptor of groundwater on the site.

7.1.3 The principal contaminants of concern historically identified on the site are petroleum hydrocarbons associated with the former refinery on the site. These contaminants have historically been analysed as Total Gasoline Range Organics and Total Diesel Range Organics. SVOCs have been monitored at a total of 6 locations on either a monthly or quarterly basis.

7.1.4 The trend analysis is based on the Total GRO and Total DRO concentration results for ñpurgedò samples. The outcome of the trend analysis is summarised in Table 5.2 and Table 5.3, and presented on *Drawing JER5575U-005*

7.1.5 The principal conclusions of the trend analysis include:

- The majority of monitoring locations have demonstrated an improvement in water quality since completion of the remediation and/or construction phase of SHLNG terminal site;
- The majority of locations are characterised by stable or declining trends over recent years or petroleum hydrocarbons no longer appear to be a contaminant of concern.
- Boreholes BH40a, BH45b, BH47a, BH61a and BH50 appear to indicate possible rising trends in recent data, although a number of these locations are influenced by the anomalous occurrence of DRO observed at many locations during the December 2012 monitoring round.
- The groundwater quality data for all monitoring locations within Borehole Group 4 provide no evidence for the lateral (down hydraulic gradient) transport of petroleum hydrocarbons along the axis of the skim pond valley towards the coastline.

7.1.6 SVOCs have only been identified in the most contaminated borehole monitored on the site (BH42A) and occur at low concentration for a number of parameters (principally PAHs).

7.1.7 Although the spring monitoring dataset is limited, no trends of concern have been identified which is consistent with the conclusion presented in previous trend analysis reports.

7.2 Recommendations

Pond Level Measurement

7.2.1 If continued monitoring of pond levels on the NCA is to be included as part of routine monitoring on the site it is recommended that marker boards are surveyed in to Ordnance Datum and a permanent reference datum established with the NCA to allow re-surveying of gauge boards that have been

Groundwater Monitoring Frequencies

7.2.2 On the basis of the trend analysis presented herein a number of modifications to the current monitoring regime are justified. A summary of the proposed modifications to the current monitoring regime are provided in *Table 7.1*.

Table 7.1 Recommended Variation to Monitoring Regime

Borehole Group	Borehole ID	Position in Group	Current Monitoring Regime		PROPOSED (Revised) MONITORING REGIME		
			Monitoring Frequency	Monitoring Suite	Monitoring Frequency	Monitoring Suite	Justification & Notes
1. Main Excavation Boundary Wells	BH30a	Eastern Boundary Wells	6-Monthly	DRO; GRO.	-	-	No issue at this location. Already 6-monthly sampling.
	BH36b	Eastern Boundary Wells	6-Monthly	DRO; GRO.	-	-	No trends of concern. Review at end of 2013.
	BH65	Northern Boundary Well	6-Monthly	DRO; GRO.	-	-	Demonstrate absence of DRO. Reconsider after trend analysis at end of 2013.
	BH59	Northern-eastern Boundary Well	6-Monthly	DRO; GRO.	-	-	Demonstrate absence of DRO. Reconsider after trend analysis at end of 2013.
2. Monitoring Wells South of Main Excavation Area	BH18	Up-gradient	6-Monthly	DRO; GRO.	-	-	Continue to determine trends in DRO. Review monitoring frequency after collection of another years data.
	BH19	Up-gradient	6-Monthly	DRO; GRO.	-	-	Continue to determine trends in DRO.
	BHG2b	Up-gradient	6-Monthly	DRO; GRO.	-	--	Confirm stability or continued declining trend
	BH01	Mid-flow field	6-Monthly	DRO; GRO.	-	-	Improve dataset and monitoring DRO rise
	BH40a	Mid-flow field	6-Monthly	DRO; GRO.	Quarterly	-	Increase frequency for ***1 year*** to confirm or otherwise anomalous recent trend in DRO.
	BH45b	Mid-flow field	6-Monthly	DRO; GRO.	Quarterly	-	Increase frequency for ***1 year*** to confirm or otherwise anomalous recent trend in DRO.
	BH63a	Down-gradient	6-Monthly	DRO; GRO.	-	-	Effectively absent from groundwater. No trends of concern. Long dataset.
3. Valley Area Up-stream of Skim Pond	BH41a	Sludge Pit	Monthly	DRO; GRO; SVOCs	Quarterly	-	Owing to STABLE or DECLINING trends during operational phase.
	BH42a	Sludge Pit	Monthly	DRO; GRO; SVOCs	Quarterly	-	Although concentrations remain high, concentrations have decreased during operational phase and are now STABLE or DECLINING
	BH43	Up-stream of Sludge Pit	Monthly	DRO; GRO; SVOCs	Quarterly	-	Significant decrease in concentrations observed during operational phase, with lower concentrations that are now STABLE or declining.
	BH44	Down-stream of Sludge Pit	Quarterly	DRO; GRO.	6-Monthly	-	No trends of concern. Reduce monitoring frequency

Table 7.1 Recommended Variation to Monitoring Regime (Continued)

Borehole Group	Borehole ID	Position in Group	Current Monitoring Regime		PROPOSED (Revised) MONITORING REGIME		
			Monitoring Frequency	Monitoring Suite	Monitoring Frequency	Monitoring Suite	Justification & Notes
4. Valley Area Down-Stream of Skim Pond	MW03	-	Quarterly	DRO; GRO; SVOCs	-	DRO; GRO	No VOCs observed in RPS monitoring rounds
	BH06	-	Quarterly	DRO; GRO.	6-Monthly	-	Due to low frequency of occurrence and low concentrations, move to six-monthly sampling.
	BH34b	-	Monthly	DRO; GRO; SVOCs	Quarterly	-	Significant decrease on concentration from 2009 / 2010. With stable or declining trends.
	MW01	-	Quarterly	DRO; GRO; SVOCs	-	DRO; GRO	No VOCs observed in RPS monitoring rounds. Continue quarterly monitoring until we have x year dataset.
5. Process Area	BH60b	-	6-Monthly	DRO; GRO.	-	-	No trend of concern identified
	BH61a	-	6-Monthly	DRO; GRO.	Quarterly	-	Increase frequency for 1 year to monitor possible rising trend.
6. Nature Conservation Area (NCA)	BH49	Southern NCA	6-Monthly	DRO; GRO.	-	-	-
	BH50	Southern NCA	Quarterly	DRO; GRO.	-	-	Continue to monitoring recent trends.
	BH53	Mid NCA	6-Monthly	DRO; GRO.	-	-	Demonstrate absence of DRO. Reconsider after trend analysis at end of 2013.
	BH20	Northern NCA	6-Monthly	DRO; GRO.	-	-	Continue to monitor for trends in DRO and PRO during 2013. Reconsider after trend analysis at end of 2013.
	BH22	Northern NCA	6-Monthly	DRO; GRO.	-	-	Continue to monitor for trends in DRO during 2013. Reconsider after trend analysis at end of 2013.
7. High Ground to West of Skim Pond	BH47a	-	6-Monthly	DRO; GRO.	-	-	Continue to monitor for trends in DRO during 2013. Reconsider after trend analysis at end of 2013.
8. Northern Site Boundary	BH26	-	6-Monthly	DRO; GRO.	-	-	Continue to monitor for trends in DRO during 2013. Reconsider after trend analysis at end of 2013.
	BH27a	-	6-Monthly	DRO; GRO.	-	-	No trends of concern. Review at end of 2013.
	BH55	-	6-Monthly	DRO; GRO.	-	-	Demonstrate absence of DRO. Reconsider after trend analysis at end of 2013.

7.2.3 A principal assumption of these recommendations is that 6-monthly monitoring represents the minimum acceptable monitoring frequency at a site where uncertain seasonal / climatic relationships with contaminant occurrence / concentration exist. Although a number of locations situated outside of the green fence appear to show no significant contamination issue or trends of concern, these locations have been retained at a 6-monthly monitoring frequency.

7.2.4 A move from monthly monitoring to quarterly monitoring is recommended for all boreholes situated within the green fence considering the long monitoring dataset gathered to date and the absence of any trends of concern. This includes borehole BH41a, BH42a, BH43 in valley area up-stream of the skim pond (Borehole Group 3) and BH34b.

7.2.5 In contrast a move from 6-monthly to quarterly monitoring has been recommended for three locations where possible rising trends have been observed. This includes BH40a and BH45b to the south of the main excavation area (Borehole Group 2) and borehole BH61a in the main process area (Borehole Group 5).

7.2.6 A move from quarterly monitoring to 6-monthly monitoring has been recommended for boreholes that have shown: a significant improvement in water quality followed by stability; a sustained declining trend over recent years; and/or locations where petroleum hydrocarbons no longer appear to be a real contaminant of concern. These criteria are met at BH44 and BH06.

Groundwater Monitoring Suite

7.2.7 No change to the principal petroleum hydrocarbon analytical suite is recommended. A continuation of monitoring for banded DRO and GRO (including totals) shall be adopted for all locations.

7.2.8 Although the SVOC dataset reviewed herein is short, it is recommended that SVOCs is no longer monitored at borehole MW01 or MW02. This is justified by their absence at these locations in all monitoring round to date, the absence of location-specific reason for monitoring SVOCs at these location and the recent addition of these location to the monitoring network.

Groundwater Sampling Approach

7.2.9 Groundwater samples have been taken on the SHLNG Terminal site since 2004 using the same sampling methodology. Monitoring locations situated within the green fence are sampled by bailer, following the removal of a nominal 20 bailer volumes. In contrast monitoring locations situated inside the green fence are sampled using a submersible pump following the purging of ca.1 well volume.

7.2.10 By using a consistent sampling approach throughout the groundwater monitoring period an apparent re-assurance regarding the continuity of results is provided. Potential improvements in the sampling approach used on site have been identified by identified by RPS. However any change to the sampling method used on site does have the potential to result in inconsistency with the historical dataset. As the Landlord has not expressed any concern regarding sampling methodology with respect to the monitoring regime on the site, it is recommended that SHLNG

Terminal Co. Ltd. maintain the existing sampling methodology but alternative approaches are trialled on the site. Modification to the sampling methodology to be considered include:

- *Inside Green Fence* - Low flow sampling using borehole specific bladder pumps and compressed air system; and
- *Outside Green Fence* - 3-well volume purging using submersible pump.

7.2.11 RPS recommends further dialogue with SHLNG Terminal Co. Ltd. regarding this matter.

7.2.12 No clear coherent or reproducible relationship can be established between the ñpre-purgeò and ñpost-purgeò samples currently taken on the site. Furthermore the pre-purge samples are not used to inform the trend analysis undertaken by RPS and previous incumbent consultants. It is therefore recommended pre-purge samples are no longer taken and analysed during each monitoring round.

7.2.13 The value of the duplicate (post purge) samples has been demonstrated and it is recommended that these duplicate samples are continued to be taken during each monitoring round.

7.3 Potential Cost Benefits

7.3.1 If adopted the recommended modifications to the monitoring regime are adopted the following cost benefits should be delivered to SHLNG Terminal Co. Ltd. on an annual basis:

- Removal of the cost of 8 Monthly Monitoring Rounds;
- DRO Analyses: Annual reduction from ca. 220 to ca. 76;
- GRO Analyses: Annual reduction from ca. 220 to ca. 76; and
- SVOC Analyses; Annual reduction from ca. 113 to ca. 16.

References

RPS Planning and Development. 2012. Interpretative Ground Investigation Report: South Hook CHP (Western Option), South Hook LNG Terminal. JER5116R121218jg Interpretative Ground Investigation report.doc. December 2012.

RPS Planning and Development. 2010. Skim Pond Hydrogeological Assessment and Study for South Hook LNG Terminal Company Limited. Report Ref. JER4238 100726 Hydrogeological Assessment & Study Report v1. July 2010

WSP. 2012a. South Hook LNG Terminal, Updated Groundwater Trend Analysis Report, February 2012

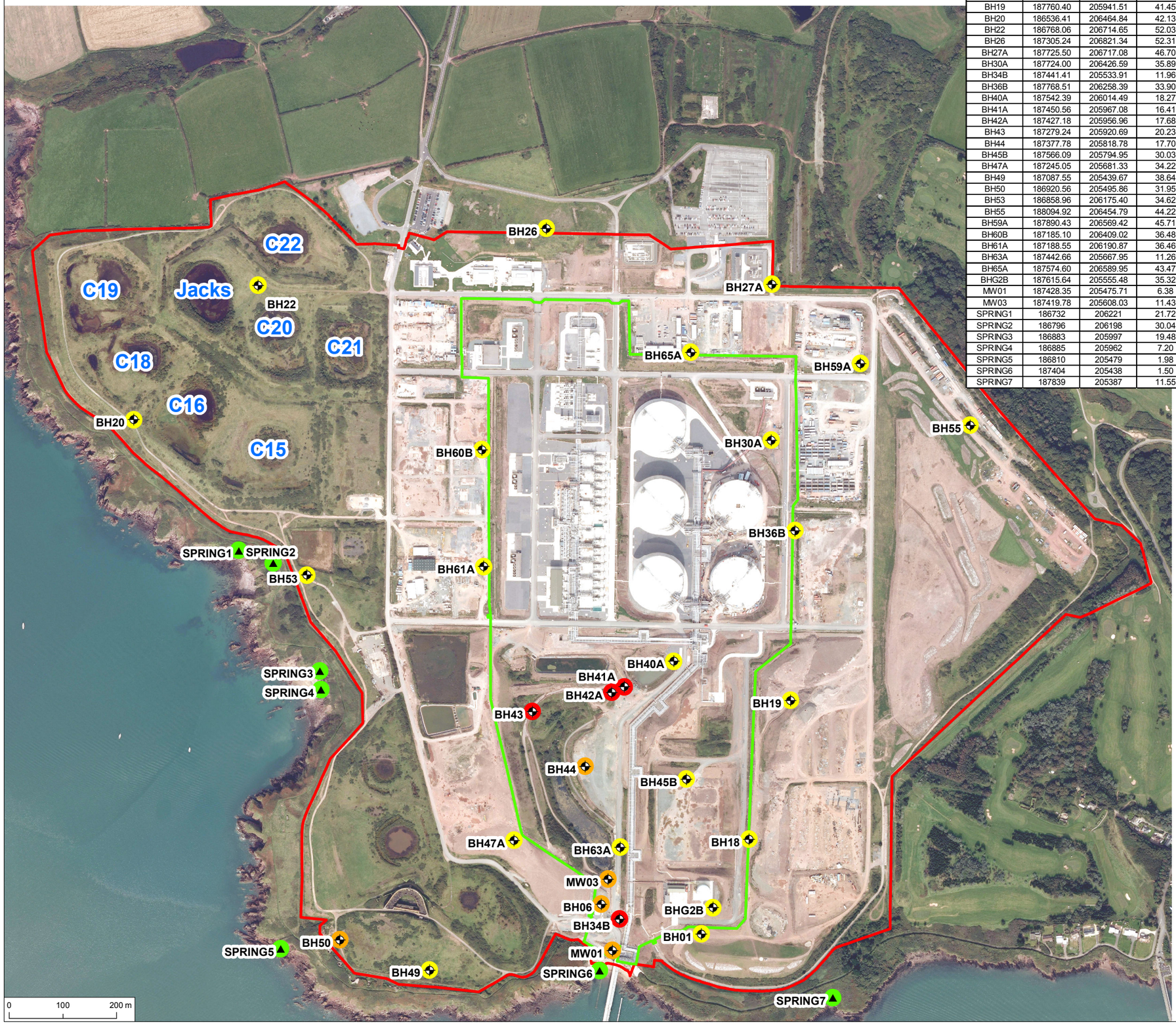
WSP. 2009. South Hook LNG Groundwater Monitoring and Trend Analysis Report, South Hook LNG, June 2009.

WSP. 2005. South Hook LNG Groundwater Monitoring and Analysis, South Hook LNG, November 2005.

Glossary

BTEX	Benzene, Toluene, Ethylbenzene and Xylene
DRO	Diesel Range Organics
EAW	Environment Agency Wales
GRO	Gasoline Range Organics (equivalent to PRO)
LNG	Liquid Natural Gas
LOD	Limit of Detection
M AOD	metres above Ordance Datum
ME	Main Excavation
NCA	Nature Conservation Area
NRW	Natural Resources Wales
PRO	Petroleum Range Organics
RPS	RPS Planning and Development
SHLNG	South Hook LNG
SVOCs	Semi Volatile Organic Compounds

Drawings



(c) Getmapping plc.

Hole ID	Easting	Northing	Ground Level (mAOD)	Total Depth (m)	Slotted Well Screen Interval (mbGL)
BH01	187593.90	205506.00	N/A	N/A	N/A
BH06	187407.39	205561.64	12.34	14.00	10.00 - 14.00
BH18	187682.98	205682.58	45.82	20.00	3.00 - 20.00
BH19	187760.40	205941.51	41.45	20.00	3.00 - 20.00
BH20	186536.41	206464.84	42.13	16.00	4.00 - 13.00
BH22	186768.06	206714.65	52.03	18.75	3.00 - 15.00
BH26	187305.24	206821.34	52.31	18.00	3.00 - 15.00
BH27A	187725.50	206717.08	46.70	15.00	9.40 - 15.00
BH30A	187724.00	206426.59	35.89	30.00	10.00 - 30.00
BH34B	187441.41	205533.91	11.96	12.00	N/A
BH36B	187768.51	206258.39	33.90	28.00	N/A
BH40A	187542.39	206014.49	18.27	18.00	6.00 - 18.00
BH41A	187450.56	205967.08	16.41	17.00	10.00 - 17.00
BH42A	187427.18	205956.96	17.68	5.75	N/A
BH43	187279.24	205920.69	20.23	15.00	3.00 - 12.00
BH44	187377.78	205818.78	17.70	28.00	3.00 - 27.00
BH45B	187566.09	205794.95	30.03	30.00	N/A
BH47A	187245.05	205681.33	34.22	43.00	10.00 - 43.00
BH49	187087.55	205439.67	38.64	30.50	12.50 - 27.50
BH50	186920.56	205495.86	31.95	20.00	6.40 - 18.40
BH53	186858.96	206175.40	34.62	24.50	3.00 - 12.00
BH55	188094.92	206454.79	44.22	15.00	3.00 - 12.00
BH59A	187890.43	206569.42	45.71	18.50	5.50 - 18.50
BH60B	187185.10	206409.02	36.48	25.00	N/A
BH61A	187188.55	206190.87	36.46	13.00	3.00 - 13.00
BH63A	187442.66	205667.95	11.26	17.00	5.00 - 17.00
BH65A	187574.60	206589.95	43.47	33.00	25.00 - 33.00
BHG2B	187615.64	205555.48	35.32	28.00	N/A
MW01	187428.35	205475.71	6.38	8.50	6.00 - 8.00
MW03	187419.78	205608.03	11.43	16.00	13.00 - 16.00
SPRING1	186732	206221	21.72		
SPRING2	186796	206198	30.04		
SPRING3	186883	205997	19.48		
SPRING4	186885	205962	7.20		
SPRING5	186810	205479	1.98		
SPRING6	187404	205438	1.50		
SPRING7	187839	205387	11.55		

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Legend

Site Boundary

Green Fence Line

Ongoing Site Monitoring Locations

Monitoring Well Location

Spring Location

Monitoring Frequency

Monthly - DRO, PRO, SVOCs

Quarterly - DRO, PRO

Biannually - DRO, PRO

Annually - DRO, PRO

Rev	Description	Date	Initial	Checked
B	Basemap changed to Aerial Photo	AUG 13	RJ	AG
A	MW01 & MW 03 Added, Table Updated	OCT 12	RJ	HM

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Project: MONITORING PROGRAMME

Title: GROUNDWATER & SURFACE WATER MONITORING PLAN

Status	Drawn By	PM/Checked By
PRELIMINARY	RJ	AG
Job Ref	**Scale @ A3**	**Date Created**
JER5575U	1:7,500	AUG 12

Drawing Number: **JER5575U-001**

Rev: **B**

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Hole ID	Easting	Northing	Ground Level (mAOD)	Total Depth (m)	Slotted Well Screen Interval (mbGL)
BH01	187593.90	205506.00	N/A	N/A	N/A
BH06	187407.39	205561.64	12.34	14.00	10.00 - 14.00
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SPRING7	187839	205387	11.55		

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Legend

- Site Boundary
- Green Fence Line
- Groundwater Divide
- Schematic Groundwater Flow Direction

Ongoing Site Monitoring Locations

- Monitoring Well Location
- Spring Location
- 1. Main Excavation Boundary
- 2. South of the Main Excavation Area
- 3. Valley Area Upstream of Skim Pond
- 4. Valley Area Downstream of Skim Pond
- 5. Process Area
- 6. Nature Conservation Area (NCA)
- 7. High Ground to the West of Skim Pond
- 8. Northern Site Boundary

Rev	Description	Date	Initial	Checked
A	Basemap changed to Aerial Photo	AUG 13	RJ	AG

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Project: MONITORING PROGRAMME

Title: ROUTINE GROUNDWATER MONITORING: BOREHOLE GROUPS

Status	Drawn By	PM/Checked By
PRELIMINARY	RJ	AG
Job Ref	**Scale @ A3**	**Date Created**
JER5575U	1:7,500	MAY 13

Drawing Number: **JER5575U-003** Rev: **A**

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N

Diesel Range Organics (DRO)



Gasoline Range Organics (GRO)

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Legend

- Site Boundary
- Green Fence Line

Monitoring Well Trend Analysis

- Decreasing
- No Detectable Contamination
- No Trend of Concern
- Possible Increase

Rev	Description	Date	Initial	Checked

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Title: MONITORING WELL TREND ANALYSIS: DRO & GRO

Status	Drawn By	PM/Checked By
PRELIMINARY	RJ	AG
Job Ref	**Scale @ A3**	**Date Created**
JER5575U	1:12,000	MAY 13

Drawing Number: **JER5575U-005** Rev: **-**

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Appendices

Appendix 1

Proposal for Groundwater Monitoring Review (RPS, 2013)

Our Ref: JER5575UL130304AG-GWMR
Your Ref:

E-mail: greenad@rpsgroup.com
Direct Dial: 01454 205 839
Date: 4th March 2013

Elvan Akkaya
South Hook LNG Terminal Company Ltd
Dale Road
Herbrandston
Milford Haven
Pembrokeshire
SA73 3SL

Dear Elvan

RE: Groundwater Monitoring Review

Introduction

Since October 2012 RPS Planning and Development (RPS) have undertaken the routine monitoring required on the South Hook LNG (SHLNG) terminal site as part of Framework Contract SH0068. The groundwater monitoring delivered by RPS to date is consistent with SHLNG's internal written procedures for monitoring (SHLNG Report Ref. ERL-12.04-05) and, through a process of hand-over shadowing, the detailed on-site methodology employed by previous incumbent consultants WSP.

Although there is no direct regulatory driver for the routine monitoring currently undertaken on the site, the monitoring dataset collected to date is crucial with respect to the defining baseline groundwater quality on the site and any changes therein should they occur. This knowledge is of particular important to SHLNG with respect to long-term lease issues associated with the operation of the terminal site and other developments thereon.

RPS have now completed five monthly monitoring rounds and have been instructed to undertaken a comprehensive annual monitoring review of the 2012 dataset. As recommended within the original handover documentation (RPS Report Ref. JER5575UR280803EDSHGWMonitoringHandoverPlan-Rev1_FINAL) RPS is now able to evaluate the monitoring historically undertaken on the site and to make recommendations regarding ongoing groundwater monitoring with the following specific objectives:

- Confirmation that the pre-handover sampling methodologies are the most appropriate for the overall objectives of the groundwater monitoring undertaken and the borehole / hydrogeological conditions observed at each location;
- Identify possible improvements to the sampling methodology and frequencies that will provide:
    - More representative samples for analysis hence improved conceptual understanding of groundwater quality on the site;
    - A sampling approach that delivers cost savings over the 5 year duration of the framework contract, whilst meeting all SHLNG H&S site constraints;
    - Sampling approaches and methodologies that ensure SHLNG represent best practice, not incurring excessive cost, that meet their own (& RPS) environmental protection goals.
- Determine the need for any modification to existing QA / QC protocols in order to provide a more robust and defensible dataset; and
- The data requirements for any future developments upon the site.

Scope of Works

To deliver the stated objectives of the groundwater monitoring review it is necessary to place the ongoing monitoring works within the context of the historical monitoring undertaken on the site. To complete the review the following tasks shall be therefore be undertaken:

- Review of historical contamination and remediation works on the site;
- Review and appraisal of historical groundwater monitoring dataset;
- Review and update of the CHM including historical groundwater quality;
- Review and appraisal of the monitoring network in terms of network distribution and appropriateness of locations in the context of their construction, time-series contamination status and hydrogeological setting;
- Review of regulatory and legislative drivers for the monitoring works and future changes thereof;
- Review of sampling approach and available approaches (including water management);
- Review of analyses and associated QA/Q;

Delivery of these stated tasks will be aided by the experience gained in the first five monthly monitoring rounds and the annual review of the 2012 dataset. However, the following additional tasks must also be undertaken:

- Baseline review site contamination and monitoring network design;
- A review and presentation of the complete historical dataset for all monitoring locations;
- Development of a Conceptual Hydrogeological Model (CHM) that includes a summary of site geological setting and an evaluation of hydrogeology in terms of groundwater levels, groundwater flow and flow directions on the site;
- Review of monitoring installation design, setting and contamination status;
- Liaison with key suppliers to determine effective sampling strategies that meet national and international best practice;
- Liaison with key SHLNG personnel regarding feasibility of various sampling and water management strategies for the site including any appropriate rationalisation of the current monitoring programme.

In line with the request of SHLNG it is proposed that a presentation shall be produced that summarises the CHM and analysis of the complete groundwater quality dataset. It is proposed that this presentation includes the recommendations that result from the groundwater monitoring review outlined above. Consistent with historical works undertaken on behalf of SHLNG it is proposed that the presentation shall be provided in Microsoft PowerPoint format.

Appendix 2

Geological Logs

Appendix C - Monitoring Well Logs

Appendix C1 – Phase 1

C1 – WSPR interpolated drilling logs

Appendix C2 – Phase 2

C2 – WSPR interpolated drilling logs

WSP Management Services Ltd

WSP

Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 27**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	09-03-03 09-03-03	46.110	E 187692.000 N 206698.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
				45.61	(0.50) 0.50	MADE GROUND comprising of course road gravel fill			
			▼1		(3.20)	Firm brown CLAY with occasional fine-medium gravel			
				42.41	3.70				
					(7.30)	Bands of loose medium-coarse yellow brown SAND becoming more sandy with depth			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						
		1.75									

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

WSP Management Services Ltd

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Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 27**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	09-03-03 09-03-03	46.110	E 187692.000 N 206698.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
				35.11	11.00	Bands of loose medium-coarse yellow brown SAND becoming more sandy with depth *(continued)*			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

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Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 27a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-01-05 08-01-05	46.820	E 187724.440 N 206716.440	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(1.20)	Red clay and mudstone FILL			
				45.62	1.20	Sandy CLAY			
					(9.40)				
			1						

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		10.00			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 27a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-01-05 08-01-05	46.820	E 187724.440 N 206716.440	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Sandy CLAY *(continued)*			
				36.22	10.60				
						Brown and grey SILTSTONE			
					(4.40)				
				31.82	15.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 30**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	09-04-03 09-04-03	36.740	E 187782.000 N 206433.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
				36.54	0.20	TOPSOIL			
					(0.90)	MADE GROUND comprising of brown sandy coarse gravel fill. Volitiles			
				35.64	1.10				
			1			Brown red MUDSTONE becoming siltier with depth			
					(13.90)				

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		2.00			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 30**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	09-04-03 09-04-03	36.740	E 187782.000 N 206433.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Brown red MUDSTONE becoming siltier with depth *(continued)*			
				21.74	15.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

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Telephone:
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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 30a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	28-07-05 29-07-05	35.930	E 187722.490 N 206425.330	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(6.20)	Red CLAY			
				29.73	6.20				
					(4.50)	Red and grey MUDSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 30a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	28-07-05 29-07-05	35.930	E 187722.490 N 206425.330	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red and grey MUDSTONE *(continued)*			
				25.23	10.70				
						Grey and brown SILTSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 30a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	28-07-05 29-07-05	35.930	E 187722.490 N 206425.330	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		3 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(19.30)	Grey and brown SILTSTONE *(continued)*			
			1	5.93	30.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						
		25.00									

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 36**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	09-04-03 09-04-03	31.298	E 187761.000 N 206263.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
				30.80	(0.50) 0.50	MADE GROUND comprising of topsoil 0.00 - 0.05 MADEGROUND 0.05 - 2.20 SILT/CLAY occasional cobbles of mudstone			
				29.10	(1.70) 2.20	Red brown, gravelly, sandy SILT/CLAY and occasional cobbles of mudstone			
				26.30	(2.80) 5.00	Red brown MUDSTONE 2.20 - 5.00 Red brown MUDSTONE			
				24.80	(1.50) 6.50	Light grey SANDSTONE 5.00 - 6.50 Light grey SANDSTONE			
			▼1			Red brown MUDSTONE with bands of sandstone 6.50 - 15.00 Red brown MUDSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		7.75			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 36**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	09-04-03 09-04-03	31.298	E 187761.000 N 206263.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(8.50)	Red brown MUDSTONE with bands of sandstone *(continued)*			
				16.30	15.00				

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 36a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-01-05 08-02-05	34.060	E 187767.400 N 206259.660	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(3.60)	Red CLAY 0.00 - 3.60 Red CLAY			
				30.46	3.60				
				29.96	(0.50) 4.10	Red MUDSTONE 3.60 - 4.10 Red MUDSTONE			
					(8.10)	Brown SANDSTONE 4.10 - 12.20 Brown SANDSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 36a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-01-05 08-02-05	34.060	E 187767.400 N 206259.660	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Brown SANDSTONE *(continued)*			
				21.86	12.20				
						Grey SANDSTONE 12.20 - 14.00 Grey SANDSTONE			
					(1.90)				
				19.96	14.10	14.00 - 24.00 Red SILTSTONE			
						Red SILTSTONE			
			1		(9.90)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						
		19.00									

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 36a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-01-05 08-02-05	34.060	E 187767.400 N 206259.660	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		3 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red SILTSTONE *(continued)*			
				10.06	24.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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Telephone:
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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 41**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	25-09-03 26-09-03	18.075	E 187459.000 N 205952.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
				18.06	0.02	TOPSOIL			
						MADE GROUND comprising of concrete and red/brown slightly gravelly, sandy silt/clay. Hydrocarbon odour from 6m.			
					(7.48)				
			1						
				10.58	7.50				
						Strong red brown SILTSTONE including sand and gravel			
					(3.00)				

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		5.25			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

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Telephone:
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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 41**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	25-09-03 26-09-03	18.075	E 187459.000 N 205952.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
				7.58	10.50	Strong red brown SILTSTONE including sand and gravel *(continued)*			
					(4.50)	Strong red brown fine SANDSTONE, frequent fractures			
				3.08	15.00				

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

WSP Management Services Ltd

WSP

Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 41a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	26-07-05 27-07-05	16.520	E 187449.170 N 205966.500	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(1.10)	Red clay FILL			
				15.42	1.10				
					(3.10)	Dark CLAY with hydrocarbon volatiles			
				12.32	4.20				
					(2.60)	Red clay and MUDSTONE			
				9.72	6.80				
						Grey and brown SILTSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 41a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	26-07-05 27-07-05	16.520	E 187449.170 N 205966.500	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Grey and brown SILTSTONE *(continued)*			
					(10.20)				
				-0.48	17.00				

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

WSP Management Services Ltd

WSP

Telephone:
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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 42**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	25-09-03 26-09-03	17.683	E 187395.000 N 205940.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
				17.58	0.10	TOPSOIL MADE GROUND comprising of layers of clay and gravel ranging between red and black in colour. Oily sheen and staining was also apparent.			
			1		(8.90)				
				8.68	9.00				
						Red brown fine SANDSTONE . Notable fractures			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		5.50			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 42**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	25-09-03 26-09-03	17.683	E 187395.000 N 205940.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(6.00)	Red brown fine SANDSTONE . Notable fractures *(continued)*			
				2.68	15.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 42a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	27-07-03 28-07-03	17.620	E 187404.860 N 205946.340	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(1.00)	Red CLAY			
				16.62	1.00				
					(4.20)	Dark oily CLAY			
				12.42	5.20				
					(2.60)	Red clay and MUDSTONE			
				9.82	7.80				
						Grey and red SILTSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 42a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	27-07-03 28-07-03	17.620	E 187404.860 N 205946.340	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Grey and red SILTSTONE *(continued)*			
			1		(10.20)				
				-0.38	18.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						
		13.00									

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 47**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	16-09-03 16-09-03	27.122	E 187263.000 N 205706.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
				26.92	0.20	Red brown gravelly SILT			
						Red brown MUDSTONE			
					(3.60)				
				23.32	3.80				
						Yellow green grey SANDSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 47**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	16-09-03 16-09-03	27.122	E 187263.000 N 205706.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(13.50)	Yellow green grey SANDSTONE *(continued)*			
				9.82	17.30				
						Red MUDSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		11.75			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 47**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	16-09-03 16-09-03	27.122	E 187263.000 N 205706.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		3 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(5.50)	Red MUDSTONE *(continued)*			
				4.32	22.80				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 47a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	26-07-05 26-07-05	34.410	E 187245.390 N 205683.200	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 5

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red grey mudstone fill			
					(8.30)				
				26.11	8.30				
						Red grey MUDSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 47a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	26-07-05 26-07-05	34.410	E 187245.390 N 205683.200	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 5

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(5.60)	Red grey MUDSTONE *(continued)*			
				20.51	13.90				
					(9.40)	Red brown SILTSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 47a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	26-07-05 26-07-05	34.410	E 187245.390 N 205683.200	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		3 of 5

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red brown SILTSTONE *(continued)*			
				11.11	23.30				
						Yellow brown clayey fine SAND			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 47a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	26-07-05 26-07-05	34.410	E 187245.390 N 205683.200	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		4 of 5

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(19.70)	Yellow brown clayey fine SAND *(continued)*			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						
		38.00									

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 47a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	26-07-05 26-07-05	34.410	E 187245.390 N 205683.200	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		5 of 5

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Yellow brown clayey fine SAND *(continued)*			
				-8.59	43.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 52**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	09-08-03 09-08-03	26.841	E 187241.000 N 205781.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
				26.34	(0.50) 0.50	TOPSOIL			
			1		(5.30)	Red grey MUDSTONE			
				21.04	5.80				
					(7.00)	Red brown SILTSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						
		3.50									

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 52**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	09-08-03 09-08-03	26.841	E 187241.000 N 205781.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red brown SILTSTONE *(continued)*			
				14.04	12.80				
						Yellow brown clayey fine SAND			
					(11.95)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 52**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	09-08-03 09-08-03	26.841	E 187241.000 N 205781.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		3 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Yellow brown clayey fine SAND *(continued)*			
				2.09	24.75				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 52a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	25-07-05 26-07-05	34.830	E 187241.880 N 205755.630	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 5

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red grey mudstone. Backfill			
					(9.70)				
				25.13	9.70				
						Red grey MUDSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 52a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	25-07-05 26-07-05	34.830	E 187241.880 N 205755.630	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 5

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(6.10)	Red grey MUDSTONE *(continued)*			
				19.03	15.80				
					(6.90)	Red brown SILTSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 52a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	25-07-05 26-07-05	34.830	E 187241.880 N 205755.630	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		3 of 5

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red brown SILTSTONE *(continued)*			
				12.13	22.70				
						Yellow brown clayey fine SAND			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 52a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	25-07-05 26-07-05	34.830	E 187241.880 N 205755.630	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		4 of 5

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Yellow brown clayey fine SAND *(continued)*			
					(26.30)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 52a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	25-07-05 26-07-05	34.830	E 187241.880 N 205755.630	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		5 of 5

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
			1			Yellow brown clayey fine SAND *(continued)*			
				-14.17	49.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						
		44.00									

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 59**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	18-09-03 26-09-03	43.510	E 187879.000 N 206584.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(6.00)	Medium red brown fine SANDSTONE getting stronger with depth. Occasional yellow brown clay layers. Highly fractured.			
			1	37.51	6.00				
					(2.42)	Red brown grey SANDSTONE			
				35.09	8.42				
				34.91	8.60	Red brown very stong SILTSTONE	× × ×		
						Red brown strong fine SANDSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		4.25			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

WSP Management Services Ltd

WSP

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Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 59**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	18-09-03 26-09-03	43.510	E 187879.000 N 206584.000	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(3.00)	Red brown strong fine SANDSTONE *(continued)*			
				31.91	11.60				
						Strong red brown SILTSTONE			
					(3.00)				
				28.91	14.60				
						Strong fine red SANDSTONE			
				28.41	(0.50) 15.10				

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By RPS

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 59a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	29-07-05 29-07-05	45.750	E 187889.580 N 206568.580	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(2.80)	Red clay and MUDSTONE			
				42.95	2.80				
					(8.80)	Red MUDSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 59a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	29-07-05 29-07-05	45.750	E 187889.580 N 206568.580	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red MUDSTONE *(continued)*			
				34.15	11.60				
						Grey and brown SILTSTONE			
					(6.90)				
				27.25	18.50				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By WSPR

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Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 60a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-02-05 08-02-05	35.040	E 187190.030 N 206408.220	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(4.60)	Red clay and MUDSTONE			
				30.44	4.60				
					(10.20)	Red MUDSTONE			

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 60a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-02-05 08-02-05	35.040	E 187190.030 N 206408.220	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red MUDSTONE *(continued)*			
				20.24	14.80				
						Grey and red SILTSTONE			
			1		(10.20)				

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		20.00			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 60a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-02-05 08-02-05	35.040	E 187190.030 N 206408.220	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		3 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Grey and red SILTSTONE *(continued)*			
				10.04	25.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 61a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-02-05 08-03-05	36.330	E 187187.630 N 206189.930	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(1.10)	Red CLAY			
				35.23	1.10				
						Grey and brown SILTSTONE			
					(11.90)				
			▼1						

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		8.00			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 61a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-02-05 08-03-05	36.330	E 187187.630 N 206189.930	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Grey and brown SILTSTONE *(continued)*			
				23.33	13.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 65A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	44.01	E 5,559.4 N 4,897.4	
Contractor				Sheet
Apex Drilling Services				1 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(2.00)	Red SILTSTONE			
				42.01	2.00				
						Red silty MUDSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 65A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	44.01	E 5,559.4 N 4,897.4	
Contractor				Sheet
Apex Drilling Services				2 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(22.30)	Red silty MUDSTONE *(continued)*			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 65A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	44.01	E 5,559.4 N 4,897.4	
Contractor				Sheet
Apex Drilling Services				3 of 4

SAMPLES & TESTS			Water	STRATA					
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Geology	Instrument/ Backfill
						Red silty MUDSTONE *(continued)*			
				19.71	24.30				
						Light brown silty SANDSTONE			
					(3.30)				
				16.41	27.60				
			▼			Red SILTSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 65A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	44.01	E 5,559.4 N 4,897.4	
Contractor				Sheet
Apex Drilling Services				4 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(5.40)	Red SILTSTONE *(continued)*			
				11.01	33.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 64A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	30.26	E 5,422.1 N 4,706.1	
Contractor				Sheet
Apex Drilling Services				1 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.80)	Made ground comprising of red silty MUDSTONE			
				29.46	0.80	Red silty MUDSTONE			
					(11.40)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 64A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	30.26	E 5,422.1 N 4,706.1	
Contractor				Sheet
Apex Drilling Services				2 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red silty MUDSTONE *(continued)*			
				18.06	12.20				
						Red SILTSTONE			
					(14.80)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 64A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	30.26	E 5,422.1 N 4,706.1	
Contractor				Sheet
Apex Drilling Services				3 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red SILTSTONE *(continued)*			
				3.26	27.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 63A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	08-03-06 09-03-06	11.49	E 5,441.1 N 3,974.0	
Contractor				Sheet
Apex Drilling Services				1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(1.00)	Made ground comprising of clayey MUDSTONE			
				10.49	1.00	Red silty MUDSTONE			
					(16.00)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 63A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	08-03-06 09-03-06	11.49	E 5,441.1 N 3,974.0	
Contractor				Sheet
Apex Drilling Services				2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
			1			Red silty MUDSTONE *(continued)*			
				-5.52	17.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

AGS3 UK BH SHOOKLNGUPDATE.GPJ AGS3_ALL.GDT 19/7/06

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 62A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	15-03-06 15-03-06	30.02	E 5,422.0 N 4,557.5	
Contractor				Sheet
Apex Drilling Services				1 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(0.80)	Made ground comprising of red silty MUDSTONE			
				29.22	0.80	Red silty MUDSTONE			
					(11.20)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 62A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	15-03-06 15-03-06	30.02	E 5,422.0 N 4,557.5	
Contractor				Sheet
Apex Drilling Services				2 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red silty MUDSTONE *(continued)*			
				18.02	12.00				
						Red / grey interbeded SILTSTONE			
					(15.00)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 62A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	15-03-06 15-03-06	30.02	E 5,422.0 N 4,557.5	
Contractor				Sheet
Apex Drilling Services				3 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
			1			Red / grey interbeded SILTSTONE *(continued)*			
				3.02	27.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 47A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	10-03-06 10-03-06	34.72	E 5,243.3 N 3,984.6	
Contractor				Sheet
Apex Drilling Services				1 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(6.80)	Made ground comprising of silty MUDSTONE			
				27.92	6.80				
						Red silty MUDSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 47A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	10-03-06 10-03-06	34.72	E 5,243.3 N 3,984.6	
Contractor				Sheet
Apex Drilling Services				2 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red silty MUDSTONE *(continued)*			
					(15.80)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 47A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	10-03-06 10-03-06	34.72	E 5,243.3 N 3,984.6	
Contractor				Sheet
Apex Drilling Services				3 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red silty MUDSTONE *(continued)*			
				12.12	22.60				
						Light brown silty SANDSTONE			
					(10.80)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 47A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	10-03-06 10-03-06	34.72	E 5,243.3 N 3,984.6	
Contractor				Sheet
Apex Drilling Services				4 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Light brown silty SANDSTONE *(continued)*			
				1.32	33.40				
			1			Red silty MUDSTONE			
					(6.60)				
				-5.28	40.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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WSP Management Services Ltd

Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 45A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	09-03-06 09-03-06	30.64	E 5,571.1 N 4,101.3	
Contractor				Sheet
Apex Drilling Services				1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Made ground comprising of soft CLAY			
					(9.60)				
				21.04	9.60				
						Red silty MUDSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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WSP Management Services Ltd

Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 45A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	09-03-06 09-03-06	30.64	E 5,571.1 N 4,101.3	
Contractor				Sheet
Apex Drilling Services				2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red silty MUDSTONE *(continued)*			
					(10.40)				
				10.64	20.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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WSP Management Services Ltd

Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				BH 40A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	08-03-06 08-03-06	18.75	E 5,535.4 N 4,321.7	
Contractor				Sheet
Apex Drilling Services				1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(4.50)	Red CLAY			
				14.25	4.50				
					(1.90)	Red silty MUDSTONE			
				12.35	6.40				
					(6.00)	Brown silty SANDSTONE			

Boring Progress and Water Observations						Chiselling			Water Added	
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To

GENERAL REMARKS

Hydrocarbon odour upon drilling.

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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WSP Management Services Ltd

Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 40A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	08-03-06 08-03-06	18.75	E 5,535.4 N 4,321.7	
Contractor				Sheet
Apex Drilling Services				2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Brown silty SANDSTONE *(continued)*			
				6.35	12.40				
			▼1			Red silty MUDSTONE			
					(5.60)				
				0.75	18.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	Hydrocarbon odour upon drilling.

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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WSP Management Services Ltd

Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH G2A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	14-03-06 14-03-06	35.43	E 5,594.5 N 3,861.7	
Contractor				Sheet
Apex Drilling Services				1 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(1.90)	Red silty MUDSTONE			
				33.53	1.90				
					(2.90)	Grey SILTSTONE			
				30.63	4.80				
					(3.10)	Red silty MUDSTONE			
				27.53	7.90				
						Red SILTSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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WSP Management Services Ltd

Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH G2A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	14-03-06 14-03-06	35.43	E 5,594.5 N 3,861.7	
Contractor				Sheet
Apex Drilling Services				2 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red SILTSTONE *(continued)*			
					(20.00)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

AGS3 UK BH SHOOKLNGUPDATE.GPJ AGS3_ALL.GDT 19/7/06

WSP Management Services Ltd

Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH G2A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	14-03-06 14-03-06	35.43	E 5,594.5 N 3,861.7	
Contractor				Sheet
Apex Drilling Services				3 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red SILTSTONE *(continued)*			
			1						
				7.53	27.90				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

AGS3 UK BH SHOOKLNGUPDATE.GPJ AGS3_ALL.GDT 19/7/06

RPS Planning, Transport and Environment

Rotary Borehole Log

Borehole No. BH18

Site Name: Milford Haven

Client Name: Qatargas II

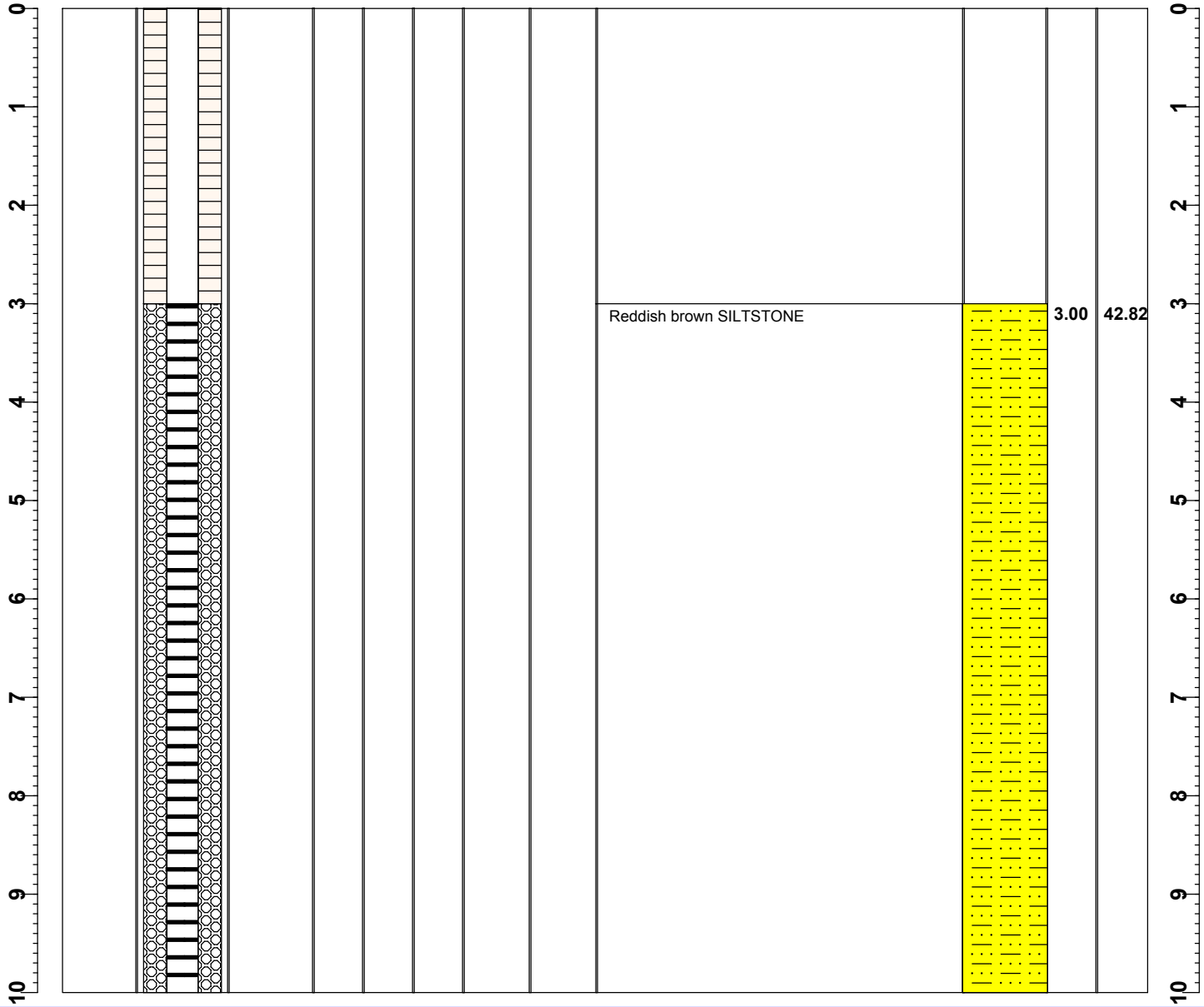
Drilling Method: Berretta 141

Borehole Diameter: 200mm

Contractor Apex Drilling

Core Diameter: N/A

Depth	Sample Reference	Installation	Core recovery: Core Run (From/To)	Core recovery: TCR	Core recovery: SCR	Core recovery: RQD	Fracture Index (min/avg/max)	In Situ Tests	Description of Strata	Lithology	Level (mbGL)	Level (mAOD)	Depth
									Reddish brown SILTSTONE		3.00	42.82	



Groundwater Strikes - Depth (mbGL)

Strike Number	Strike Depth	Rest Level	Sample No.	Notes

Eastings: 187682.98

Northings: 205682.58

Ground Level (mAOD): 45.82

Comments: 1. Continued from cable percussive rig from 3.0mbGL

2. Open hole from 3-20.00mbGL

Start Date: 24/10/02

End Date: 24/10/02

Logged By: GF

RPS Planning, Transport and Environment

Rotary Borehole Log

Borehole No. BH18

Site Name: Milford Haven

Client Name: Qatargas II

Drilling Method: Berretta 141

Borehole Diameter: 200mm

Contractor Apex Drilling

Core Diameter: N/A

Depth	Sample Reference	Installation	Core recovery: Core Run (From/To)	Core recovery: TCR	Core recovery: SCR	Core recovery: RQD	Fracture Index (min/avg/max)	In Situ Tests	Description of Strata	Lithology	Level (mbGL)	Level (mAOD)	Depth
10									Reddish brown SILTSTONE		10.00	35.82	10
11													11
12													12
13													13
14													14
15													15
16													16
17													17
18													18
19													19
20													20

Groundwater Strikes - Depth (mbGL)

Strike Number	Strike Depth	Rest Level	Sample No.	Notes

Eastings: 187682.98

Northings: 205682.58

Ground Level (mAOD): 45.82

Comments: 1. Continued from cable percussive rig from 3.1mbGL

2. Open hole from 3-20.00mbGL

Start Date: 24/10/02

End Date: 24/10/02

Logged By: GF

Page No. 2 of 2

RPS Planning, Transport and Environment

Rotary Borehole Log

Borehole No. BH19

Site Name: Milford Haven

Client Name: Qatargas II

Drilling Method: Berretta 141

Contractor Apex Drilling

Borehole Diameter: 200mm

Core Diameter: 76mm

Depth	Sample Reference	Installation	Core recovery: Core Run (From/To)	Core recovery: TCR	Core recovery: SCR	Core recovery: RQD	Fracture Index (min/avg/max)	In Situ Tests	Description of Strata	Lithology	Level (mbGL)	Level (mAOD)	Depth
0									SILTSTONE (Drillers description)				0
1									Hard reddish brown highly fractured silty clayey MUDSTONE. Clay becomes less with depth		1.20	40.25	1
2													2
3													3
4													4
5													5
6													6
7													7
8													8
9													9
10													10

Groundwater Strikes - Depth (mbGL)

Strike Number	Strike Depth	Rest Level	Sample No.	Notes

Eastings: 187760.40

Northings: 205941.51

Ground Level (mAOD): 41.45

Comments:

1. Continued from S&A rig
2. Open hole to 20.00mbGL
3. Groundwater encountered, although depth is unknown

Start Date: 23/10/02

End Date: 24/10/02

Logged By: GF

RPS Planning, Transport and Environment

Rotary Borehole Log

Borehole No. BH19

Site Name: Milford Haven

Client Name: Qatargas II

Drilling Method: Berretta 141

Contractor Apex Drilling

Borehole Diameter: 200mm

Core Diameter: 76mm

Depth	Sample Reference	Installation	Core recovery: Core Run (From/To)	Core recovery: TCR	Core recovery: SCR	Core recovery: RQD	Fracture Index (min/avg/max)	In Situ Tests	Description of Strata	Lithology	Level (mbGL)	Level (mAOD)	Depth
10									Hard reddish brown highly fractured silty clayey MUDSTONE. Clay becomes less with depth		10.00	31.45	10
11													11
12													12
13													13
14													14
15													15
16													16
17													17
18													18
19													19
20													20

Groundwater Strikes - Depth (mbGL)

Strike Number	Strike Depth	Rest Level	Sample No.	Notes

Eastings: 187760.40

Northings: 205941.51

Ground Level (mAOD): 41.45

Comments:
1. Continued from S&A rig
2. Open hole to 20.00mbGL
3. Groundwater encountered, although depth is unknown

Start Date: 23/10/02

End Date: 24/10/02

Logged By: GF

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH20** Sheet 1 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	186536E - 206465N E 206464.84 N	42.129 m OD	28/08/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
		1.00	1		41.33	0.80		Weathered brown CLAY and sandstone GRAVEL. Gravel is fine-coarse and subrounded-angular. (CLAY/GRAVEL)
								Red brown mudstone and sandstone GRAVEL. Gravel is fine-coarse, subrounded-angular becoming damp at 10.9m (GRAVEL)

Type Results

Continued next sheet

42.00 41.50 41.00 40.50 40.00 39.50 39.00 38.50 38.00 37.50 37.00 36.50 36.00 35.50 35.00 34.50 34.00 33.50 33.00 32.50

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
12.30	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH20** Sheet 2 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	42.129 m OD	28/08/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
	▼							Red brown mudstone and sandstone GRAVEL. Gravel is fine-coarse, subrounded-angular becoming damp at 10.9m (GRAVEL)
					26.13	16.00		End of Borehole at 16.00 m

32.00 31.50 31.00 30.50 30.00 29.50 29.00 28.50 28.00 27.50 27.00 26.50 26.00 25.50 25.00 24.50 24.00 23.50 23.00 22.50

Type Results

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
12.30	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH22** Sheet 1 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	186768E - 206715N E 206714.65 N	52.034 m OD	28/08/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
					51.99	0.04		MADEGROUND: Comprising yellow sandstone fill with occasional red/brown sand and gravel. Gravel is fine-coarse, subrounded-subangular-angular. (MADEGROUND)
		2.00	D					Red brown MUDSTONE with medium-fine sand. (MUDSTONE)
					49.23	2.80		Weak (loose) light brown SANDSTONE with occasional fine, subangular-angular gravels. (SANDSTONE)
					47.93	4.10		Hard (dense) fine light brown SANDSTONE with occasional fine, subangular to angular gravels. (SANDSTONE)
					46.73	5.30		Red brown MUDSTONE with silt/sand lenses becoming damp at 6.5m. (MUDSTONE)
			Type	Results				Continued next sheet

52.00 51.50 51.00 50.50 50.00 49.50 49.00 48.50 48.00 47.50 47.00 46.50 46.00 45.50 45.00 44.50 44.00 43.50 43.00 42.50

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				14.50	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH22**
Sheet 2 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	52.034 m OD	28/08/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
	▼							Red brown MUDSTONE with silt/sand lenses becoming damp at 6.5m. (MUDSTONE)
					33.28	18.75		End of Borehole at 18.75 m

Type	Results

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
14.50	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH26**

Sheet 1 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	187305E - 206821N E 206821.34 N	52.313 m OD	03/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
					52.01	0.30		Brown sandy clay TOPSOIL, with coarse GRAVEL. Gravel is angular-subangular with some fine-medium gravel and occasional cobbles. (TOPSOIL/GRAVEL)
		1.00	D		51.21	1.10		Yellow weathered sandstone GRAVEL, medium-coarse, subangular-angular. (GRAVEL)
								Red brown MUDSTONE becoming more dense and with increasing silt with depth (MUDSTONE)
					45.11	7.20		Brown/grey silty weak SANDSTONE. (SANDSTONE)
					44.31	8.00		Red brown silty MUDSTONE (MUDSTONE)
					43.61	8.70		Brown grey silty strong SANDSTONE, with bands of silty mudstone. (SANDSTONE/MUDSTONE)

Type Results

Continued next sheet

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
14.10	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH26** Sheet 2 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	52.313 m OD	03/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
	▼							Brown grey silty strong SANDSTONE, with bands of silty mudstone. (SANDSTONE/MUDSTONE)
					34.31	18.00		End of Borehole at 18.00 m

Type	Results

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
14.10	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH27**

Sheet 1 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	187692E - 206698N E 206697.53 N	46.110 m OD	03/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
					45.61	0.50		MADEGROUND: Comprising coarse road gravel fill, heterogeneous (MADEGROUND)
	▼	1.50	D					Firm brown CLAY with occasional fine-medium gravel, subrounded-subangular. Wet at 3.7m. (CLAY)
					42.41	3.70		Bands of loose medium-coarse yellow brown SAND becoming more sandy with depth (SAND)
			Type	Results				

Continued next sheet

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				2.00	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

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BOREHOLE LOG

Borehole No. **BH27**
Sheet 2 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	46.110 m OD	03/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Bands of loose medium-coarse yellow brown SAND becoming more sandy with depth
								(SAND)
					35.11	11.00		End of Borehole at 11.00 m

Type	Results

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
2.00	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

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Borehole No. **BH30**

Sheet 1 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	187782E - 206433N E 206432.57 N	36.746 m OD	04/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
					36.55	0.20		(TOPSOIL)
								MADEGROUND: Comprising brown sandy coarse gravel fill. Gravel is subrounded-angular. Olfactory evidence of volatiles
								(MADEGROUND)
	▼	1.10	D		35.65	1.10		Brown red MUDSTONE becoming siltier with depth
								(MUDSTONE)

Continued next sheet

Type | Results

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				2.00	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

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Borehole No. **BH30** Sheet 2 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	36.746 m OD	04/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Brown red MUDSTONE becoming siltier with depth (MUDSTONE)
					21.75	15.00		End of Borehole at 15.00 m

26.50 26.00 25.50 25.00 24.50 24.00 23.50 23.00 22.50 22.00 21.50 21.00 20.50 20.00 19.50 19.00 18.50 18.00 17.50 17.00

Type Results

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				2.00	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH36**

Sheet 1 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	187761E - 206263N E 206262.88 N	31.928 m OD	04/09/2003	GF

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
					31.88	0.05		MADEGROUND:Comprising TOPSOIL (MADEGROUND)
		0.90	D					Red brown gravelly, sandy SILT/CLAY and occasional cobbles of mudstone (SILT/CLAY)
					29.73	2.20		Red brown MUDSTONE (MUDSTONE)
					26.93	5.00		Light grey SANDSTONE (SANDSTONE)
	▼				25.43	6.50		Red brown MUDSTONE with bands of sandstone (MUDSTONE/SANDSTONE)
			Type	Results				

31.50 31.00 30.50 30.00 29.50 29.00 28.50 28.00 27.50 27.00 26.50 26.00 25.50 25.00 24.50 24.00 23.50 23.00 22.50 22.00

Continued next sheet

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				7.20	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH36**
Sheet 2 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	31.928 m OD	04/09/2003	GF

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Red brown MUDSTONE with bands of sandstone (MUDSTONE/SANDSTONE)
					16.93	15.00		End of Borehole at 15.00 m

21.50 21.00 20.50 20.00 19.50 19.00 18.50 18.00 17.50 17.00 16.50 16.00 15.50 15.00 14.50 14.00 13.50 13.00 12.50 12.00

Type Results

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
7.20	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH40** Sheet 1 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	187549E - 206079N E 206078.65 N	20.447 m OD	04/09/2003	PK

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
		0.70	D					Soft red brown gravelly CLAY. Gravel comprises subangular red/brown mudstone (GRAVEL/CLAY)
					19.25	1.20		Loose GRAVEL. Gravel comprising angular-subrounded mudstone and fine sandstone clasts (GRAVEL)
					18.65	1.80		NO RECOVERY
		5.00	D		15.95	4.50		Soft red brown CLAY. (CLAY)
					14.95	5.50		Red brown MUDSTONE. (MUDSTONE)
					11.45	9.00		Red grey brown MUDSTONE. (MUDSTONE)

Type | Results

Continued next sheet

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				15.50	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH40** Sheet 2 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	20.447 m OD	04/09/2003	PK

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Red grey brown MUDSTONE. (MUDSTONE)
					8.45	12.00		Loose brown grey clayey GRAVEL. Gravel comprises mudstone, sandstone and siltstone (GRAVEL)
	▼				5.45	15.00		Dark brown grey medium grained SANDSTONE. (SANDSTONE)

10.00 9.50 9.00 8.50 8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50

Type Results

Continued next sheet

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				15.50	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH40** Sheet 3 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	20.447 m OD	04/09/2003	PK

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Dark brown grey medium grained SANDSTONE. (SANDSTONE)
					-1.55	22.00		End of Borehole at 22.00 m

0.00 -0.50 -1.00 -1.50 -2.00 -2.50 -3.00 -3.50 -4.00 -4.50 -5.00 -5.50 -6.00 -6.50 -7.00 -7.50 -8.00 -8.50 -9.00 -9.50

Type Results

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				15.50	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH45** Sheet 1 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	187577E - 205761N E 205761.11 N	30.775 m OD	03/09/2003	PK

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
					30.48	0.30		Soft red brown CLAY (CLAY)
		0.50	D					Loose purple brown clayey SAND with pebbles of mudstone (SAND)
		3.00	D					
					26.28	4.50		Soft red brown CLAY with some sand (CLAY)
					24.78	6.00		Loose red brown SAND and CLAY, very weathered (SAND/CLAY)
					23.78	7.00		Loose grey red brown fine SAND with clay (SAND)
			Type	Results				

Continued next sheet

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				14.00	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH45** Sheet 2 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	30.775 m OD	03/09/2003	PK

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Loose grey red brown fine SAND with clay (SAND)
					18.18	12.60		Loose red very coarse SAND. Sand grains comprise mudstone and clay (SAND)
	▼				16.08	14.70		Red brown MUDSTONE. (MUDSTONE)

Continued next sheet

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				14.00	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH45** Sheet 3 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	30.775 m OD	03/09/2003	PK

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Red brown MUDSTONE. (MUDSTONE)
					3.78	27.00		End of Borehole at 27.00 m

10.50 10.00 9.50 9.00 8.50 8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00

Type Results

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				14.00	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH47**

Sheet 1 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	187263E - 205706N E 205706.34 N	27.122 m OD	16/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
					26.92	0.20		Red brown gravelly SILT. (SILT)
								Moderately strong red brown MUDSTONE. Weathered and thinly bedded. (MUDSTONE)
					24.82	2.30		Red brown soft MUDSTONE. (MUDSTONE)
					23.32	3.80		Yellow green grey SANDSTONE. (SANDSTONE)
			Type	Results				

Continued next sheet

27.00 26.50 26.00 25.50 25.00 24.50 24.00 23.50 23.00 22.50 22.00 21.50 21.00 20.50 20.00 19.50 19.00 18.50 18.00 17.50

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				10.50	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH47**
Sheet 2 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	27.122 m OD	16/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
	▼							Yellow green grey SANDSTONE. (SANDSTONE)
					9.82	17.30		Red MUDSTONE (MUDSTONE)
			Type	Results				

Continued next sheet

17.00 16.50 16.00 15.50 15.00 14.50 14.00 13.50 13.00 12.50 12.00 11.50 11.00 10.50 10.00 9.50 9.00 8.50 8.00 7.50

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				10.50	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH47** Sheet 3 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	27.122 m OD	16/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Red MUDSTONE
								(MUDSTONE)
					4.32	22.80		End of Borehole at 22.80 m

7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00 -0.50 -1.00 -1.50 -2.00 -2.50

Type Results

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
10.50	-	-

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HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH49** Sheet 1 of 4

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	187088E - 205440N E 205439.67 N	38.638 m OD	01/09/2003	GF

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
		0.90	D		37.64	1.00		MADEGROUND: Red brown mudstone in a matrix of sandy clay (10-20%) (MADE GROUND)
		2.50	D					Light grey MUDSTONE (MUDSTONE)
					32.14	6.50		Red brown MUDSTONE and sandstone (MUDSTONE/SANDSTONE)

38.50 38.00 37.50 37.00 36.50 36.00 35.50 35.00 34.50 34.00 33.50 33.00 32.50 32.00 31.50 31.00 30.50 30.00 29.50 29.00

Continued next sheet

Type Results

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				-	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH49**

Sheet 2 of 4

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	38.638 m OD	01/09/2003	GF

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Red brown MUDSTONE and sandstone (MUDSTONE/SANDSTONE)
					26.64	12.00		Yellowish light grey SANDSTONE (SANDSTONE)
					20.14	18.50		Red brown SANDSTONE (SANDSTONE)
			Type	Results				

28.50 28.00 27.50 27.00 26.50 26.00 25.50 25.00 24.50 24.00 23.50 23.00 22.50 22.00 21.50 21.00 20.50 20.00 19.50 19.00

Continued next sheet

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
-	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

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BOREHOLE LOG

Borehole No.
BH49
Sheet 3 of 4

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	38.638 m OD	01/09/2003	GF

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Red brown SANDSTONE (SANDSTONE)

18.50
18.00
17.50
17.00
16.50
16.00
15.50
15.00
14.50
14.00
13.50
13.00
12.50
12.00
11.50
11.00
10.50
10.00
9.50
9.00

Type Results

Continued next sheet

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
-	-	-

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HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH49**

Sheet 4 of 4

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	38.638 m OD	01/09/2003	GF

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
					8.14	30.50		Red brown SANDSTONE (SANDSTONE)
								End of Borehole at 30.50 m

8.50 8.00 7.50 7.00 6.50 6.00 5.50 5.00 4.50 4.00 3.50 3.00 2.50 2.00 1.50 1.00 0.50 0.00 -0.50 -1.00

Type Results

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
-	-	-

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HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH53**
Sheet 1 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	186859E - 206175N E 206175.40 N	34.617 m OD	02/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								MADEGROUND: Comprising roadfill, coarse-medium, subangular-angular gravel. (MADEGROUND)
					33.92	0.70		
		1.00	D					Red brown weak mudstone GRAVEL. Gravel is fine-coarse, subangular-angular with occasional sand. (GRAVEL)
					32.12	2.50		Brown soft CLAY with occasional fine gravel, subangular-angular. (CLAY)
					31.12	3.50		Red brown sandy CLAY with frequent mudstone gravel, subangular -angular, medium-fine. Decreasing clay with depth. (CLAY)
					30.32	4.30		Brown red mudstone and siltstone bands (MUDSTONE/SILTSTONE)
			Type	Results				

Continued next sheet

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				20.00	-	0.00

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

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RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH53**
Sheet 2 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	34.617 m OD	02/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Brown red mudstone and siltstone bands (MUDSTONE/SILTSTONE)

Continued next sheet

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				20.00	-	0.00

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HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH53**
Sheet 3 of 3

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	34.617 m OD	02/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Brown red mudstone and siltstone bands (MUDSTONE/SILTSTONE)
					10.12	24.50		End of Borehole at 24.50 m

14.50 14.00 13.50 13.00 12.50 12.00 11.50 11.00 10.50 10.00 9.50 9.00 8.50 8.00 7.50 7.00 6.50 6.00 5.50 5.00

Type Results

Remarks:

Chiselling Details

Time Taken	Depth From (m)	Depth To (m)	Tool Used

Groundwater Notes

Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
20.00	-	0.00

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH55** Sheet 1 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	188095E - 206455N E 206454.79 N	44.219 m OD	04/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
					44.02	0.20		(TOPSOIL)
								Brown/yellow medium-coarse SANDS with occasional gravel. Gravel is subrounded-subangular
								(SAND)
		1.50	D					
					42.12	2.10		Weathered brown MUDSTONE
								(MUDSTONE)
					38.62	5.60		Brown silty MUDSTONE
								(MUDSTONE)
			Type	Results				

Continued next sheet

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				9.50	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

RPS Planning, Transport and Environment

BOREHOLE LOG

Borehole No. **BH55**
Sheet 2 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	Rotary

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	44.219 m OD	04/09/2003	J.M/W.U

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
								Brown silty MUDSTONE
								(MUDSTONE)
					29.22	15.00		End of Borehole at 15.00 m

34.00 33.50 33.00 32.50 32.00 31.50 31.00 30.50 30.00 29.50 29.00 28.50 28.00 27.50 27.00 26.50 26.00 25.50 25.00 24.50

Type Results

Remarks:

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				9.50	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH59** Sheet 1 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	C

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	187879E - 206584N E 206584.00 N	43.510 m OD	18/09/2003-26/09/2003	WU/JO/GF/RG

Well	Water Strikes	Samples & In Situ Testing: Depth (m)	Type	Results			Level (m AOD)	Depth (m)	Legend	Description Of Strata
				TCR	SCR	RQD	FI			
	▼	3.00-4.50	95	43	43					Medium red brown, finely grained strong SANDSTONE. Black staining on all fracture surfaces, possibly oxidised manganese (SANDSTONE) FROM 3.0 TO 4.5; F1: 45º, close, planar moderately smooth, open, @ 3.10, 3.34, 3.51, 3.66, 3.67, 4, 4.16, Black staining in all fractures, possible oxidised manganeseF2: 60º, medium, planar moderately smooth, open, @ 3.41, 3.66, 3.81, Black staining in all fractures, possible oxidised manganeseF3: Sub Horizontal, medium, planar moderately smooth, open, @ 3.23, 3.61, Black staining in all fractures, possible oxidised manganeseF4: Sub-vertical, medium, planar moderately smooth, open, @ 3.89-3.91, 4.29-4.43, Black staining in all fractures, possible oxidised manganese
							39.01	4.50		
		4.50-6.00	92	57	43					Strong, medium brown, fine SANDSTONE. Highly weathered and fractures from 5m, infilled with sandstone gravels and occasional yellow brown clay. Black staining- possible oxidised manganese. (SANDSTONE) FROM 4.5 TO 6.0; F1: Sub-vertical, medium, planar moderately smooth, open-open, @ 4.82-4.92, 5.44-5.64, 6-5.67, 5.68-5.82, 5.84-5.94, Sandstone gravels, gravels and occasional yellow brown clay, Weathering from >5.0, Black staining from possible oxidised manganeseF2: Sub Horizontal, close, planar stepped-moderately smooth, open, @ 5, 5.08, 5.12F3: 45º, close, planar moderately smooth, open, @ 4.8, 5.23, 5.4, 5.72, 5.85, Angular to subangular sandstone gravels
							37.51	6.00		
		6.00-7.10	91	24	0					Red brown grey finely grained strong SANDSTONE (SANDSTONE) FROM 6.0 TO 7.1; F1: 45º, close, moderately smooth-planar rough, moderately open-open, @ 6.23, 6.49, 6.91, , typically clean with occasional sandy gravel infill, Black staining F2: Sub Horizontal, close, moderately smooth-planar rough, @ 6.25, 6.34, 6.42 6.94, , Red brown sandstone gravel infill (angular to subangular, medium-coarse, with occasional clay and fine sand)F3: Sub-horizontal, , moderately planar rough, very open, @ 6.40-6.48, 6.56-6.88, , typically angular to subangular sandstoen gravel, with fine sand and rare yellow brown silty clay on facies
							36.41	7.10		
		7.10-8.60	100	45	30					
							35.09	8.42		
							34.91	8.60		Red dark brown, fine-medium grained strong SANDSTONE (SANDSTONE) FROM 7.1 TO 8.6; F1: 45º, planar smooth , moderately open, @ 7.82, 7.33, 7.55, 7.72, 7.78, 8.14, 8.38, typically clean , Black staining on faces (Mg+?)F2: Sub Horizontal, planar rough, open, @ 7.1-7.23, 7.4-7.52, 8.06, 8.49, Coarse sandstone gravel with sandF3: Sub-vertical, planar smooth & rough, very open, @
		8.60-10.10	87	50	0					

Continued next sheet

Remarks: Water strike 4.2m

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				4.20	-	-

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 26th Mar 03

AGS

BOREHOLE LOG

RPS Planning, Transport and Environment

Borehole No. **BH59** Sheet 2 of 2

Project Name	Project No.	Client:	Site Location	Hole Type
South Hook LNG Terminal	JER2580	Qatargas ll	Milford Haven	C

Scale	Coordinates	Ground Level	Dates	Logged By
1:50	E N	43.510 m OD	18/09/2003-26/09/2003	WU/JO/GF/RG

Rotary Coring Depth (m)	TCR	SCR	RQD	FI	Level (m AOD)	Depth (m)
10.10-11.10	85	24	13	NI / 40 / 230		
					31.91	11.60
11.10-12.60	82	52	48	NI / 190 / 210		
					30.91	12.60
12.60-13.60	100	0	0	NI / NI / NI		
					29.91	13.60
13.60-15.10	97	54	35	30 / 190 / 570		
					28.91	14.60
				10 / 30 / 90		
					28.41	15.10
TCR	SCR	RQD	FI			

Description Of Strata

7.10m - 8.42m : Remaining Detail : 7.10m - 8.60m : 7.9-8.16, (heavily fractured multilaterally-highly fragmented rock)

8.42m - 8.60m : Red brown very strong SILTSTONE (SILTSTONE)

8.60m - 11.60m : Red brown strong fine sandstone, very ruggy from 9-10.85m (SANDSTONE)
Detail 8.60m - 11.10m : FROM 8.6 TO 11.1; Ni: 8.6-9.6, 10.85-9.4F1: Sub-vertical, , undulating smooth, moderately open, @ 8.6-9.6, Clay and sandy gravelF2: 45º, close-medium, planar rough, tight, @ 10.2, 10.3, 11.35, ClayF3: 70º, close, planar smooth, tight, @ 9.7, 9.9, clean, Black staining

Strong red brown SILTSTONE, rare ruggy dissolution's.
(SILTSTONE)
FROM 11.6 TO 12.6; Ni: 12.58-12.6F1: 45º, planar rough, open, @ 11.92, 12.41, Red brown sandy siltF2: 0º-20º, planar rough, open, @ 12.16, 12.43, Red brown sandy silt

Strong red brown SILTSTONE.
(SILTSTONE)
FROM 12.6 TO 13.6; Ni: 12.6-13.6F1: 45º, close, planar rough, very open, clayey sandy gravel, Gravel is fine-coarse angular siltstone, Some fractures coated with coated with light brown very soft clayF2: 70º, planar rough, moderately open, @ 13.17-13.45, Red brown sandy silt

Strong red brown SILTSTONE, rare ruggy dissolution's.
(SILTSTONE)
FROM 13.6 TO 14.6; F1: 20º, planar rough, moderately open, @ 13.7F2: 45º, planar rough, very tight @ 14.24, moderately open @ 14.48, 14.24, 14.48

Strong fine red brown SANDSTONE
(SANDSTONE)
FROM 14.6 TO 15.1; F1: 70º, medium, planar smooth, tight, @ 14.76, 15.05, cleanF2: 45º, planar rough, tight, @ 14.9, clean

End of Borehole at 15.10 m

Remarks: Water strike 4.2m

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				4.20	-	-

AGS

HoleBASE III (Bld 301) Standard Borehole Log v1 dated 29th Mar 03

WSP Management Services Ltd

WSP

Telephone:
Fax:

BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 60a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-02-05 08-02-05	35.040	E 187190.030 N 206408.220	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(4.60)	Red clay and MUDSTONE			
				30.44	4.60				
					(10.20)	Red MUDSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 60a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-02-05 08-02-05	35.040	E 187190.030 N 206408.220	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red MUDSTONE *(continued)*			
				20.24	14.80				
						Grey and red SILTSTONE			
			1		(10.20)				

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		20.00			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 60a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-02-05 08-02-05	35.040	E 187190.030 N 206408.220	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		3 of 3

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Grey and red SILTSTONE *(continued)*			
				10.04	25.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 61a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-02-05 08-03-05	36.330	E 187187.630 N 206189.930	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(1.10)	Red CLAY			
				35.23	1.10				
						Grey and brown SILTSTONE			
					(11.90)				

Boring Progress and Water Observations					
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt
Date	Time	Strike	Minutes	Standing	Casing
		8.00			

Chiselling			Water Added	
From	To	Hours	From	To

GENERAL REMARKS

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook Monitoring Well Reinstaments				**BH 61a**
Job No	Date	Ground Level (m NGR)	Co-Ordinates (NGR)	
13010481	08-02-05 08-03-05	36.330	E 187187.630 N 206189.930	
Supervising Engineer		Client		Sheet
S Gronow		South Hook LNG		2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Grey and brown SILTSTONE *(continued)*			
				23.33	13.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	
Date	Time	Strike	Minutes	Standing	Casing						

All dimensions in metres Scale 1:62.5	Contractor / Driller	Method/Plant Used	Logged By

WSP BH LOG NEWSHLNG.GPJ AGS3_ALL.GDT 31/10/05

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				BH 63A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	08-03-06 09-03-06	11.49	E 5,441.1 N 3,974.0	
Contractor				Sheet
Apex Drilling Services				1 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(1.00)	Made ground comprising of clayey MUDSTONE			
				10.49	1.00	Red silty MUDSTONE			
					(16.00)				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

AGS3 UK BH SHOOKLNGUPDATE.GPJ AGS3_ALL.GDT 19/7/06

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				BH 63A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	08-03-06 09-03-06	11.49	E 5,441.1 N 3,974.0	
Contractor				Sheet
Apex Drilling Services				2 of 2

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red silty MUDSTONE *(continued)*			
				-5.52	17.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				BH 65A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	44.01	E 5,559.4 N 4,897.4	
Contractor				Sheet
Apex Drilling Services				1 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(2.00)	Red SILTSTONE			
				42.01	2.00				
						Red silty MUDSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				**BH 65A**
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	44.01	E 5,559.4 N 4,897.4	
Contractor				Sheet
Apex Drilling Services				2 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(22.30)	Red silty MUDSTONE *(continued)*			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				BH 65A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	44.01	E 5,559.4 N 4,897.4	
Contractor				Sheet
Apex Drilling Services				3 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
						Red silty MUDSTONE *(continued)*			
				19.71	24.30				
						Light brown silty SANDSTONE			
					(3.30)				
				16.41	27.60				
			▼			Red SILTSTONE			

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

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BOREHOLE LOG

Project				BOREHOLE No
South Hook LNG				BH 65A
Job No	Date	Ground Level (m)	Co-Ordinates ()	
13010481	13-03-06 13-03-06	44.01	E 5,559.4 N 4,897.4	
Contractor				Sheet
Apex Drilling Services				4 of 4

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend		
					(5.40)	Red SILTSTONE *(continued)*			
				11.01	33.00				

Boring Progress and Water Observations						Chiselling			Water Added		GENERAL REMARKS
Date	Time	Depth	Casing Depth	Casing Dia. mm	Water Dpt	From	To	Hours	From	To	

All dimensions in metres Scale 1:62.5	Client South Hook LNG	Method/ Plant Used	Logged By G. James

AGS3 UK BH SHOOKLNGUPDATE.GPJ AGS3_ALL.GDT 19/7/06

RPS Planning, Transport and Environment

Rotary Borehole Log

Borehole No. BHG2

Site Name: Milford Haven

Client Name: Qatargas II

Drilling Method: Klemm 802

Borehole Diameter: 200mm

Contractor Apex Drilling

Core Diameter: 76mm

Depth	Sample Reference	Installation	Core recovery: Core Run (From/To)	TCR	SCR	RQD	Fracture Index (min/avg/max)	In Situ Tests	Description of Strata	Lithology	Level (mbGL)	Level (mAOD)	Depth
0									Recovered as red brown gravel size fragments of SILTSTONE				0
1			1.5-3.00m	1.5-3m 100%	1.5-3m 37%	1.5-3m 10%	1.5-4.5m NI/60/160		Strong grey fractured fine SANDSTONE.		1.50	33.31	1
2													2
3			3-4.50m	3-4.5m 95%	3-4.5m 40%	3-4.5m 21%		N= 50/70mm	Strong red brown SILTSTONE. Fracture set 1 - Extremely closely spaced fractures @ 3.3-3.6m Fracture set 2 - Closely spaced, 70 degree dip, planar moderately open Fracture set 3 - Closely spaced, 45 degree dip, planar moderately open Fracture set 4 - Closely spaced, sub horizontal, undulating, open, filled with gravelly sand silt		3.26	31.55	3
4			4.5-6m	4.5-6m 100%	4.5-6m 7%	4.5-6m 0%	4.5-7.5m NI/50/110	N= 50/73mm	Moderately strong to strong red brown SILTSTONE. Fracture set 1 @ 4.5-4.73, 5.16-5.26, 7.07-7.10, extremely close spaced, 45 degree planar and rough Fracture set 2 - Closely spaced 30 degree, planar rough, moderately open, dark grey stained Fracture set 3 - Closely spaced 45 degree, planar rough, moderately open, dark grey stained Fracture set 4 - Sub vertical planar rough, open undulating filled, black stained, slightly sandy SILT/CLAY		4.50	30.31	4
5								N= 50/71mm					5
6			6-7.5m	6-7.5m 100%	6-7.5m 43%	6-7.5m 21%		N= 50/73mm					6
7			7.5-8m	7.5-8m 100%	7.5-8m 0%	7.5-8m 0%	7.5-10.5m NI/90/250		Moderately strong to strong red brown SILTSTONE, mottled grey white between 8.50 to 10m Fracture set 1 Extremely closely spaced fractures @ 8-8.50m Fracture set 2 - Medium to closely spaced, 45 degree dip, planar, rough, tight to moderately open, orange stained some are filled by a thin layer of red brown clay Fracture set 3 - 7.5-8m, 10.2-10.5m, subvertical, planar, smooth, moderately open		7.50	27.31	7
8			8-8.5m	8-8.5m 100%	8-8.5m 0%	8-8.5m 0%							8
9			8.5-10m	8.5-10m 100%	8.5-10m 43%	8.5-10m 56%							9
10			10-10.5m										10

Groundwater Strikes - Depth (mbGL)

Strike Number	Strike Depth	Rest Level	Sample No.	Notes

Eastings: 187595.00

Northings: 205571.26

Ground Level (mAOD): 34.81

Comments: Hydrocarbon odour and sheening noted on recovered groundwater during drilling

Start Date: 04/11/02

End Date: 04/11/02

Logged By: GF

Rotary Borehole Log

RPS Planning, Transport and Environment

Borehole No.	BHG2
Site Name:	Milford Haven
Client Name:	Qatargas II
Drilling Method:	Klemm 802
Borehole Diameter:	100mm
Contractor	Apex Drilling
Core Diameter:	76mm

Depth	Sample Reference	Installation	Core recovery: Core Run (From/To)	TCR	SCR	RQD	Fracture Index (min/avg/max)	In Situ Tests	Description of Strata	Lithology	Level (mbGL)	Level (mAOD)	Depth
11–20	C11		11.5-13m 13-13.5m	10.5-11.5: 100% 11.5-13m: 100% 13-13.5m: 100% 13-13.5m: 100%	10.5-11.5: 72% 11.5-13m: 9% 13-13.5m: 100%	10.5-11.5: 54% 11.5-13m: 54% 13-13.5m: 72%	10.5-13.5: NI/100/360		Moderately strong red brown SILTSTONE. Fracture set 1 - 10.50-10.72, 11.40-11.62, 12.10-12.15, 12.45-12.50, 13.02-13.11, extremely close spaced 45 degree, planar rough Fracture set 2 - closely spaced, 45 degree dip, moderately open, planar rough, dark grey mottled staining Fracture set 3 - 10.50-11.39, 12.39-13.10, sub vertical planar, rough open undulating, black stained infill, slightly weathered with black stained silty gravel infill. Gravel is fine to coarse and tubular mudstone		13.50	21.31	11–20

Groundwater Strikes - Depth (mbGL)

Strike Number	Strike Depth	Rest Level	Sample No.	Notes

Eastings:	187595.00
Northings:	205571.26
Ground Level (mAOD):	34.81

Comments:

Start Date:	04/11/02
End Date:	04/11/02
Logged By:	GF
Page No.	2 of 2

ROTARY BOREHOLE LOG

Borehole No. **MW01**
Sheet 1 of 1

Project Name: Skim Pond	Coordinates	Drilling Method: Commachio Rig	Casing Details		Hole Type
Project No. JER4238	Northings: -	Start Date: 27/11/2009	Hole Diameter (mm)	Casing Depth (m)	Rotary
Location: Milford Haven	Eastings: -	End Date: 30/11/2009	100	7.00	Scale 1:50
Client: South Hook LNG	Ground Level: 6.380 m OD	Logged By: AP			

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata
					6.08	0.30		Grey brown gravelly cobbly SAND. Gravel is subangular to angular green grey blue red sandstone. (MADE GROUND)
								Red grey brown slightly clayey slightly gravelly SAND. Very large subrounded cobble at 0.6 - 0.7m. (MADE GROUND)
	▽				4.38	2.00		Grey occasionally brown red CLAY. Contaminated. Moderate hydrocarbon odour. PID = 3.2 ppm (peak), 0.5 ppm (average). (MADE GROUND)
					3.88	2.50		Grey soft gravelly CLAY. Gravels are subangular to angular dark grey stone. (MADE GROUND)
					3.58	2.80		Red brown clayey GRAVEL. Gravels and cobbles are subangular to angular of red fine grained sandstone. (WEATHERED DEVONIAN SANDSTONE)
					1.98	4.40		Firm to stiff red brown gravelly CLAY. (WEATHERED DEVONIAN SANDSTONE)
					1.38	5.00		Yellow brown clayey GRAVEL. Gravel is subangular to angular red fine grained sandstone. (WEATHERED DEVONIAN SANDSTONE)
					1.08	5.30		Strong to very strong red fine grained SANDSTONE. (DEVONIAN SANDSTONE)
					0.38	6.00		No Recovery
		7.50-8.50	45	0 0	-1.12	7.50		Strong to very strong fractured red SANDSTONE. Fractures are 80 - 90 degrees, black staining. Subangular to angular gravels and cobbles present. (DEVONIAN SANDSTONE)
					-2.12	8.50		End of Borehole at 8.50 m

TCR | SCR | RQD | FI

Remarks: Water strike at about 2 mBGL.

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				2.00	-	-

AGS

HoleBASE III (Bid 422.00) Standard Borehole Log v1 dated 26th Mar 03

ROTARY BOREHOLE LOG

Borehole No. **MW03**
Sheet 1 of 2

Project Name: Skim Pond	Coordinates	Drilling Method: Commachio Rig	Casing Details		Hole Type
Project No. JER4238	Northings: -	Start Date: 09/11/2009	Hole Diameter (mm)	Casing Depth (m)	Rotary
Location: Milford Haven	Eastings: -	End Date: 11/11/2009	100	10.00	Scale 1:50
Client: South Hook LNG	Ground Level: 11.430 m OD	Logged By: AP			

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results	Level (m AOD)	Depth (m)	Legend	Description Of Strata	
					11.35	0.08		Grey slightly silty slightly sandy angular to subangular GRAVEL of tarmacadam. (MADE GROUND)	
					11.18	0.25		Grey brown gravelly silty fine SAND. (MADE GROUND)	10.93
								Firm to stiff slightly gravelly red CLAY with occasional subangular to angular gravels of sandstone. Mainly friable. Moist below 4 m. Fine to medium subangular to angular gravels of red mudstone at 7.8 - 8.1m. Occasional limestone gravels and cobbles at 2.8m.	10.43 9.93 9.43 8.93 8.43 7.93 7.43 6.93 6.43 5.93 5.43 4.93 4.43 3.93 3.43
					3.13	8.30		No Recovery	2.93
					2.53	8.90		Soft to firm red brown to dark brown slightly gravelly CLAY. Gravels are subangular to angular red sandstone. Moist. Large grey sandstone cobble at 9.7m.	2.43 1.93
			Type	Results				Continued next sheet	

Remarks: Water strike at about 10 mBGL.

Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				10.00	-	-

HoleBASE III (Bid 422.00) Standard Borehole Log v1 dated 26th Mar 03

ROTARY BOREHOLE LOG

Borehole No. **MW03**
Sheet 2 of 2

Project Name: Skim Pond	Coordinates	Drilling Method: Commachio Rig	Casing Details		Hole Type
Project No. JER4238	Northings: -	Start Date: 09/11/2009	Hole Diameter (mm)	Casing Depth (m)	Rotary
Location: Milford Haven	Eastings: -	End Date: 11/11/2009	100	10.00	Scale 1:50
Client: South Hook LNG	Ground Level: 11.430 m OD	Logged By: AP			

Well	Water Strikes	Samples & In Situ Testing Depth (m)	Type	Results			Level (m AOD)	Depth (m)	Legend	Description Of Strata
							1.43	10.00		Soft dark brown to red brown gravelly organic CLAY. Gravels are subangular to angular red sandstone.
							1.03	10.40		
							0.93	10.50		Light brown gravelly slightly cobbly CLAY. Gravels and cobbles are red sandstone.
							0.68	10.75		
		10.50-12.00	91	83	31					Red brown subrounded to subangular coarse GRAVEL and cobbles of sandstone. (WEATHERED DEVONIAN SANDSTONE)
										Strong to very strong red fine grained SANDSTONE. Fracture at 10.75m (open), 10.9m (infilled with subangular to angular sandstone gravel). Subvertical and subhorizontal fractures. Open fracture at 11.2m. Undulating closed to slightly open fracture infilled with fine gravels. (DEVONIAN SANDSTONE)
							-0.22	11.65		
							-0.32	11.75		
							-0.57	12.00		
		12.00-13.00	81	37	12		-0.97	12.40		Red brown subrounded to subangular coarse GRAVEL and cobbles of fine grained sandstone. (DEVONIAN SANDSTONE)
										Strong to very strong red fine grained SANDSTONE. (DEVONIAN SANDSTONE)
										Subrounded to subangular COBBLES and fine to coarse subrounded to subangular GRAVEL of red fine grained sandstone. (WEATHERED DEVONIAN SANDSTONE)
		13.00-14.50	98	89	79					Strong to very strong red fine grained SANDSTONE. Gravels and cobbles at 14.6 to 14.7m. Open fracture, 0 - 10 degrees, at 13.1m. Closed fracture, 30 - 40 degrees, at 13.12 - 13.20m. Broken fractured rock at 13.25 - 12.4m. Open fracture, 0 - 10 degrees, at 13.6m. Occasional minor fractures along core length. Slightly closed slightly filled fractures, 30-40 degrees, subangular to angular fine to coarse gravels. Open possible drilling induced fractures at 14.3 - 14.35m, 14.15 - 14.28m. (DEVONIAN SANDSTONE)
		14.50-16.00	77	49	22					
							-4.27	15.70		Highly fractured strong to very strong fine grained SANDSTONE. Comprises fine to coarse angular to subangular gravels with some light brown sandy clay / sand. (DEVONIAN SANDSTONE)
							-4.57	16.00		End of Borehole at 16.00 m
			TCR	SCR	RQD	FI				

0.93 0.43 -0.07 -0.57 -1.07 -1.57 -2.07 -2.57 -3.07 -3.57 -4.07 -4.57 -5.07 -5.57 -6.07 -6.57 -7.07 -7.57 -8.07

Remarks: Water strike at about 10 mBGL.

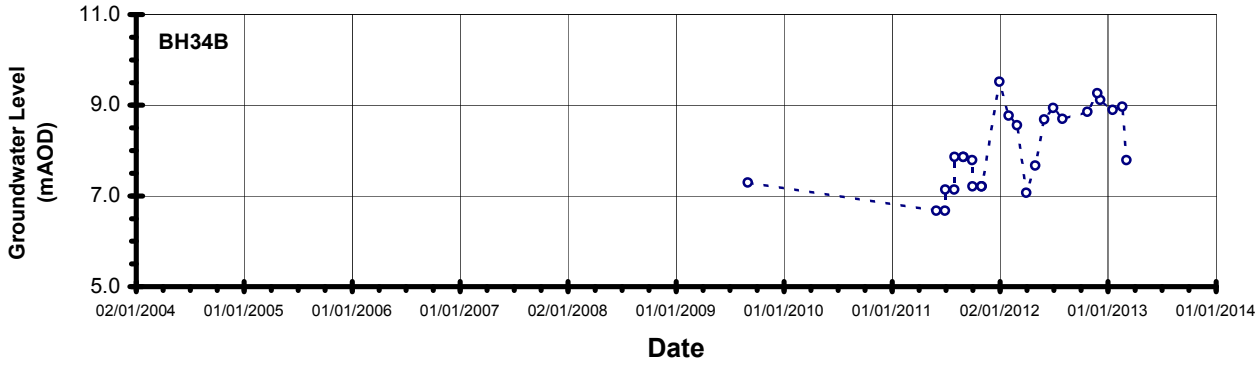
Chiselling Details				Groundwater Notes		
Time Taken	Depth From (m)	Depth To (m)	Tool Used	Strike (m)	Casing Depth (m)	Level After 20 Mins (m)
				10.00	-	-

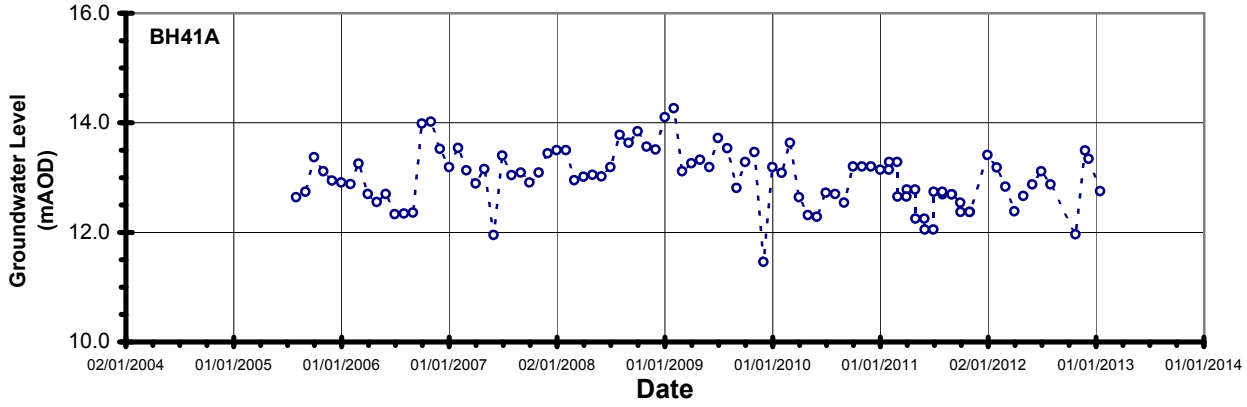
HoleBASE III (Bid 422.00) Standard Borehole Log v1 dated 26th Mar 03

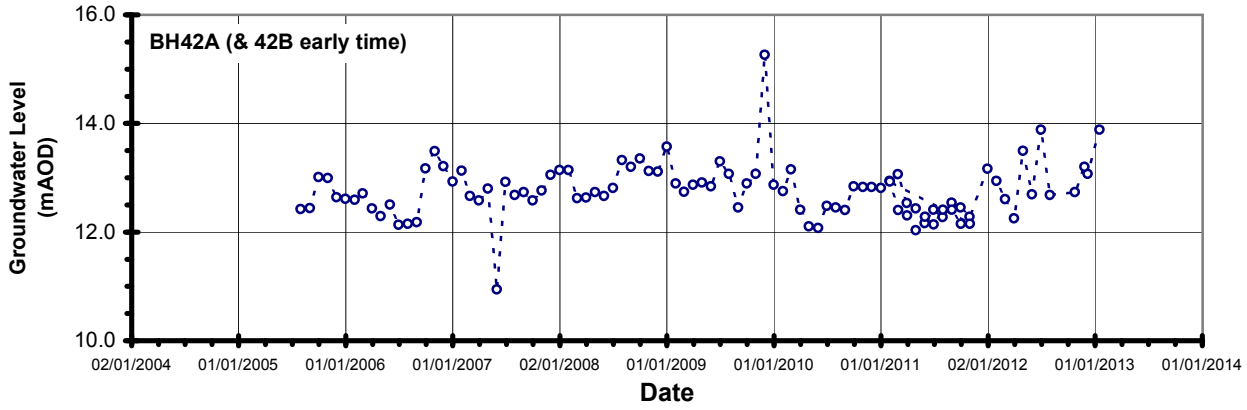
Appendix 3

Groundwater Levels ï Time Series Charts

CHART 1.1: Monitoring Locations Situated **Inside Green Fence**







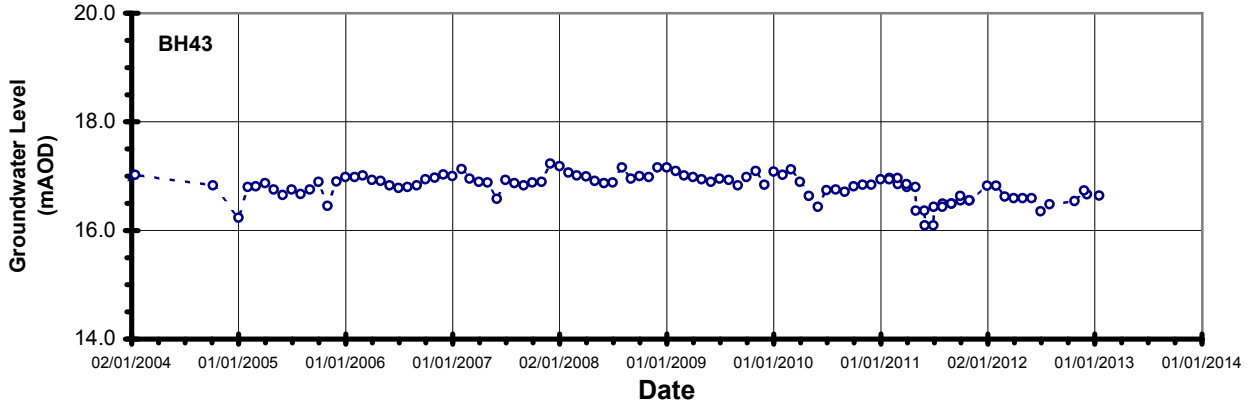
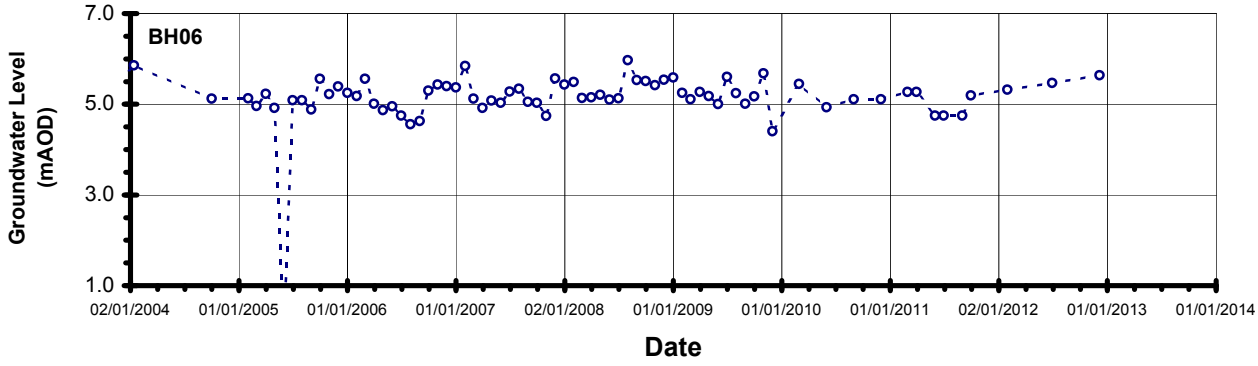
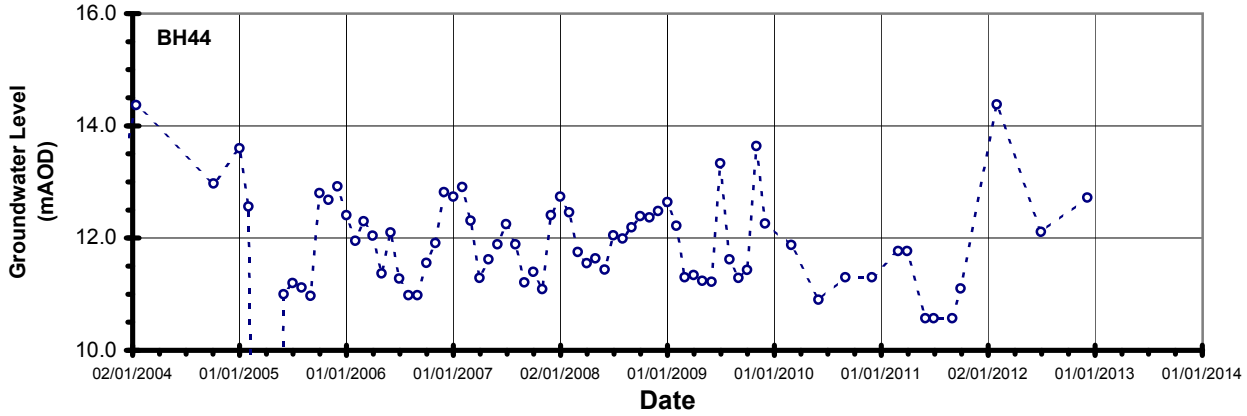
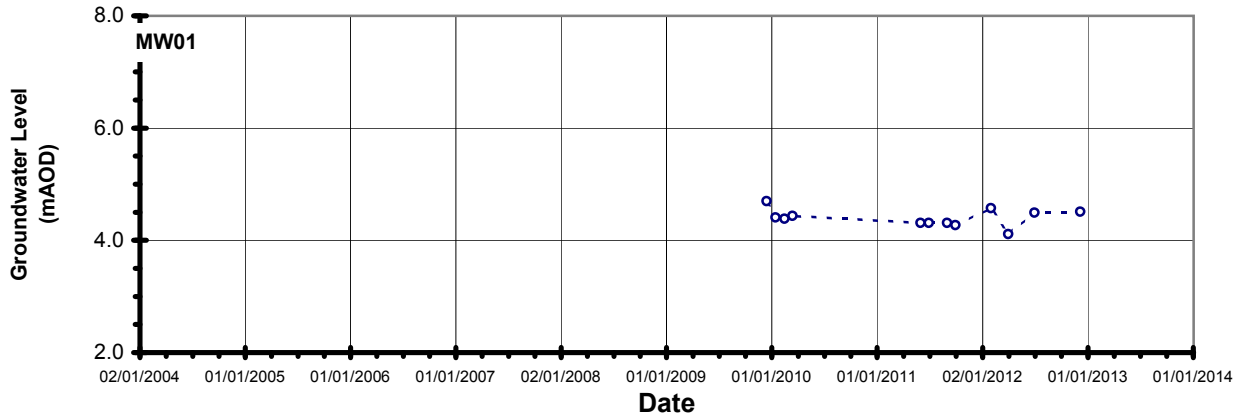


CHART 1.2: Monitoring Locations Situated **Inside Green Fence**







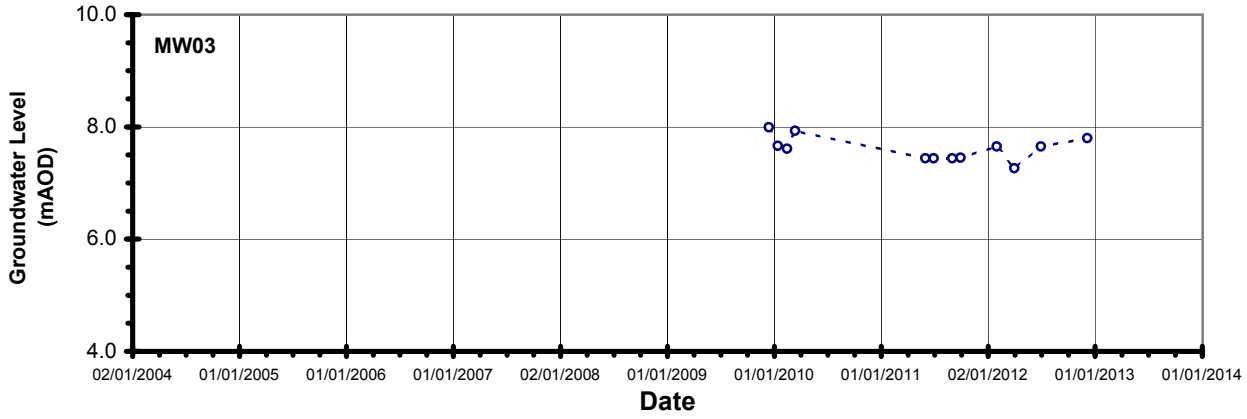
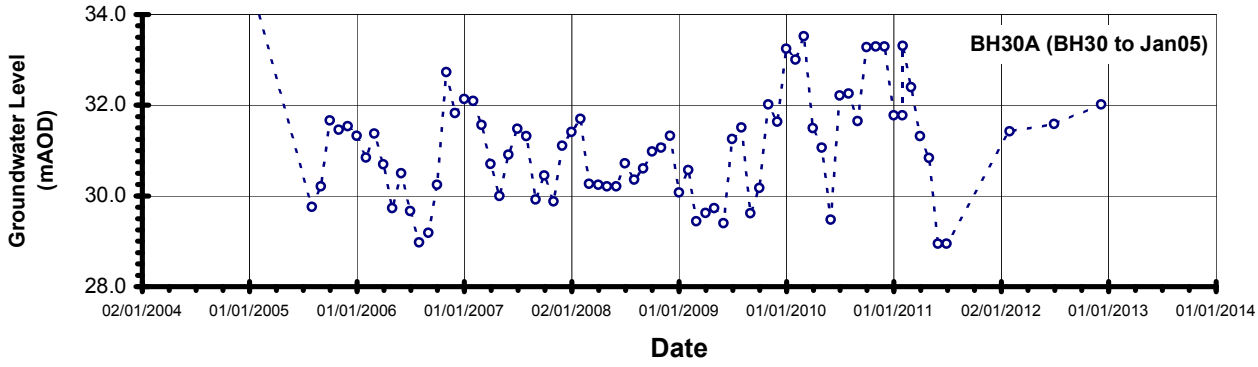
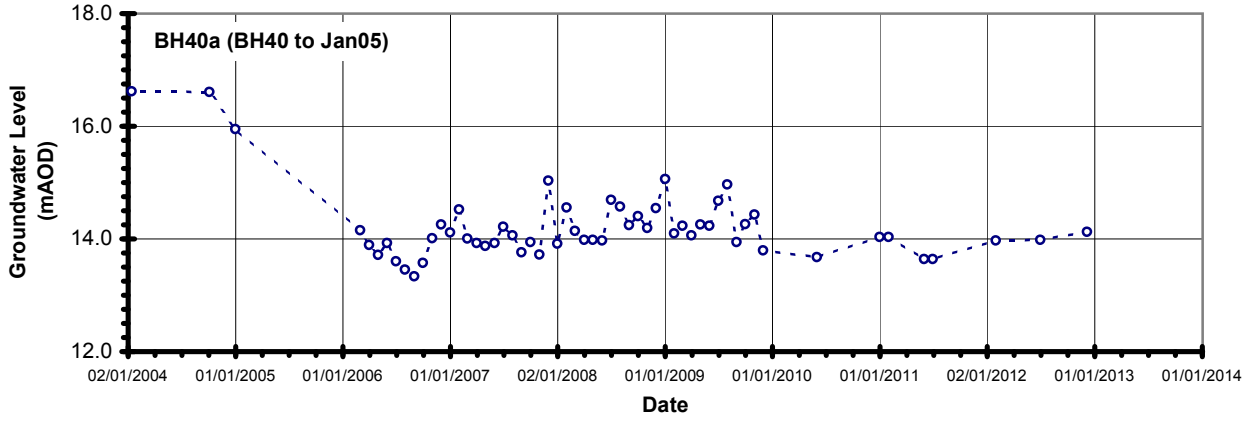
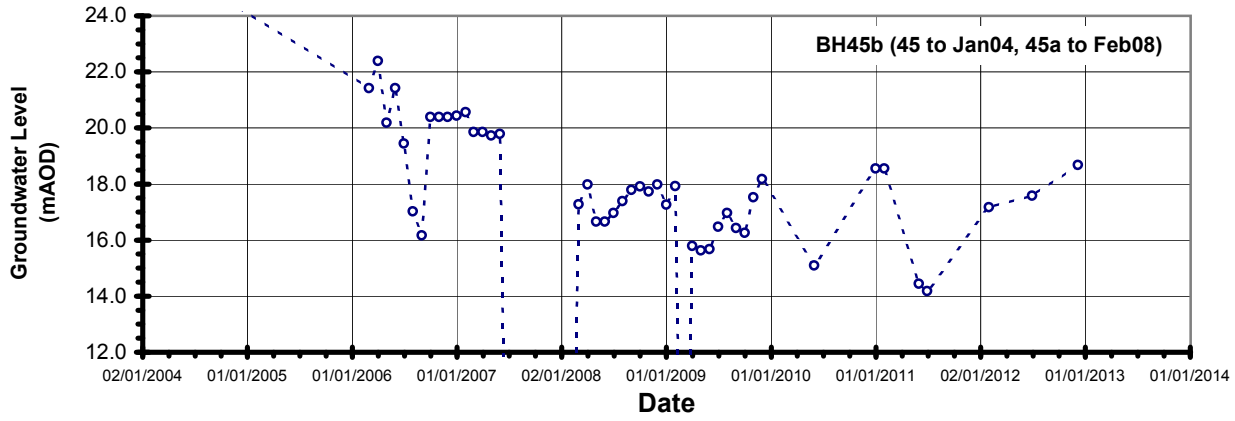


CHART 1.3: Monitoring Locations Situated **Inside Green Fence**







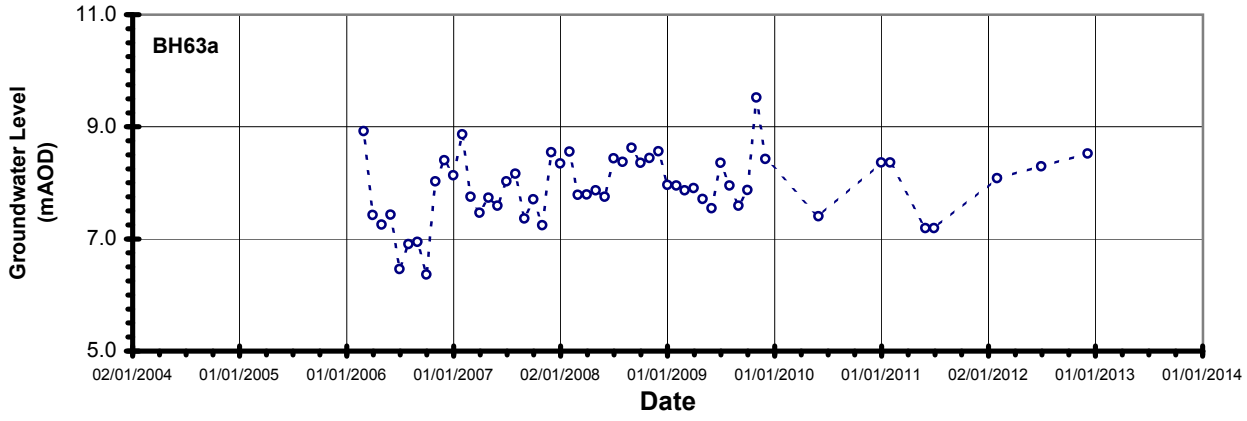


CHART 1.4: Montoring Locations Situated **Inside Green Fence**

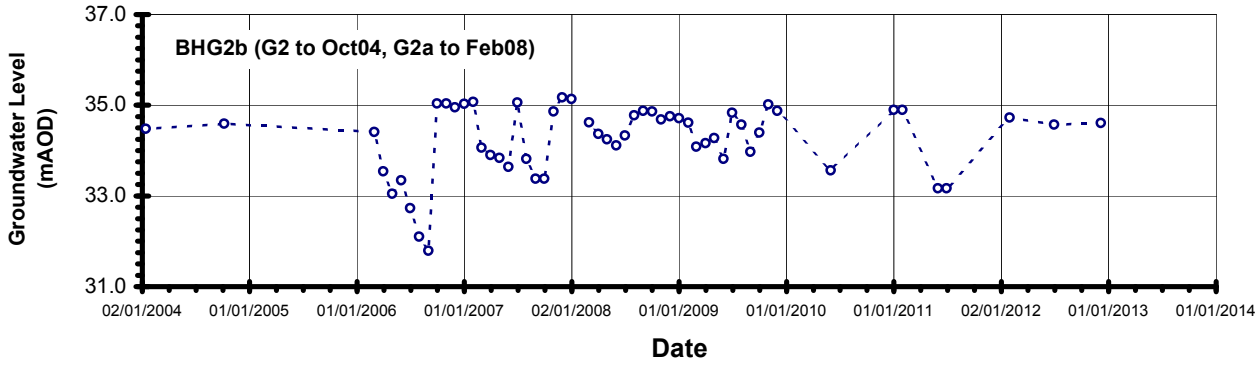
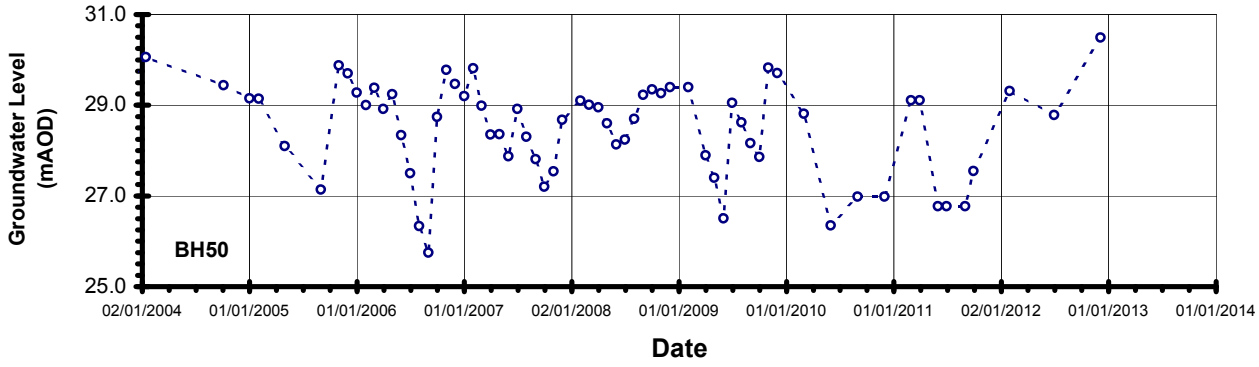
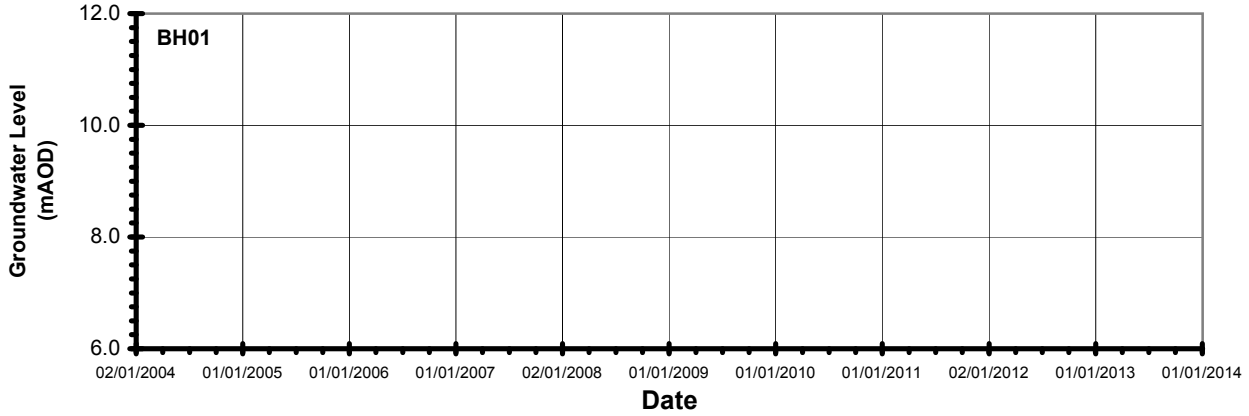
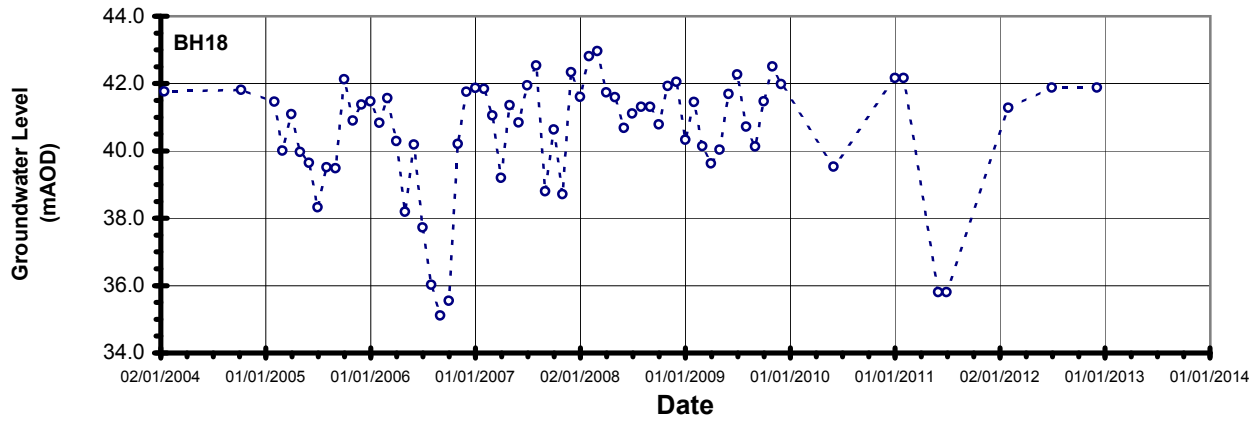


CHART 2.1: Montoring Locations Situated **Outside Green Fence**







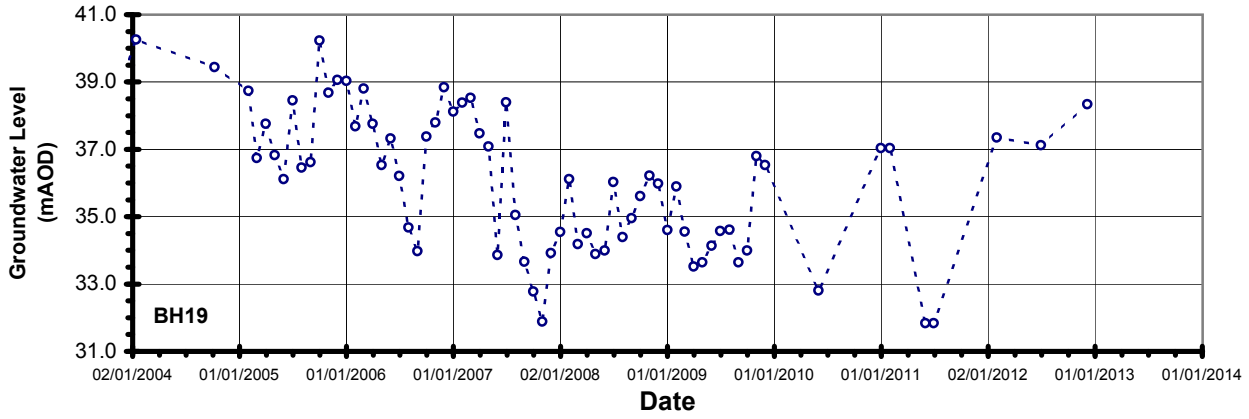
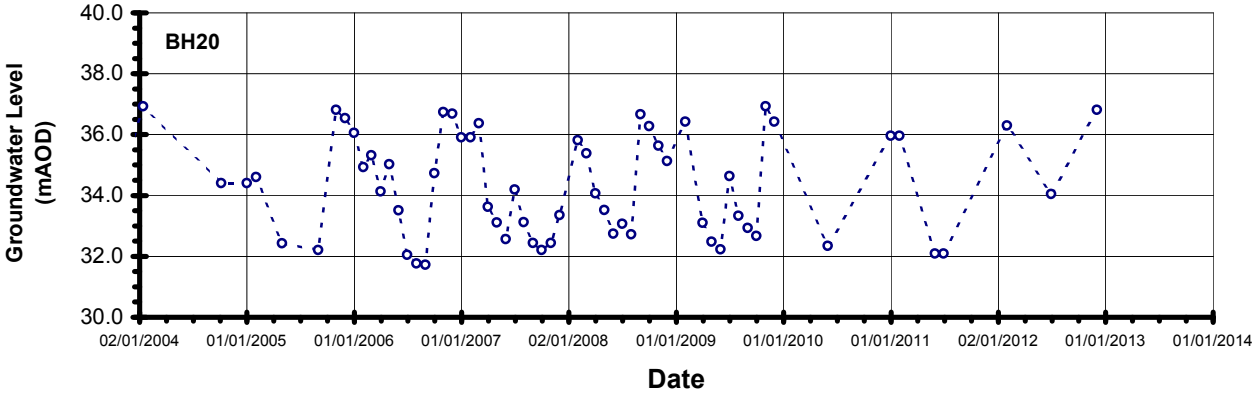
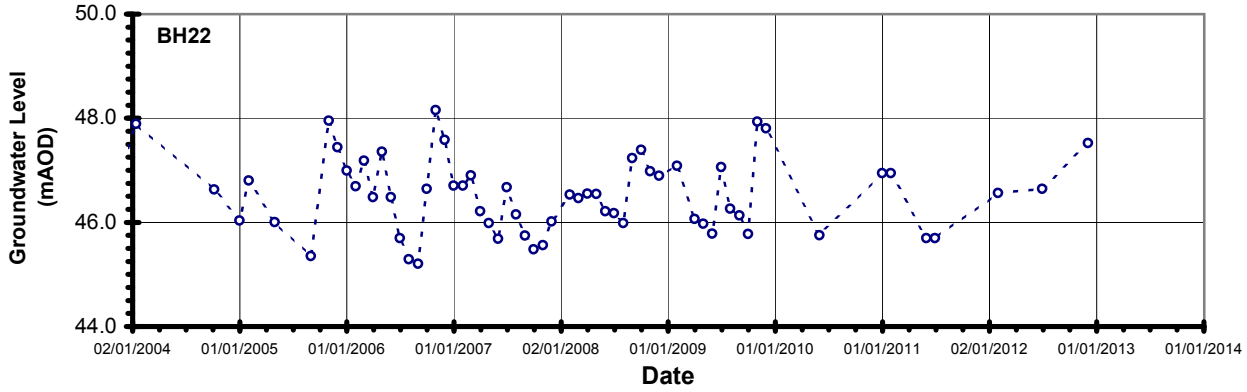
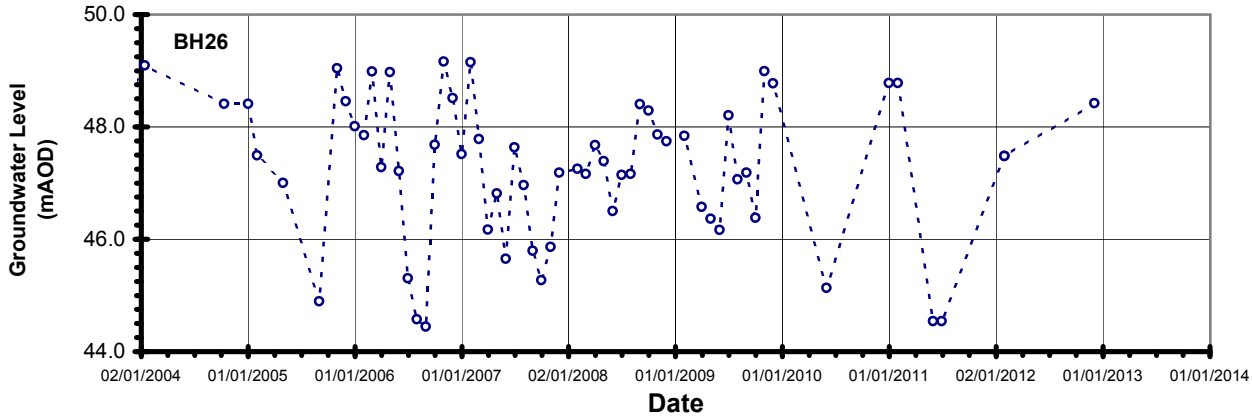


CHART 2.2: Monitoring Locations Situated **Outside Green Fence**







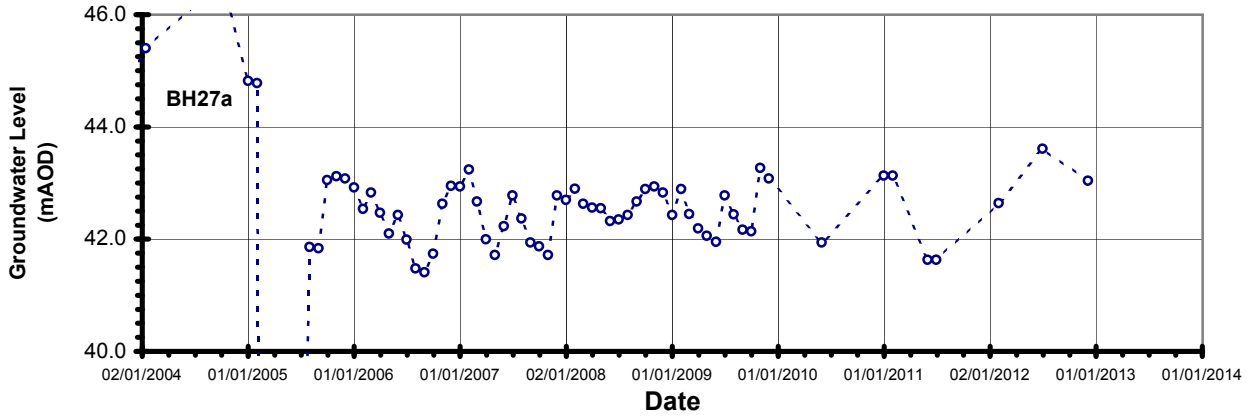
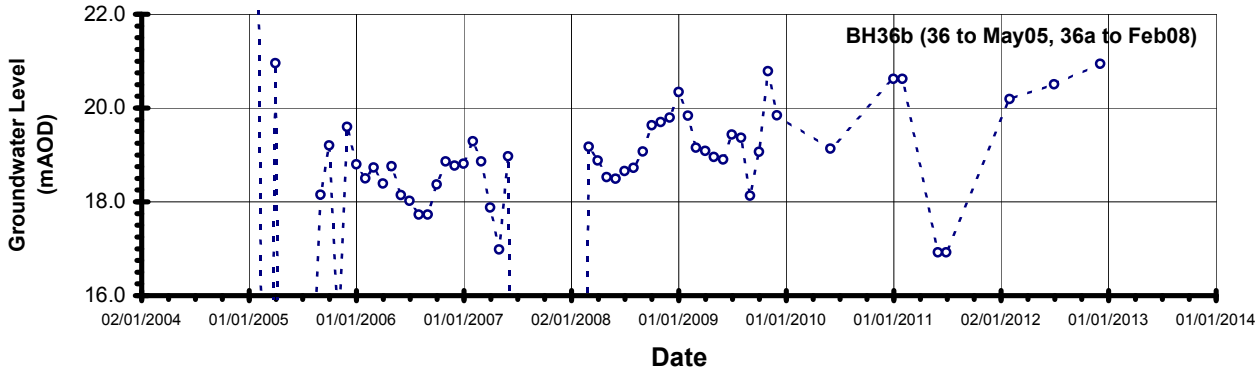
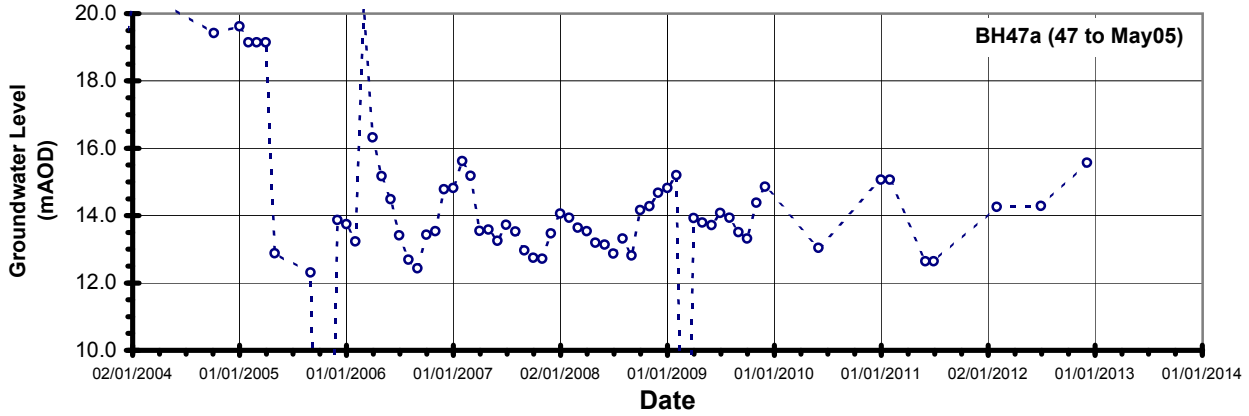
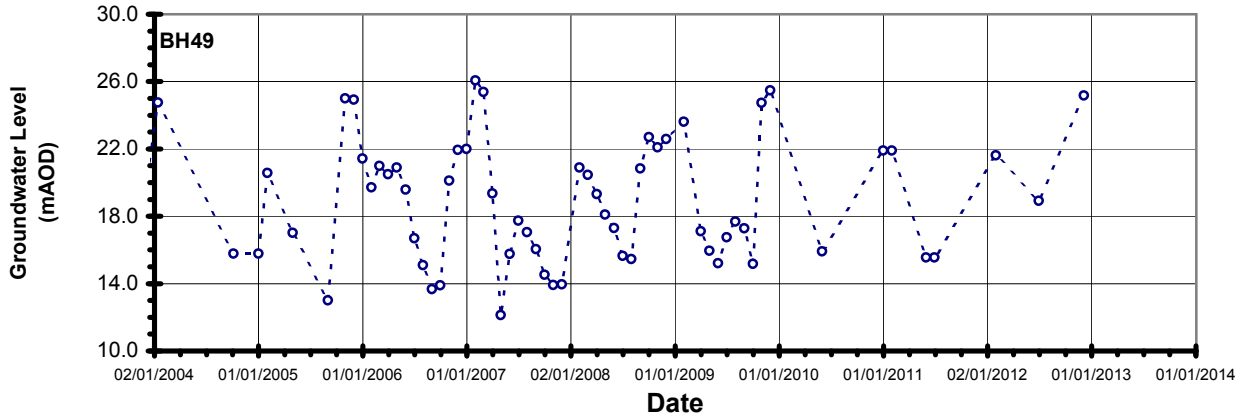


CHART 2.3: Monitoring Locations Situated **Outside Green Fence**







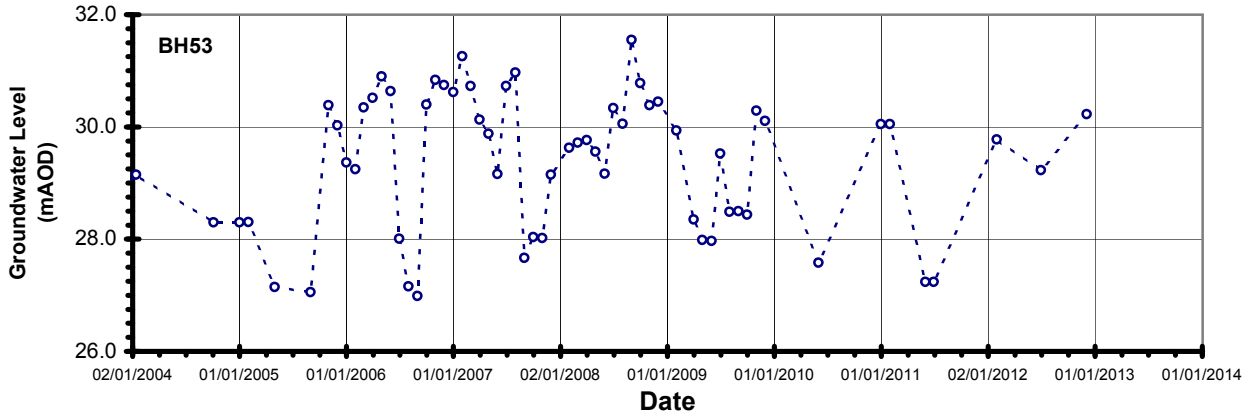
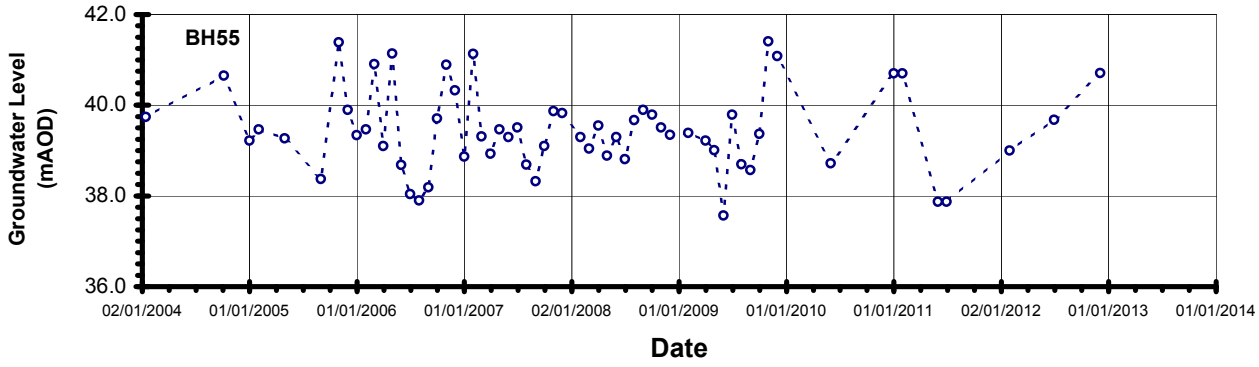
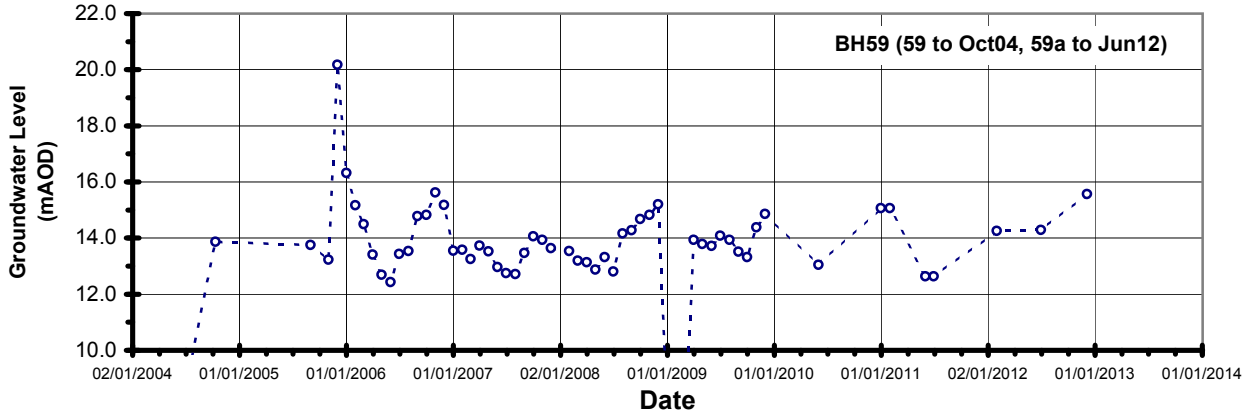
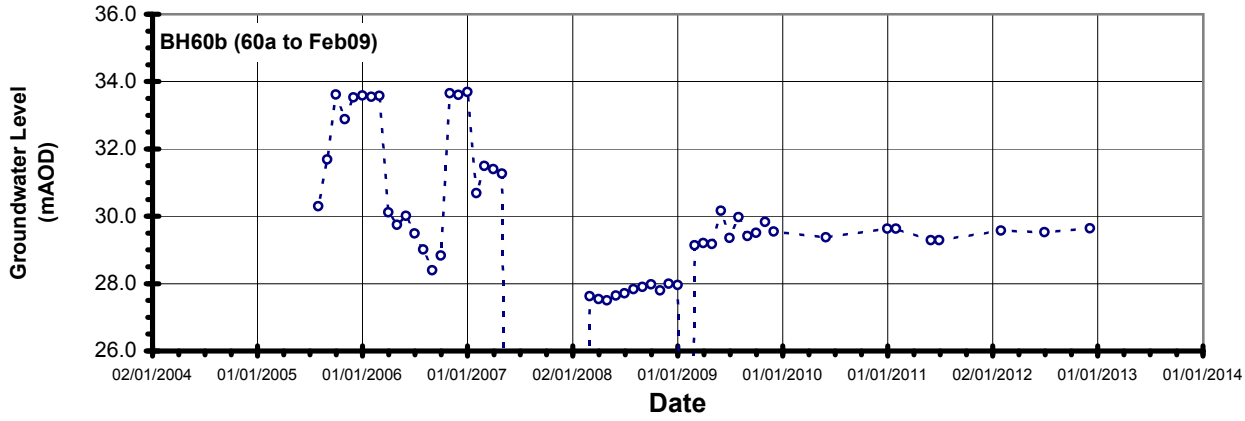


CHART 2.4: Monitoring Locations Situated **Outside Green Fence**







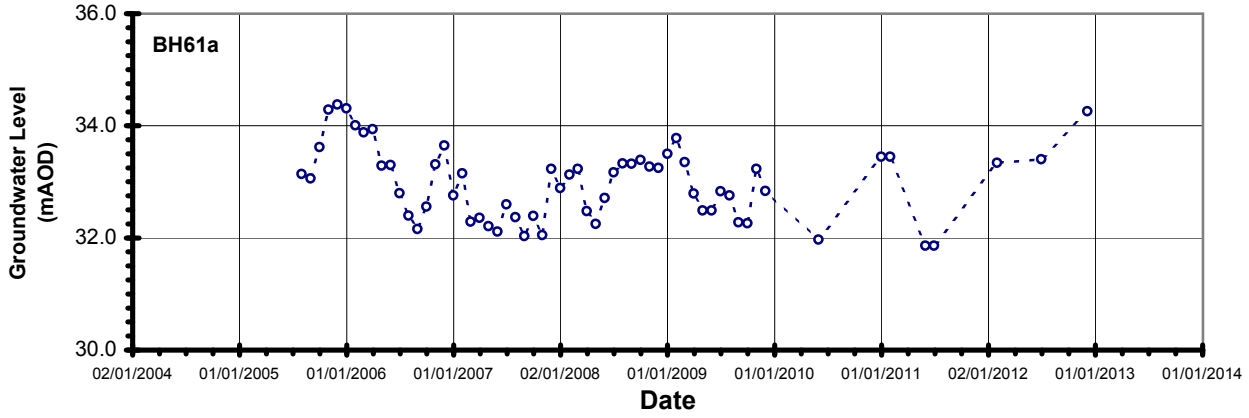
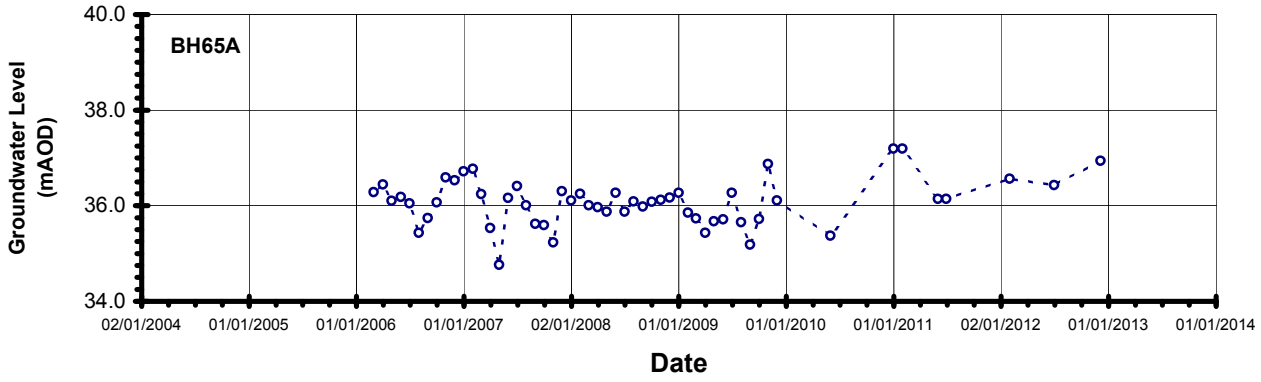


CHART 2.5: Monitoring Locations Situated **Outside Green Fence**

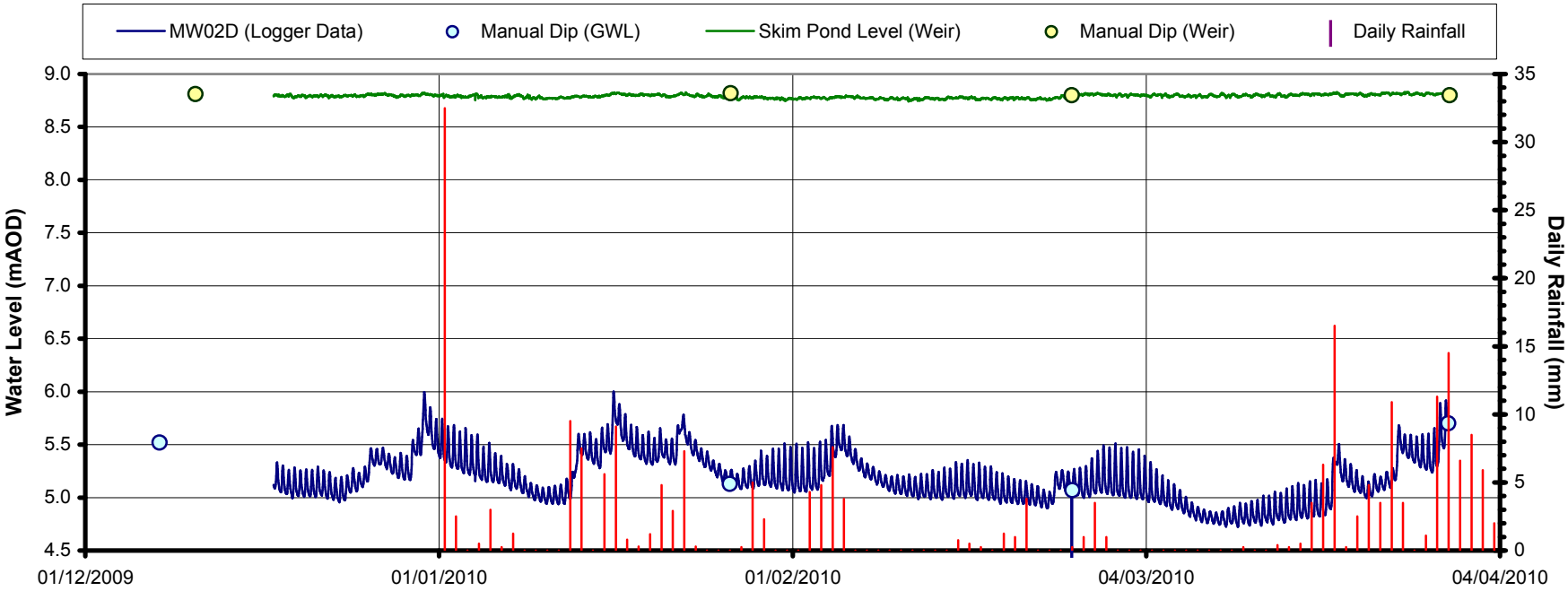


Appendix 4

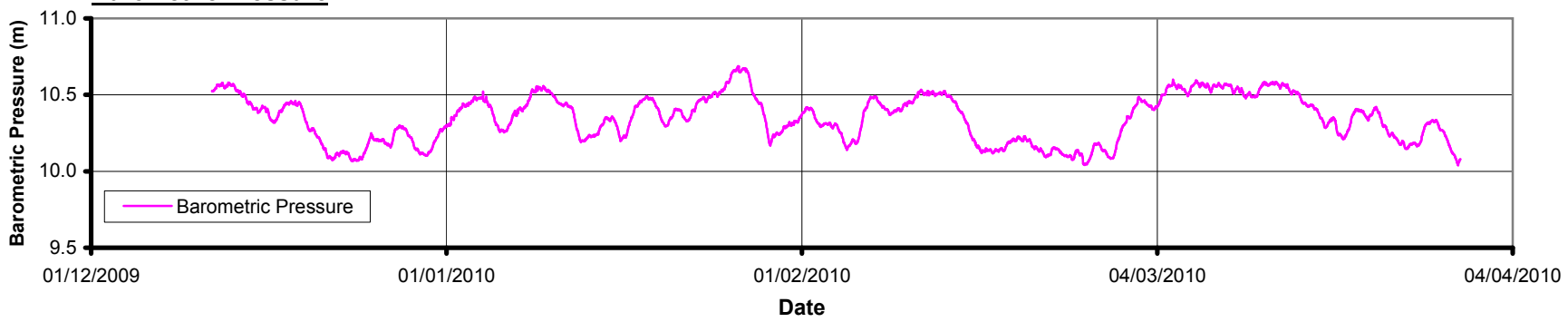
Groundwater Levels ï Logger Data for Skim Pond

MW02D

Corrected Groundwater Level, Pond Level & Rainfall

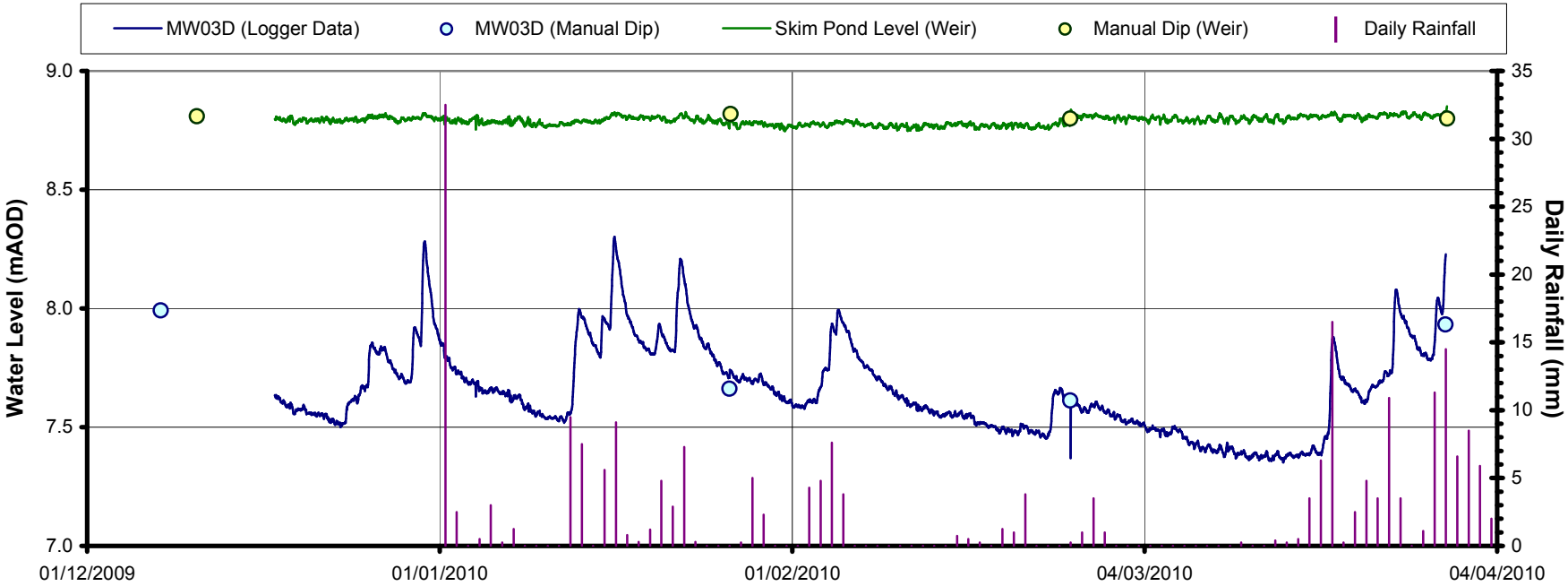


Barometric Pressure

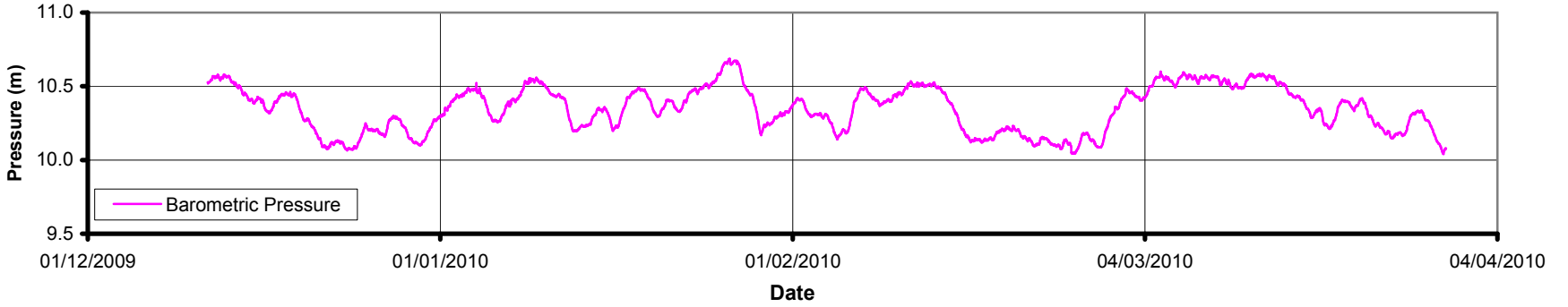


MW03D

Corrected Groundwater Level, Pond Level & Rainfall

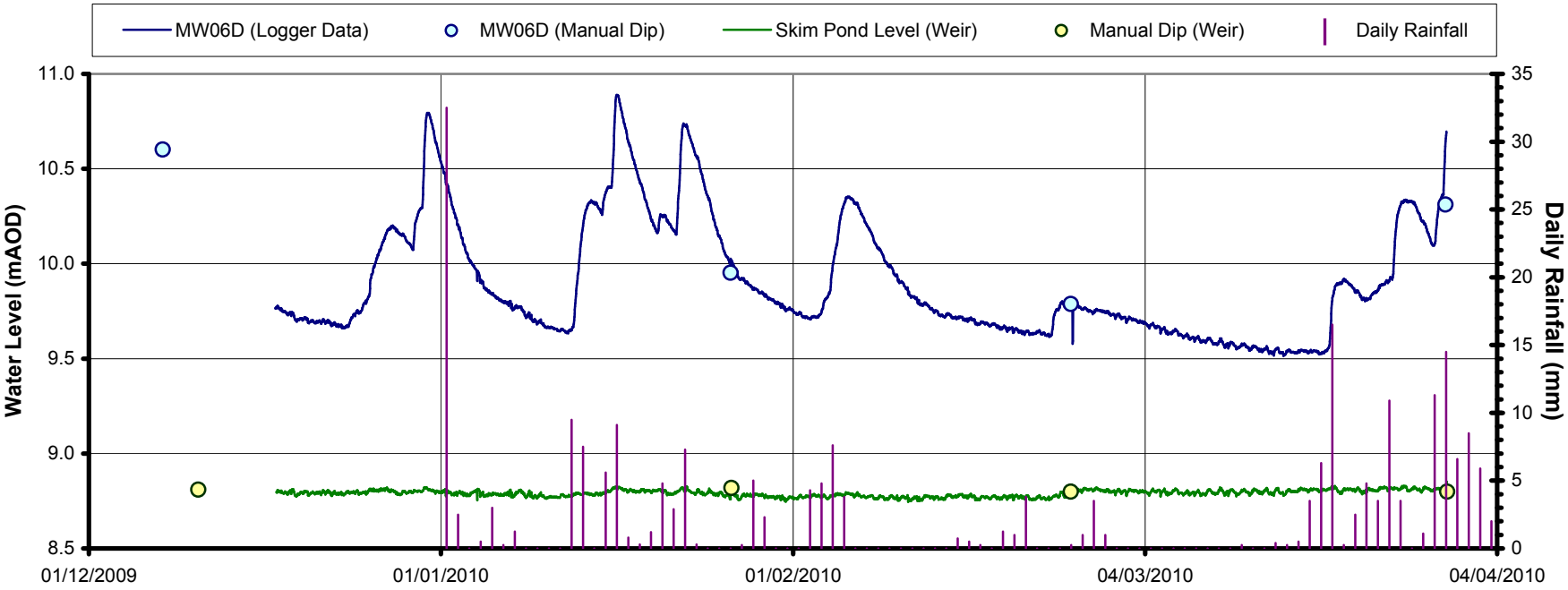


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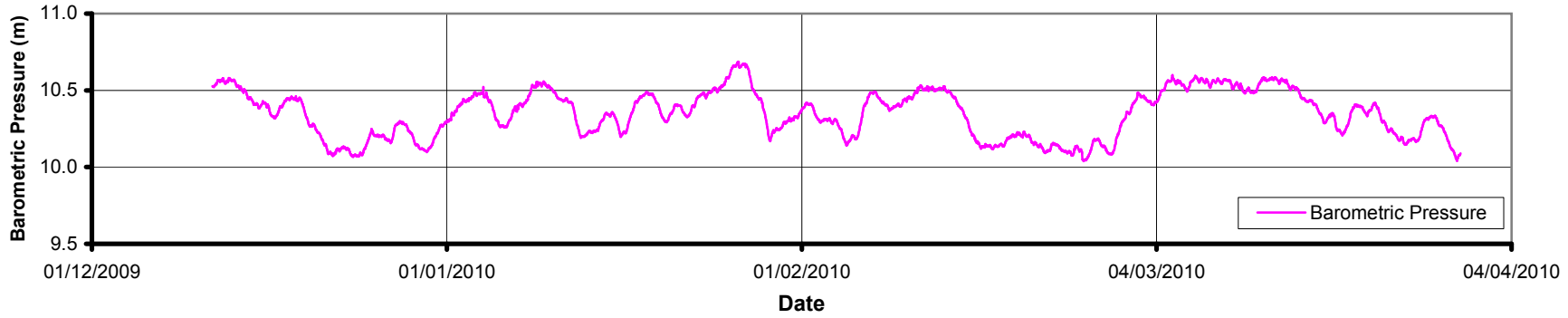


MW06D

Corrected Groundwater Level, Pond Level & Rainfall

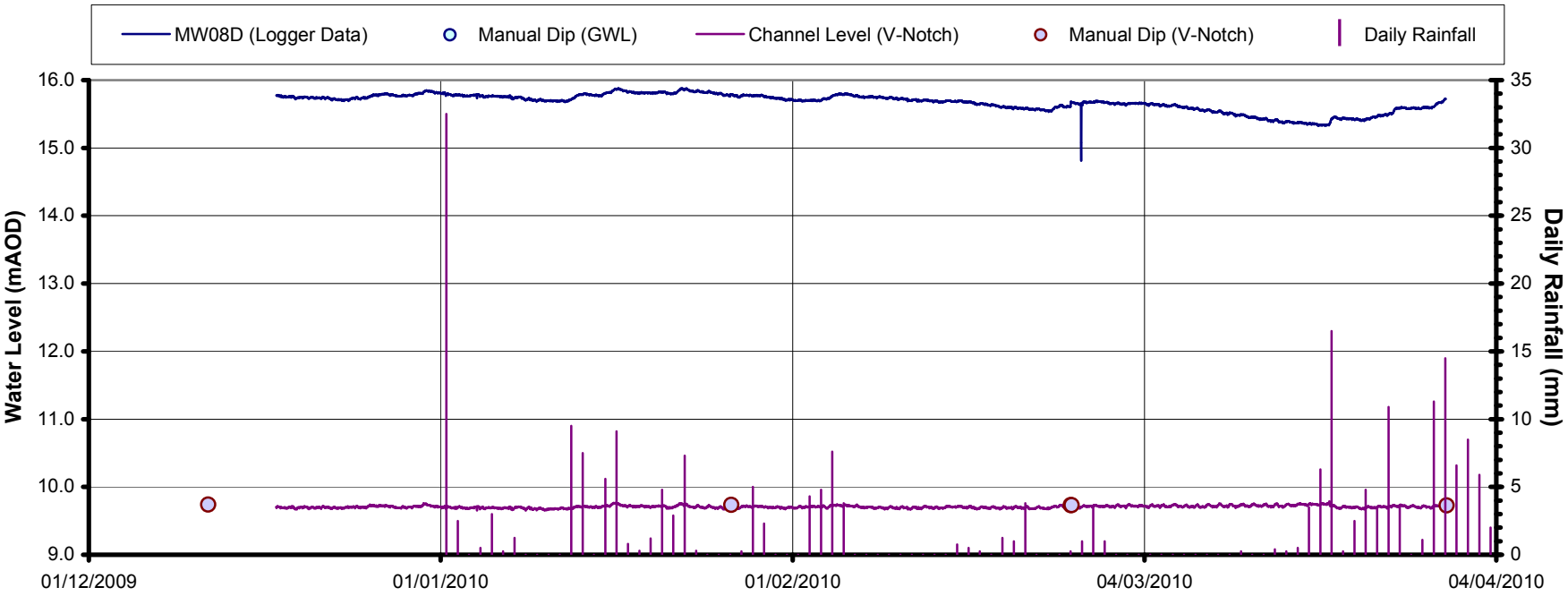


Barometric Pressure

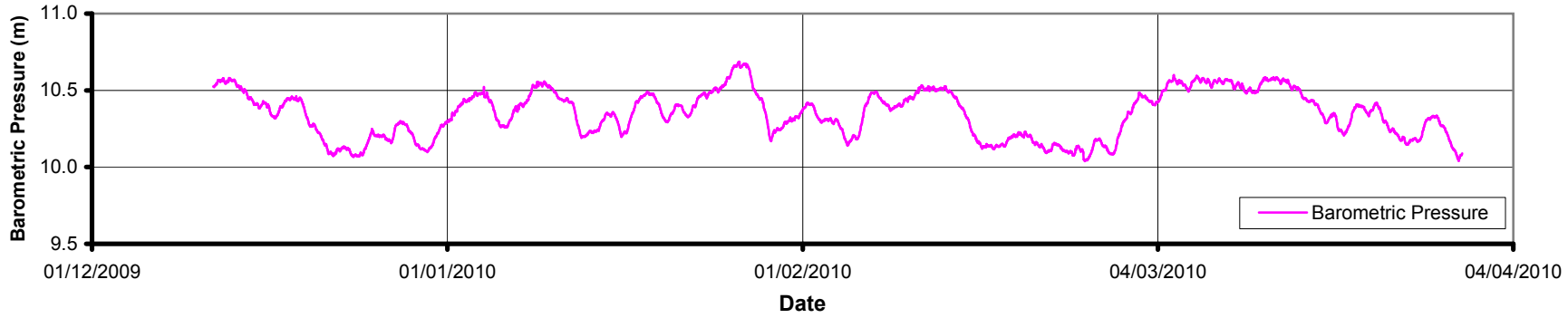


MW08D

Corrected Groundwater Level, Pond Level & Rainfall

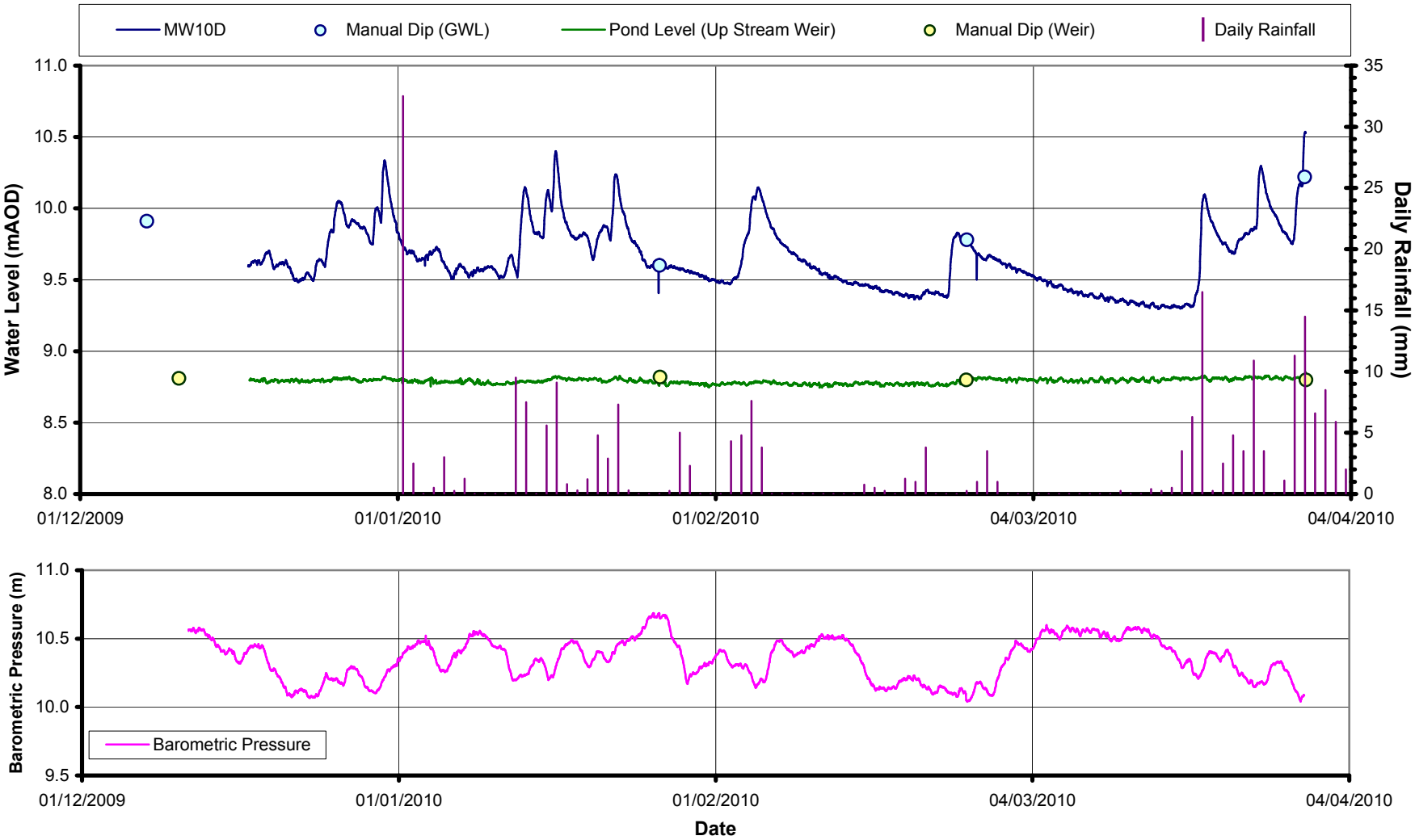


Barometric Pressure



MW10D

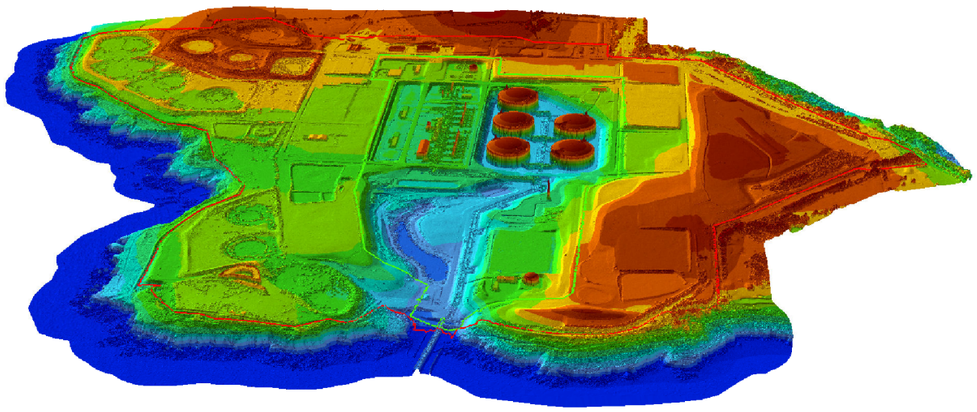
Corrected Groundwater Level, Pond Level & Rainfall



Appendix 5

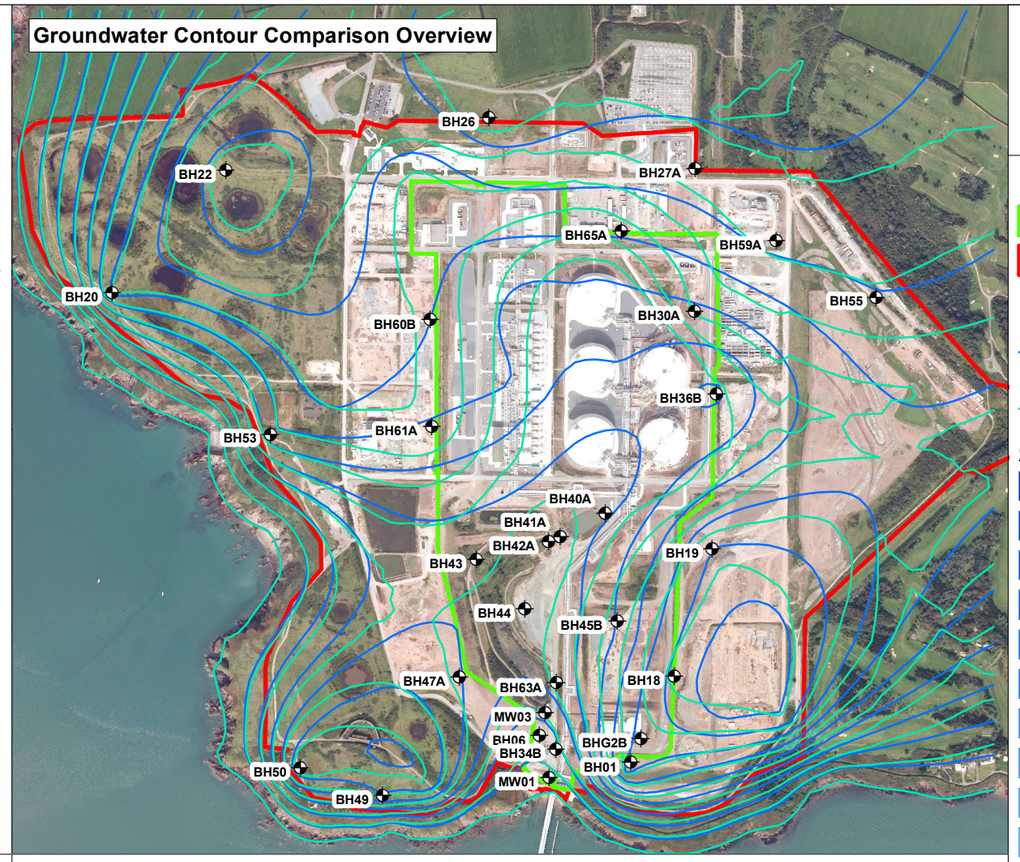
Groundwater Levels ï Contour Plots

LiDAR Digital Elevation Model (June 2011) & Recent Site Photograph





Groundwater Contour Comparison Overview



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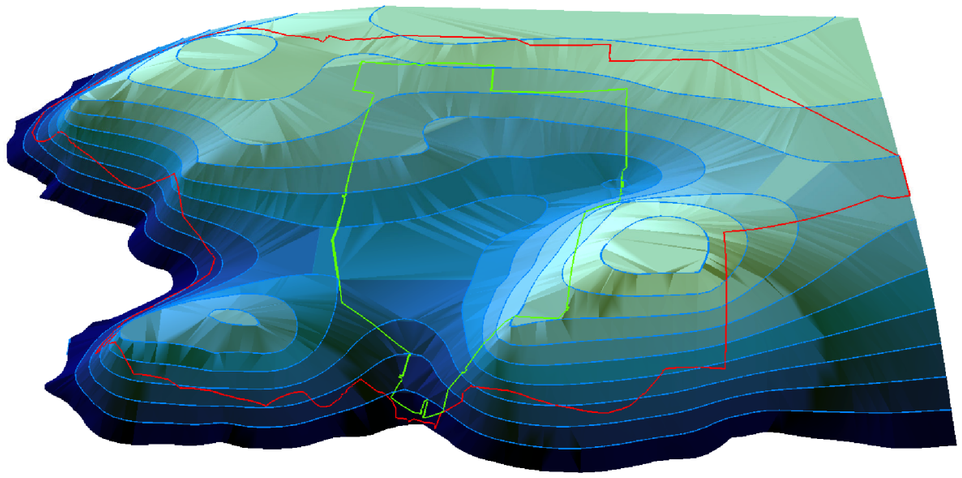
- Green Fence Line
- Site Boundary
- Monitoring Well Location
- Pre-Construction Groundwater Contours (14 January 2004)
- Post-Construction Groundwater Contours (1 January 2006)

Groundwater Levels (maOD)

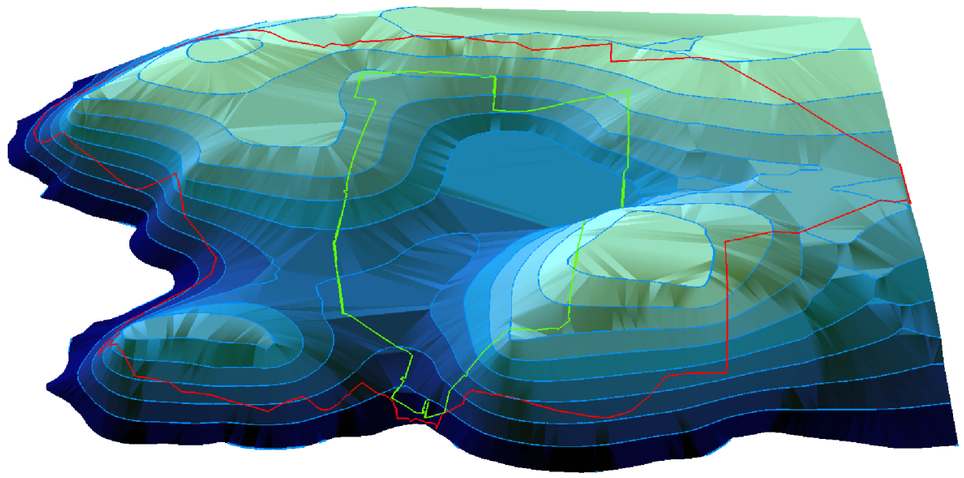
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- 31 -< 35
- 36 -< 40
- 41 -< 45
- > 45

NOTE
All groundwater contours generated in Surfer 11, with all assumptions outlined in Groundwater Monitoring Review and Trend Analysis (RPS, 2013)

Pre-Construction Groundwater Contours (14 January 2004)



Post-Construction Groundwater Contours (1 January 2006)



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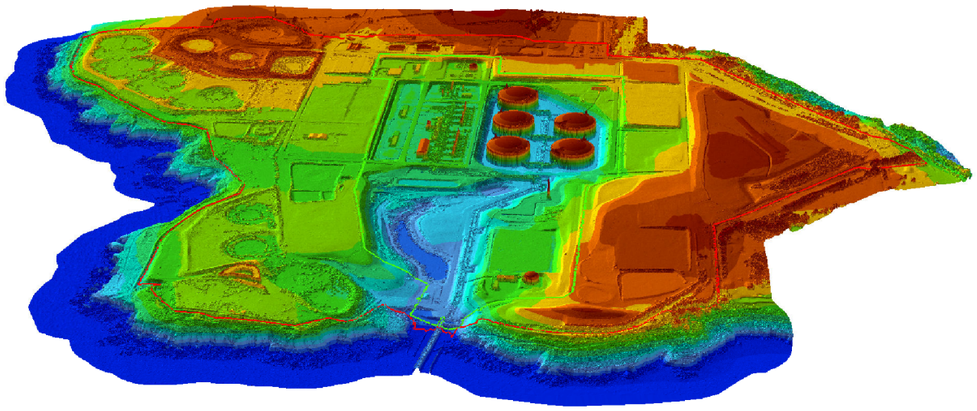
Client	SOUTH HOOK LNG
Project	MONITORING PROGRAMME
Title	GROUNDWATER CONTOURS (2004 & 2006)

Status	Drawn By	PM/Checked By
PRELIMINARY	RJ	AG
Job Ref	**Scale @ A3**	**Date Created**
JER5575U	1:12,500	AUG 13

Drawing Number: **JER5575U-002i** Rev: **-**

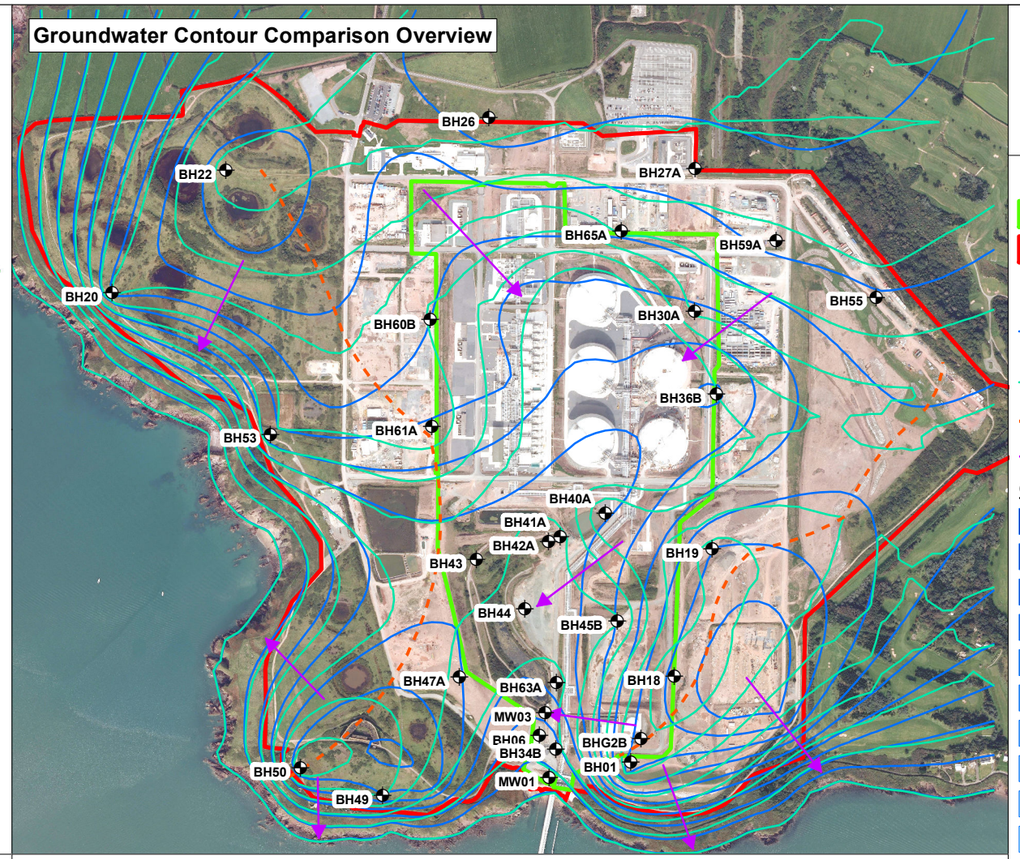
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LiDAR Digital Elevation Model (June 2011) & Recent Site Photograph





Groundwater Contour Comparison Overview



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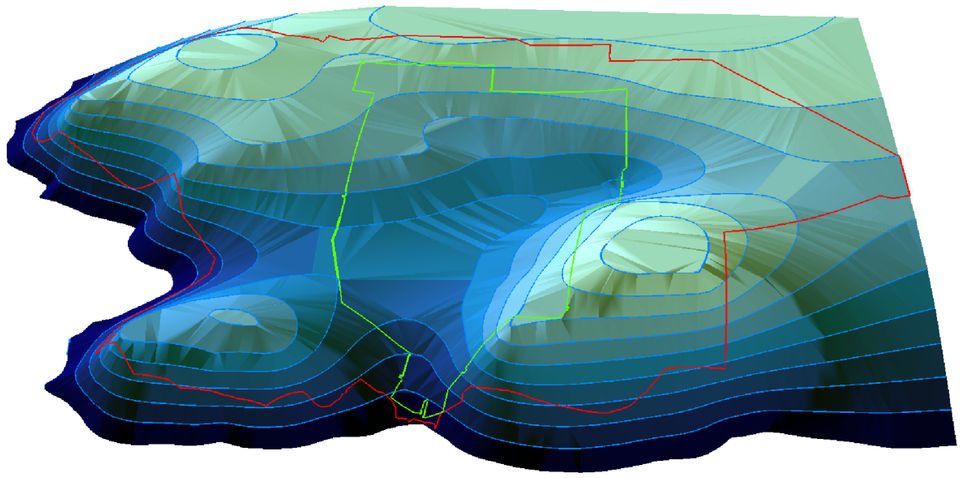
- Green Fence Line
- Site Boundary
- Monitoring Well Location
- Pre-Construction Groundwater Contours (14 January 2004)
- Recent Groundwater Minimum Contours (30 June 2011)
- Groundwater Divide
- Schematic Groundwater Flow Direction

Groundwater Levels (maOD)

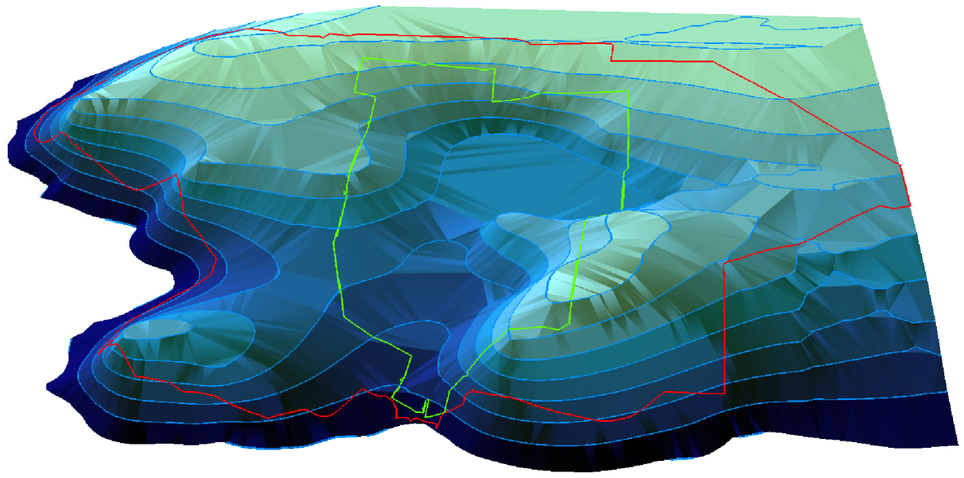
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- 31 -< 35
- 36 -< 40
- 41 -< 45
- > 45

NOTE
All groundwater contours generated in Surfer 11, with all assumptions outlined in Groundwater Monitoring Review and Trend Analysis (RPS, 2013)

Pre-Construction Groundwater Contours (14 January 2004)



Recent Groundwater Minimum Contours (30 June 2011)



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Client: SOUTH HOOK LNG

Project: MONITORING PROGRAMME

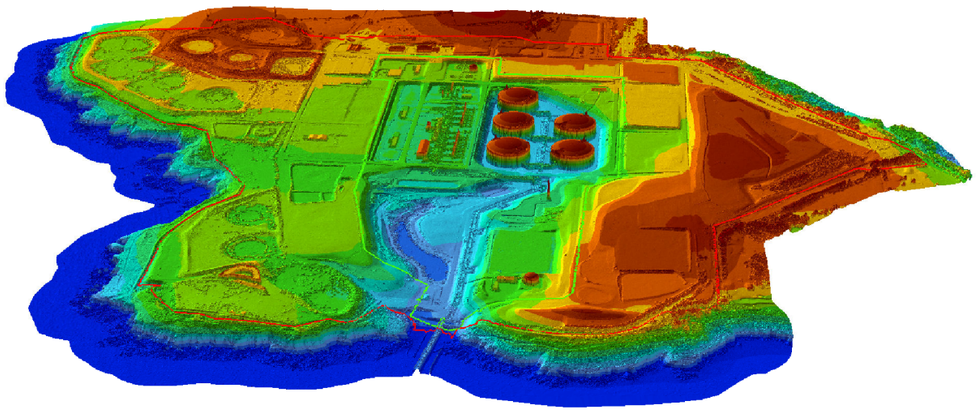
Title: GROUNDWATER CONTOURS (2004 & 2011)

Status	Drawn By	PM/Checked By
PRELIMINARY	RJ	AG
Job Ref	**Scale @ A3**	**Date Created**
JER5575U	1:12,500	AUG 13

Drawing Number: **JER5575U-002ii** Rev: **-**

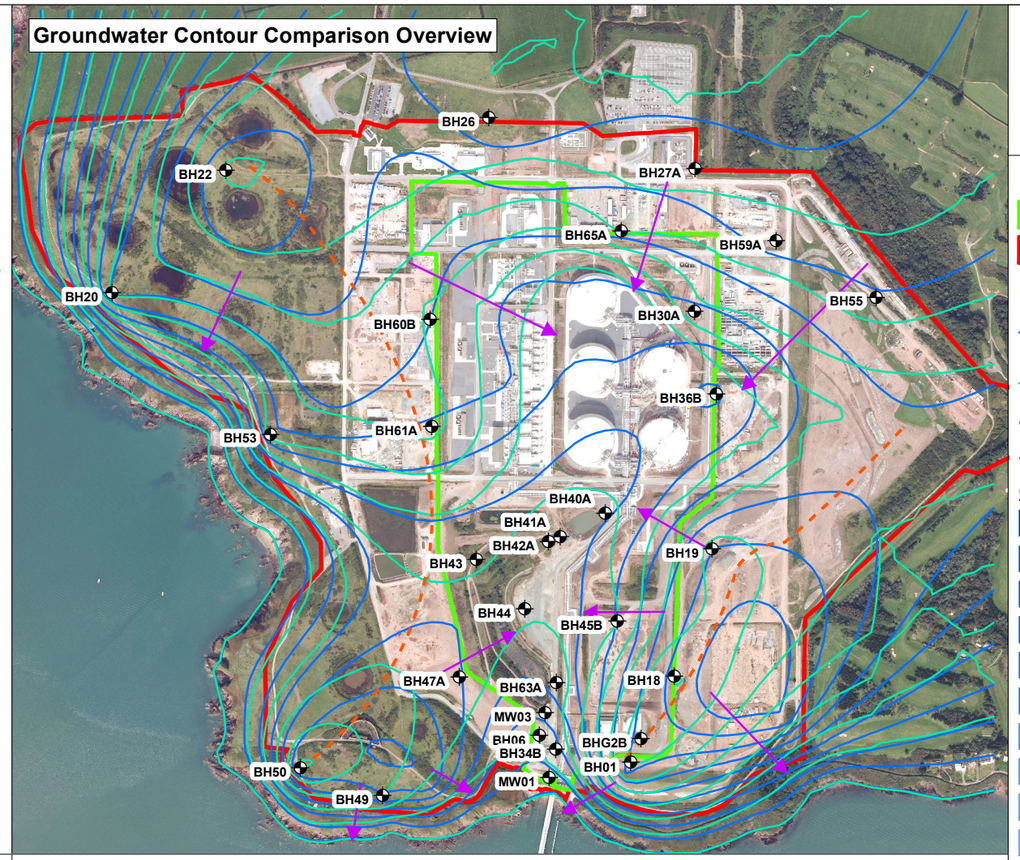
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Groundwater Contour Comparison Overview



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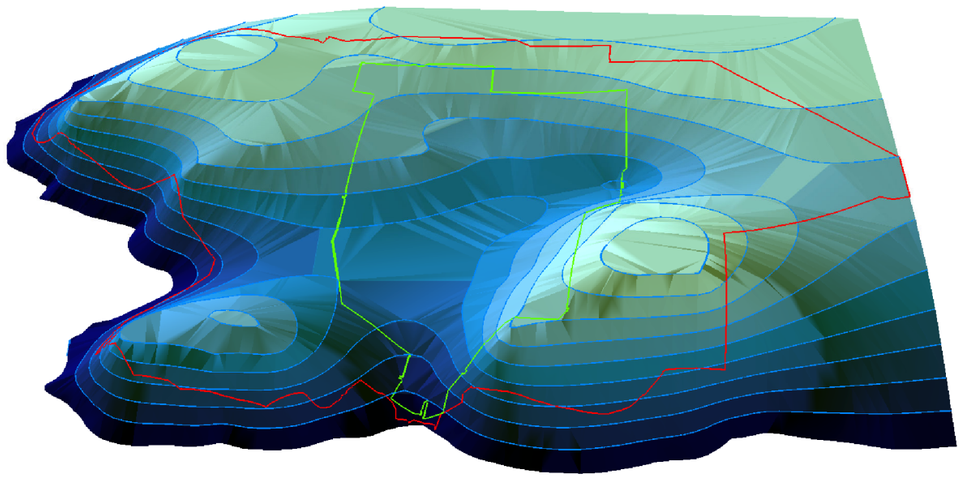
- Green Fence Line
- Site Boundary
- Monitoring Well Location
- Pre-Construction Groundwater Contours (14 January 2004)
- Recent Groundwater Maximum Contours (30 January 2012)
- Groundwater Divide
- Schematic Groundwater Flow Direction

Groundwater Levels (maOD)

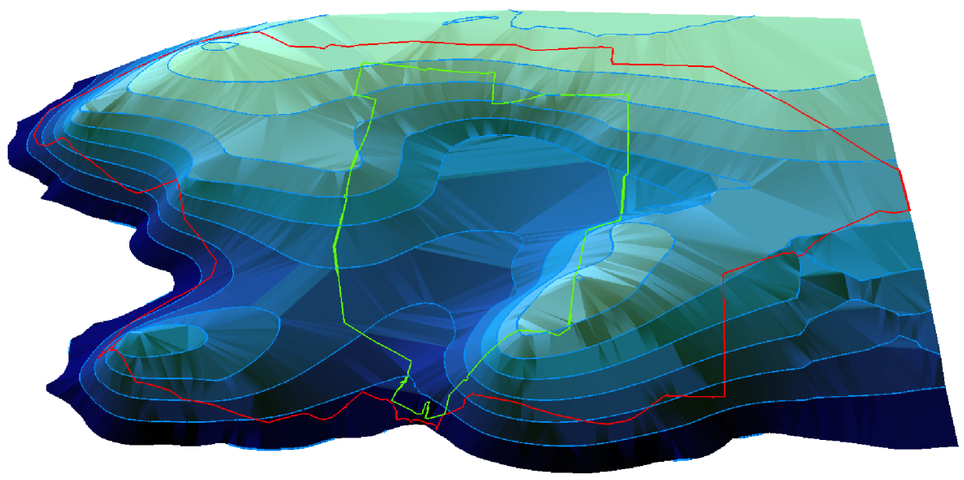
- < 5
- 6 -< 10
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- 21 -< 25
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- 31 -< 35
- 36 -< 40
- 41 -< 45
- > 45

NOTE
All groundwater contours generated in Surfer 11, with all assumptions outlined in Groundwater Monitoring Review and Trend Analysis (RPS, 2013)

Pre-Construction Groundwater Contours (14 January 2004)



Recent Groundwater Maximum Contours (30 January 2012)



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Client	SOUTH HOOK LNG
Project	MONITORING PROGRAMME
Title	GROUNDWATER CONTOURS (2004 & 2012)

Status	Drawn By	PM/Checked By
PRELIMINARY	RJ	AG
Job Ref	**Scale @ A3**	**Date Created**
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Drawing Number: **JER5575U-002iii** Rev: **-**

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Appendix 6

Groundwater Quality ï Dataset Summary Tables

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH34B	2004	0	0		
BH34B	2005	8	0	None > LOD	None > LOD
BH34B	2006	12	0	None > LOD	None > LOD
BH34B	2007	5	0	None > LOD	None > LOD
BH34B	2008	10	1	48	8
BH34B	2009	11	2	48	8.6
BH34B	2010	12	1	1800.0	150.0
BH34B	2011	12	3	20	5
BH34B	2012	12	4	19.3	6.4
BH34B	2013	3	2	16.5	11.0

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH34B	2004	0	0		
BH34B	2005	8	1	100	13
BH34B	2006	12	0	None > LOD	None > LOD
BH34B	2007	5	0	None > LOD	None > LOD
BH34B	2008	10	10	1276	1276
BH34B	2009	11	11	1355	1355.5
BH34B	2010	12	10	327.0	272.5
BH34B	2011	12	11	566	519
BH34B	2012	12	12	178.6	178.6
BH34B	2013	3	3	251.3	251.3

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH41A	2004	0	0		
BH41A	2005	5	0	None > LOD	None > LOD
BH41A	2006	13	6	3228	1490
BH41A	2007	12	8	5218	3479
BH41A	2008	12	5	140	58
BH41A	2009	11	5	205	93.0
BH41A	2010	12	1	61.0	5.1
BH41A	2011	12	3	26	7
BH41A	2012	12	8	19.6	13.1
BH41A	2013	3	2	17.0	11.3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH41A	2004	0	0		
BH41A	2005	5	4	2950	2360
BH41A	2006	13	10	14410	11085
BH41A	2007	12	11	20909	19167
BH41A	2008	12	12	17267	17267
BH41A	2009	11	10	6299	5726
BH41A	2010	12	9	624	468
BH41A	2011	12	10	3646	3039
BH41A	2012	12	12	2193	2193
BH41A	2013	3	3	1728.0	1728.0

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH42A	2004	0	0		
BH42A	2005	1	1	1800	1800
BH42A	2006	2	0	None > LOD	None > LOD
BH42A	2007	1	1	780	780
BH42A	2008	6	5	2144	1787
BH42A	2009	11	10	71612	71612.1
BH42A	2010	12	9	333.7	250.3
BH42A	2011	12	12	487	487
BH42A	2012	6	6	134.3	134.3
BH42A	2013	3	3	60.7	60.7

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH42A	2004	0	0		
BH42A	2005	1	1	2500	2500
BH42A	2006	2	2	200	200
BH42A	2007	1	1	13000	13000
BH42A	2008	6	6	58267	58267
BH42A	2009	10	10	142230	142230
BH42A	2010	12	12	21508	21508
BH42A	2011	12	12	52968	52968
BH42A	2012	6	6	18411	18411
BH42A	2013	3	3	28300.0	28300.0

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH43	2004	1	1	570	570
BH43	2005	12	4	378	126
BH43	2006	12	4	366	122
BH43	2007	12	7	176	103
BH43	2008	12	10	205	171
BH43	2009	12	7	104	60.6
BH43	2010	12	10	72	60.1
BH43	2011	12	9	153	115
BH43	2012	11	11	48.3	48.3
BH43	2013	3	2	47.5	31.7

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH43	2004	0	0	No Analyses	No Analyses
BH43	2005	12	6	700	350
BH43	2006	12	8	713	475
BH43	2007	12	8	1113	742
BH43	2008	12	10	740	617
BH43	2009	12	8	929	619
BH43	2010	12	10	1326	1105
BH43	2011	12	12	548	548
BH43	2012	11	11	287	287
BH43	2013	3	3	332.7	332.7

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH06	2004	0	0		
BH06	2005	10	1	14	1
BH06	2006	12	0	None > LOD	None > LOD
BH06	2007	12	0	None > LOD	None > LOD
BH06	2008	11	0	None > LOD	None > LOD
BH06	2009	12	2	45	7.5
BH06	2010	4	0	None > LOD	None > LOD
BH06	2011	3	0	None > LOD	None > LOD
BH06	2012	5	2	10.0	4.0
BH06	2013	1	0	None > LOD	None > LOD

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH06	2004	0	0		
BH06	2005	10	3	500	150
BH06	2006	12	2	100	17
BH06	2007	12	0	None > LOD	None > LOD
BH06	2008	11	3	200	55
BH06	2009	12	1	320	27
BH06	2010	4	1	190	48
BH06	2011	3	3	55	55
BH06	2012	5	5	55	55
BH06	2013	1	1	77.8	77.8

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH44	2004	1	0	None > LOD	None > LOD
BH44	2005	9	2	65	14
BH44	2006	12	2	50	8
BH44	2007	12	0	None > LOD	None > LOD
BH44	2008	12	0	None > LOD	None > LOD
BH44	2009	12	0	None > LOD	None > LOD
BH44	2010	4	0	None > LOD	None > LOD
BH44	2011	3	0	None > LOD	None > LOD
BH44	2012	5	2	10.0	4.0
BH44	2013	1	0	None > LOD	None > LOD

Location	Year	Total Diesel Range Organics (DRO)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH44	2004	0	0	No Analyses	No Analyses
BH44	2005	9	0	None > LOD	None > LOD
BH44	2006	12	0	None > LOD	None > LOD
BH44	2007	12	1	300	25
BH44	2008	12	0	None > LOD	None > LOD
BH44	2009	12	2	145	24.2
BH44	2010	4	1	230.0	57.5
BH44	2011	3	0	None > LOD	None > LOD
BH44	2012	5	2	10.0	4.0
BH44	2013	1	1	52.0	52.0

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
MW01	2004	0			
MW01	2005	0			
MW01	2006	0			
MW01	2007	0			
MW01	2008	0			
MW01	2009	1	1	1380	1380.0
MW01	2010	2	0	None > LOD	None > LOD
MW01	2011	2	0	None > LOD	None > LOD
MW01	2012	5	2	10.0	4.0

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
MW01	2004	0			
MW01	2005	0			
MW01	2006	0			
MW01	2007	0			
MW01	2008	0			
MW01	2009	1	0	None > LOD	None > LOD
MW01	2010	2	0	None > LOD	None > LOD
MW01	2011	2	1	33	16
MW01	2012	5	3	14.7	8.8

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
MW03	2004	0			
MW03	2005	0			
MW03	2006	0			
MW03	2007	0			
MW03	2008	0			
MW03	2009	0			
MW03	2010	0			
MW03	2011	2	0	None > LOD	None > LOD
MW03	2012	4	1	10.0	4.0

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
MW03	2004	0			
MW03	2005	0			
MW03	2006	0			
MW03	2007	0			
MW03	2008	0			
MW03	2009	0			
MW03	2010	0			
MW03	2011	2	2	134	134
MW03	2012	4	4	103.6	103.6

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH30A	2004	0			
BH30A	2005	6	2	2757	919
BH30A	2006	12	0	None > LOD	None > LOD
BH30A	2007	10	1	13	1
BH30A	2008	11	0	None > LOD	None > LOD
BH30A	2009	11	1	34	3.1
BH30A	2010	1	0	None > LOD	None > LOD
BH30A	2011	2	0	None > LOD	None > LOD
BH30A	2012	3	1	10.0	3.3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH30A	2004	0			
BH30A	2005	6	1	200	33
BH30A	2006	12	0	None > LOD	None > LOD
BH30A	2007	10	0	None > LOD	None > LOD
BH30A	2008	11	0	None > LOD	None > LOD
BH30A	2009	11	1	500	45.5
BH30A	2010	1	0	None > LOD	None > LOD
BH30A	2011	2	0	None > LOD	None > LOD
BH30A	2012	3	1	10.0	3.3

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH40A	2004	0			
BH40A	2005	1	0	None > LOD	None > LOD
BH40A	2006	10	1	740	74
BH40A	2007	12	0	None > LOD	None > LOD
BH40A	2008	11	0	None > LOD	None > LOD
BH40A	2009	12	1	33	2.8
BH40A	2010	1	0	None > LOD	None > LOD
BH40A	2011	2	0	None > LOD	None > LOD
BH40A	2012	3	1	10.0	3.3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH40A	2004	0			
BH40A	2005	1	0	None > LOD	None > LOD
BH40A	2006	10	0	None > LOD	None > LOD
BH40A	2007	12	0	None > LOD	None > LOD
BH40A	2008	11	0	None > LOD	None > LOD
BH40A	2009	12	3	283	70.8
BH40A	2010	1	0	None > LOD	None > LOD
BH40A	2011	2	0	None > LOD	None > LOD
BH40A	2012	3	3	2197.0	2197.0

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH45A	2004	0			
BH45A	2005	0			
BH45A	2006	10	0	None > LOD	None > LOD
BH45A	2007	6	0	None > LOD	None > LOD
BH45A	2008	10	0	None > LOD	None > LOD
BH45A	2009	10	1	38	3.8
BH45A	2010	1	0	None > LOD	None > LOD
BH45A	2011	2	0	None > LOD	None > LOD
BH45A	2012	3	1	10.0	3.3

Location	Year	Total Diesel Range Organics (DRO)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH45A	2004	0			
BH45A	2005	0			
BH45A	2006	10	0	None > LOD	None > LOD
BH45A	2007	6	0	None > LOD	None > LOD
BH45A	2008	10	3	133	40
BH45A	2009	10	0	None > LOD	None > LOD
BH45A	2010	1	0	None > LOD	None > LOD
BH45A	2011	2	0	None > LOD	None > LOD
BH45A	2012	3	3	108.3	108.3

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH63A	2004	0			
BH63A	2005	0			
BH63A	2006	10	0	None > LOD	None > LOD
BH63A	2007	11	0	None > LOD	None > LOD
BH63A	2008	11	0	None > LOD	None > LOD
BH63A	2009	12	1	53	4.4
BH63A	2010	1	0	None > LOD	None > LOD
BH63A	2011	2	0	None > LOD	None > LOD
BH63A	2012	3	1	10.0	3.3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH63A	2004	0			
BH63A	2005	0			
BH63A	2006	10	0	None > LOD	None > LOD
BH63A	2007	11	0	None > LOD	None > LOD
BH63A	2008	11	0	None > LOD	None > LOD
BH63A	2009	12	0	None > LOD	None > LOD
BH63A	2010	1	0	None > LOD	None > LOD
BH63A	2011	2	0	None > LOD	None > LOD
BH63A	2012	3	1	10.0	3.3

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BHG2	2004	0			
BHG2	2005	2	0	None > LOD	None > LOD
BHG2	2006	10	4	227	91
BHG2	2007	12	0	None > LOD	None > LOD
BHG2	2008	11	1	73	7
BHG2	2009	11	1	44	4.0
BHG2	2010	1	0	None > LOD	None > LOD
BHG2	2011	2	0	None > LOD	None > LOD
BHG2	2012	3	1	10.0	3.3
BHG2	2013				

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BHG2	2004	0			
BHG2	2005	2	2	1700	1700
BHG2	2006	10	10	380	380
BHG2	2007	12	7	200	117
BHG2	2008	11	3	100	27
BHG2	2009	11	2	160	29.1
BHG2	2010	1	0	None > LOD	None > LOD
BHG2	2011	2	1	13	6
BHG2	2012	3	1	42.9	14.3
BHG2	2013				

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH50	2004	1	1	500	500
BH50	2005	6	5	1936	1613
BH50	2006	4	3	3600	2700
BH50	2007	4	4	1721	1721
BH50	2008	4	4	1035	1035
BH50	2009	3	3	1510	1510
BH50	2010	4	4	995	995
BH50	2011	3	3	1275	1275
BH50	2012	5	4	1885	1508
BH50	2013	1	1	92	92

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH50	2004	0	0	No Analyses	No Analyses
BH50	2005	6	4	1275	850
BH50	2006	4	4	2600	2600
BH50	2007	4	3	3067	2300
BH50	2008	4	4	1775	1775
BH50	2009	3	2	1300	867
BH50	2010	4	4	1215	1215
BH50	2011	3	3	1064	1064
BH50	2012	5	5	1863	1863
BH50	2013	1	1	345	345

Location	Year	Total Gasoline Range Organics (GRO)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH01	2004	0			
BH01	2005	0			
BH01	2006	0			
BH01	2007	0			
BH01	2008	0			
BH01	2009	0			
BH01	2010	0			
BH01	2011	0			
BH01	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH01	2004	0			
BH01	2005	0			
BH01	2006	0			
BH01	2007	0			
BH01	2008	0			
BH01	2009	0			
BH01	2010	0			
BH01	2011	0			
BH01	2012	3	2	73	48

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH18	2004	0			
BH18	2005	11	1	14	1
BH18	2006	12	0	None > LOD	None > LOD
BH18	2007	11	0	None > LOD	None > LOD
BH18	2008	11	0	None > LOD	None > LOD
BH18	2009	12	1	39	3
BH18	2010	1	0	None > LOD	None > LOD
BH18	2011	2	0	None > LOD	None > LOD
BH18	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH18	2004	0			
BH18	2005	11	1	100	9
BH18	2006	12	3	133	33
BH18	2007	11	0	None > LOD	None > LOD
BH18	2008	11	1	200	18
BH18	2009	12	2	140	23
BH18	2010	1	0	None > LOD	None > LOD
BH18	2011	2	1	47	24
BH18	2012	3	3	126	126

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH19	2004	0			
BH19	2005	11	1	35	3
BH19	2006	12	0	None > LOD	None > LOD
BH19	2007	11	0	None > LOD	None > LOD
BH19	2008	11	0	None > LOD	None > LOD
BH19	2009	12	2	33	5
BH19	2010	1	0	None > LOD	None > LOD
BH19	2011	2	0	None > LOD	None > LOD
BH19	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH19	2004	0			
BH19	2005	11	1	200	18
BH19	2006	12	0	None > LOD	None > LOD
BH19	2007	11	1	200	18
BH19	2008	11	2	300	55
BH19	2009	12	1	150	13
BH19	2010	1	0	None > LOD	None > LOD
BH19	2011	2	0	None > LOD	None > LOD
BH19	2012	3	2	52	35

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH20	2004	1	0	None > LOD	None > LOD
BH20	2005	6	0	None > LOD	None > LOD
BH20	2006	4	0	None > LOD	None > LOD
BH20	2007	4	0	None > LOD	None > LOD
BH20	2008	4	0	None > LOD	None > LOD
BH20	2009	4	2	133	67
BH20	2010	1	0	None > LOD	None > LOD
BH20	2011	2	0	None > LOD	None > LOD
BH20	2012	3	2	16	10

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH20	2004	0	0	No Analyses	No Analyses
BH20	2005	6	2	300	100
BH20	2006	4	0	None > LOD	None > LOD
BH20	2007	4	0	None > LOD	None > LOD
BH20	2008	4	0	None > LOD	None > LOD
BH20	2009	4	0	None > LOD	None > LOD
BH20	2010	1	0	None > LOD	None > LOD
BH20	2011	2	0	None > LOD	None > LOD
BH20	2012	3	2	296	197

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH22	2004	0			
BH22	2005	6	0	None > LOD	None > LOD
BH22	2006	4	0	None > LOD	None > LOD
BH22	2007	4	0	None > LOD	None > LOD
BH22	2008	4	0	None > LOD	None > LOD
BH22	2009	4	2	39	19
BH22	2010	1	0	None > LOD	None > LOD
BH22	2011	2	0	None > LOD	None > LOD
BH22	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH22	2004	0			
BH22	2005	6	2	200	67
BH22	2006	4	0	None > LOD	None > LOD
BH22	2007	4	0	None > LOD	None > LOD
BH22	2008	4	0	None > LOD	None > LOD
BH22	2009	4	0	None > LOD	None > LOD
BH22	2010	1	1	140	140
BH22	2011	2	0	None > LOD	None > LOD
BH22	2012	3	2	167	111

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH26	2004	0			
BH26	2005	6	0	None > LOD	None > LOD
BH26	2006	4	0	None > LOD	None > LOD
BH26	2007	4	0	None > LOD	None > LOD
BH26	2008	4	0	None > LOD	None > LOD
BH26	2009	4	2	44	22
BH26	2010	1	0	None > LOD	None > LOD
BH26	2011	2	0	None > LOD	None > LOD
BH26	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH26	2004	0			
BH26	2005	6	0	None > LOD	None > LOD
BH26	2006	4	0	None > LOD	None > LOD
BH26	2007	4	0	None > LOD	None > LOD
BH26	2008	4	0	None > LOD	None > LOD
BH26	2009	4	1	110	28
BH26	2010	1	0	None > LOD	None > LOD
BH26	2011	2	0	None > LOD	None > LOD
BH26	2012	3	2	111	74

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH27A	2004	0			
BH27A	2005	8	1	14	2
BH27A	2006	12	0	None > LOD	None > LOD
BH27A	2007	11	0	None > LOD	None > LOD
BH27A	2008	11	0	None > LOD	None > LOD
BH27A	2009	12	1	36	3
BH27A	2010	1	0	None > LOD	None > LOD
BH27A	2011	2	0	None > LOD	None > LOD
BH27A	2012	3	2	11	7

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH27A	2004	0			
BH27A	2005	8	2	200	50
BH27A	2006	12	1	700	58
BH27A	2007	11	1	100	9
BH27A	2008	11	0	None > LOD	None > LOD
BH27A	2009	12	1	360	30
BH27A	2010	1	0	None > LOD	None > LOD
BH27A	2011	2	0	None > LOD	None > LOD
BH27A	2012	3	2	118	78

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH36A	2004	0			
BH36A	2005	5	3	853	512
BH36A	2006	12	0	None > LOD	None > LOD
BH36A	2007	5	1	27	5
BH36A	2008	10	0	None > LOD	None > LOD
BH36A	2009	12	2	43	7
BH36A	2010	1	0	None > LOD	None > LOD
BH36A	2011	2	0	None > LOD	None > LOD
BH36A	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH36A	2004	0			
BH36A	2005	5	4	175	140
BH36A	2006	12	2	250	42
BH36A	2007	5	0	None > LOD	None > LOD
BH36A	2008	10	1	3600	360
BH36A	2009	12	2	350	58
BH36A	2010	1	0	None > LOD	None > LOD
BH36A	2011	2	0	None > LOD	None > LOD
BH36A	2012	3	2	144	96

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH47A	2004	0			
BH47A	2005	1	0	None > LOD	None > LOD
BH47A	2006	5	0	None > LOD	None > LOD
BH47A	2007	12	1	570	48
BH47A	2008	12	0	None > LOD	None > LOD
BH47A	2009	11	3	60	16
BH47A	2010	1	0	None > LOD	None > LOD
BH47A	2011	2	0	None > LOD	None > LOD
BH47A	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH47A	2004	0			
BH47A	2005	1	0	None > LOD	None > LOD
BH47A	2006	5	0	None > LOD	None > LOD
BH47A	2007	12	0	None > LOD	None > LOD
BH47A	2008	12	0	None > LOD	None > LOD
BH47A	2009	11	2	330	60
BH47A	2010	1	0	None > LOD	None > LOD
BH47A	2011	2	1	46	23
BH47A	2012	3	3	109	109

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH49	2004	0			
BH49	2005	4	0	None > LOD	None > LOD
BH49	2006	4	0	None > LOD	None > LOD
BH49	2007	4	0	None > LOD	None > LOD
BH49	2008	4	0	None > LOD	None > LOD
BH49	2009	4	1	36	9
BH49	2010	1	0	None > LOD	None > LOD
BH49	2011	2	0	None > LOD	None > LOD
BH49	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH49	2004	0			
BH49	2005	4	2	150	75
BH49	2006	4	2	300	150
BH49	2007	4	0	None > LOD	None > LOD
BH49	2008	4	0	None > LOD	None > LOD
BH49	2009	4	1	110	28
BH49	2010	1	0	None > LOD	None > LOD
BH49	2011	2	0	None > LOD	None > LOD
BH49	2012	3	2	112	75

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH53	2004	1	1	1500	1500
BH53	2005	6	5	918	765
BH53	2006	6	2	405	135
BH53	2007	4	1	240	60
BH53	2008	4	2	265	133
BH53	2009	3	2	221	147
BH53	2010	1	0	None > LOD	None > LOD
BH53	2011	2	0	None > LOD	None > LOD
BH53	2012	3	2	15	10

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH53	2004	0			
BH53	2005	6	0	None > LOD	None > LOD
BH53	2006	6	1	300	50
BH53	2007	4	0	None > LOD	None > LOD
BH53	2008	4	0	None > LOD	None > LOD
BH53	2009	3	0	None > LOD	None > LOD
BH53	2010	1	0	None > LOD	None > LOD
BH53	2011	2	0	None > LOD	None > LOD
BH53	2012	3	2	337	225

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH55	2004	1	0	None > LOD	None > LOD
BH55	2005	6	0	None > LOD	None > LOD
BH55	2006	4	0	None > LOD	None > LOD
BH55	2007	4	0	None > LOD	None > LOD
BH55	2008	4	0	None > LOD	None > LOD
BH55	2009	4	1	35	9
BH55	2010	1	0	None > LOD	None > LOD
BH55	2011	2	0	None > LOD	None > LOD
BH55	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH55	2004	0	0		
BH55	2005	6	2	100	33
BH55	2006	4	0	None > LOD	None > LOD
BH55	2007	4	0	None > LOD	None > LOD
BH55	2008	4	0	None > LOD	None > LOD
BH55	2009	4	0	None > LOD	None > LOD
BH55	2010	1	0	None > LOD	None > LOD
BH55	2011	2	0	None > LOD	None > LOD
BH55	2012	3	2	144	96

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Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH59A	2004	0			
BH59A	2005	2	0	None > LOD	None > LOD
BH59A	2006	4	0	None > LOD	None > LOD
BH59A	2007	4	0	None > LOD	None > LOD
BH59A	2008	4	0	None > LOD	None > LOD
BH59A	2009	4	2	39	10
BH59A	2010	1	0	None > LOD	None > LOD
BH59A	2011	2	0	None > LOD	None > LOD
BH59A	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH59A	2004	0			
BH59A	2005	2	0	None > LOD	None > LOD
BH59A	2006	4	0	None > LOD	None > LOD
BH59A	2007	4	0	None > LOD	None > LOD
BH59A	2008	4	0	None > LOD	None > LOD
BH59A	2009	4	0	None > LOD	None > LOD
BH59A	2010	1	0	None > LOD	None > LOD
BH59A	2011	2	0	None > LOD	None > LOD
BH59A	2012	3	2	97	64

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH60B	2004	0			
BH60B	2005	5	0	None > LOD	None > LOD
BH60B	2006	12	0	None > LOD	None > LOD
BH60B	2007	6	0	None > LOD	None > LOD
BH60B	2008	10	0	None > LOD	None > LOD
BH60B	2009	12	3	41	10
BH60B	2010	1	0	None > LOD	None > LOD
BH60B	2011	2	0	None > LOD	None > LOD
BH60B	2012	3	1	10	3

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH60B	2004	0			
BH60B	2005	5	1	100	20
BH60B	2006	12	0	None > LOD	None > LOD
BH60B	2007	6	0	None > LOD	None > LOD
BH60B	2008	10	2	350	70
BH60B	2009	12	2	155	26
BH60B	2010	1	0	None > LOD	None > LOD
BH60B	2011	2	0	None > LOD	None > LOD
BH60B	2012	3	2	71	47

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH61A	2004	0			
BH61A	2005	5	0	None > LOD	None > LOD
BH61A	2006	12	1	21	2
BH61A	2007	10	0	None > LOD	None > LOD
BH61A	2008	12	5	163	68
BH61A	2009	12	4	228	76
BH61A	2010	1	0	None > LOD	None > LOD
BH61A	2011	2	2	885	885
BH61A	2012	3	3	431	431

Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH61A	2004	0			
BH61A	2005	5	2	750	300
BH61A	2006	12	0	None > LOD	None > LOD
BH61A	2007	10	0	None > LOD	None > LOD
BH61A	2008	12	4	200	67
BH61A	2009	12	5	378	158
BH61A	2010	1	0	None > LOD	None > LOD
BH61A	2011	2	2	456	456
BH61A	2012	3	3	863	863

Appendix 6
Tabulated Groundwater Quality Data

Location	Year	Total Gasoline Range Organics (GRO) (C_5 - C_{10}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH65A	2004	0			
BH65A	2005	0			
BH65A	2006	10	0	None > LOD	None > LOD
BH65A	2007	11	0	None > LOD	None > LOD
BH65A	2008	11	0	None > LOD	None > LOD
BH65A	2009	12	2	39	6
BH65A	2010	1	0	None > LOD	None > LOD
BH65A	2011	2	0	None > LOD	None > LOD
BH65A	2012	3	1	10	3

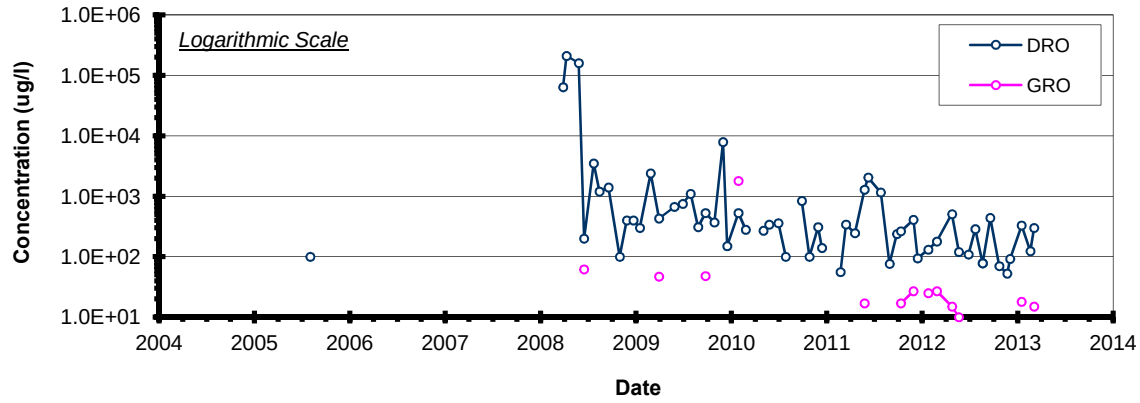
Location	Year	Total Diesel Range Organics (DRO) measured as EPH (C_{10} - C_{40}) (GC-FID)			
		No. Analyses	No. Anlayses above LOD	Mean Conc. (for analyses>LOD) (µg/l)	Mean Conc. (assumes LOD=0) (µg/l)
BH65A	2004	0			
BH65A	2005	0			
BH65A	2006	10	0	None > LOD	None > LOD
BH65A	2007	11	0	None > LOD	None > LOD
BH65A	2008	11	1	600	55
BH65A	2009	12	2	130	22
BH65A	2010	1	0	None > LOD	None > LOD
BH65A	2011	2	0	None > LOD	None > LOD
BH65A	2012	3	2	96	64

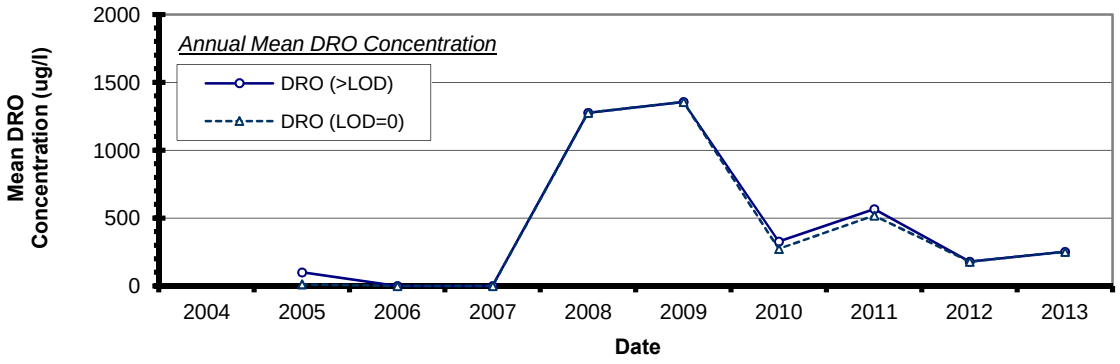
Appendix 7

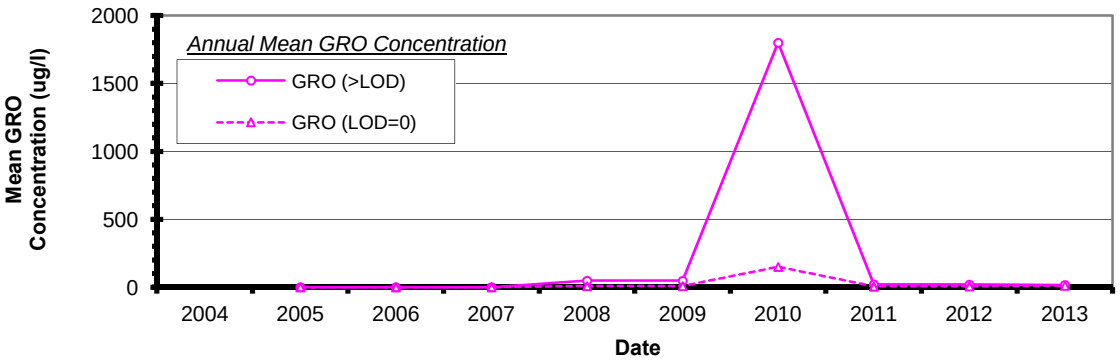
Groundwater Quality ï Time Series Charts

Borehole BH34B
(Inside Green Fence)

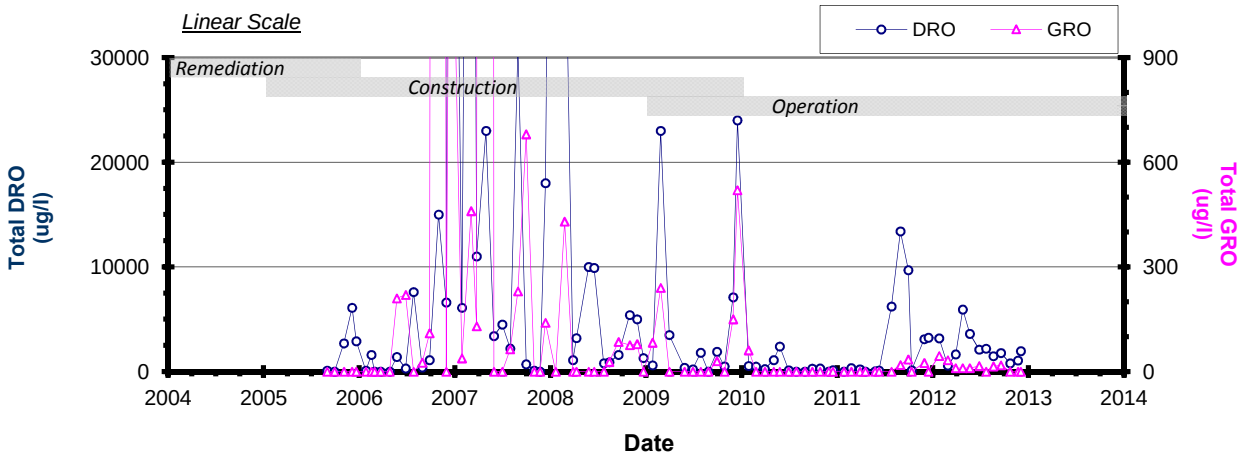


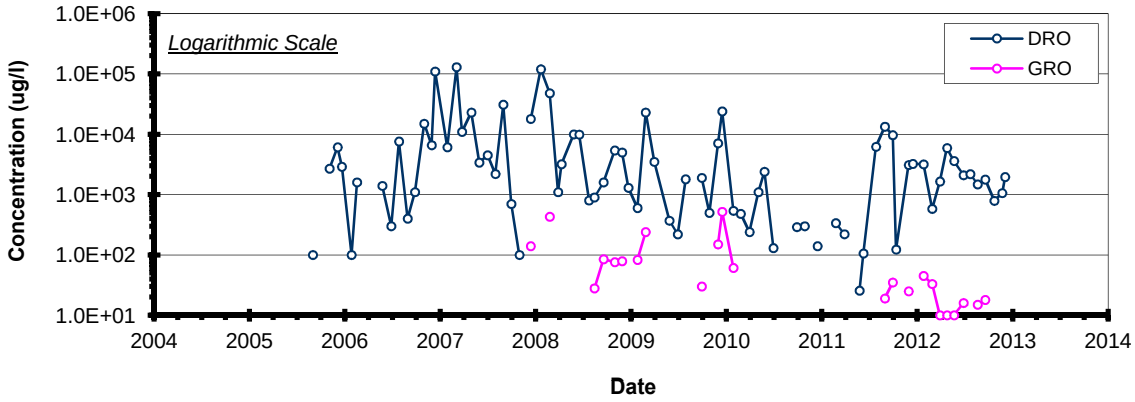


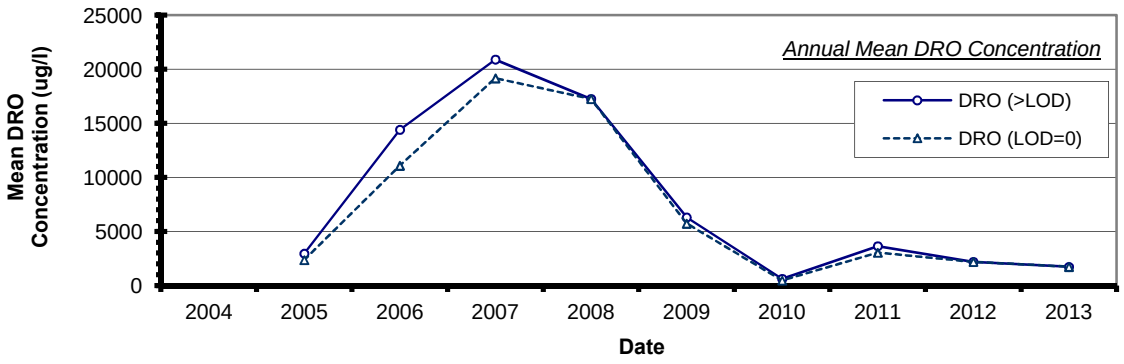




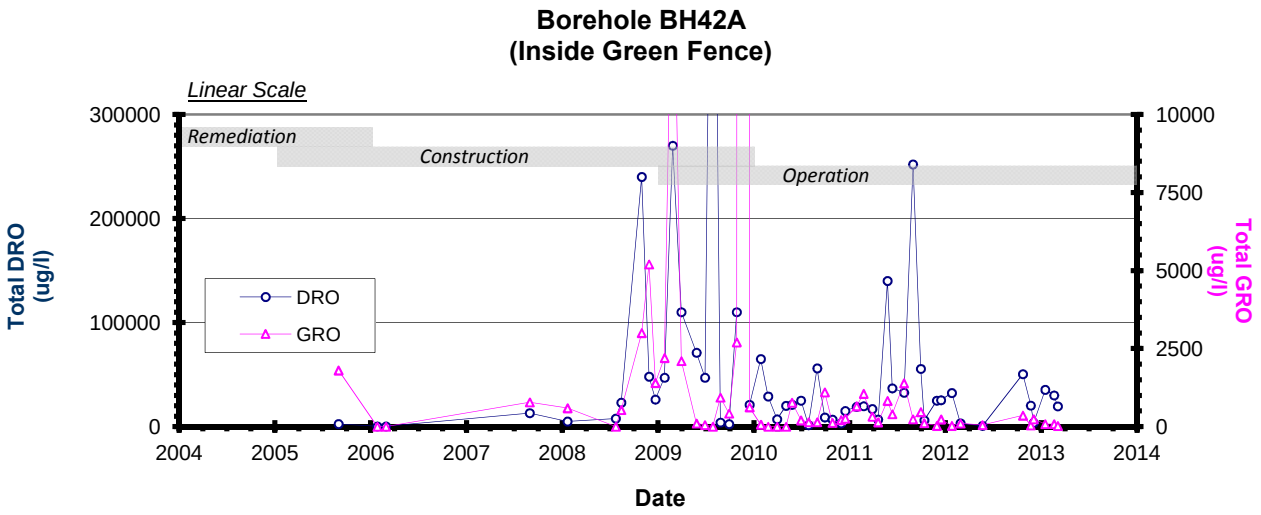
Borehole BH41A
(Inside Green Fence)

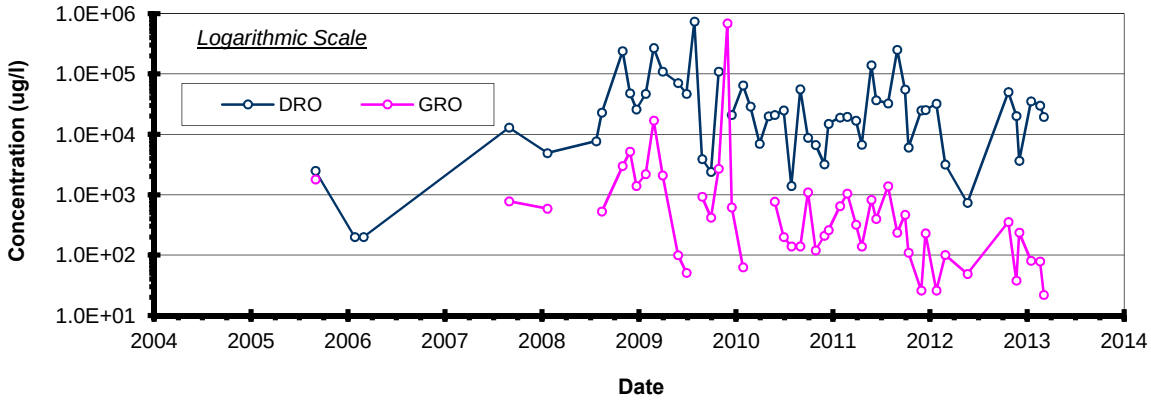


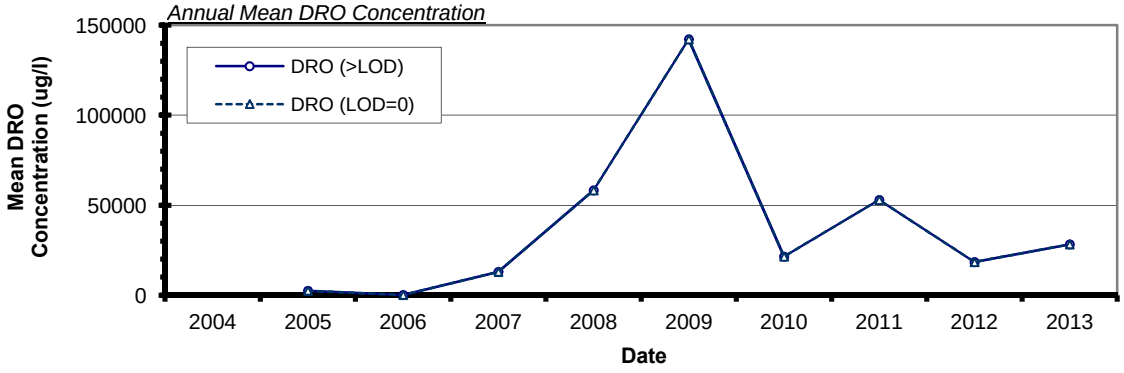


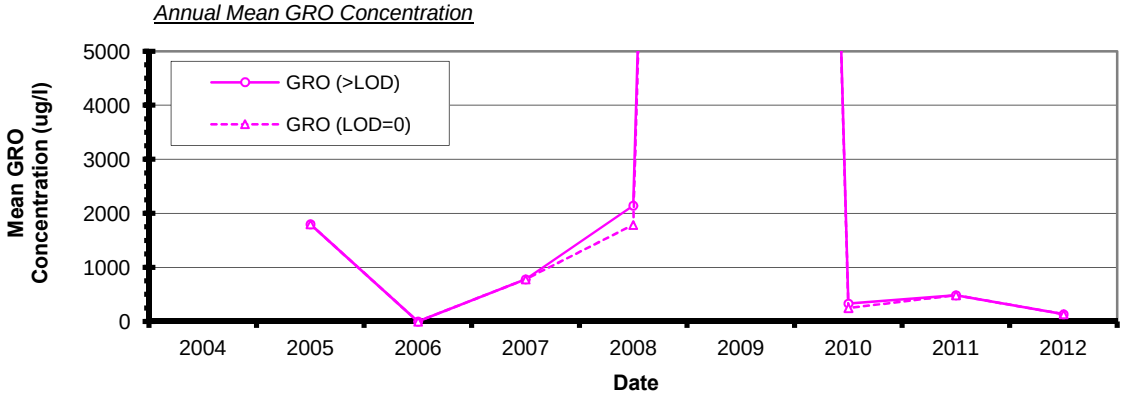


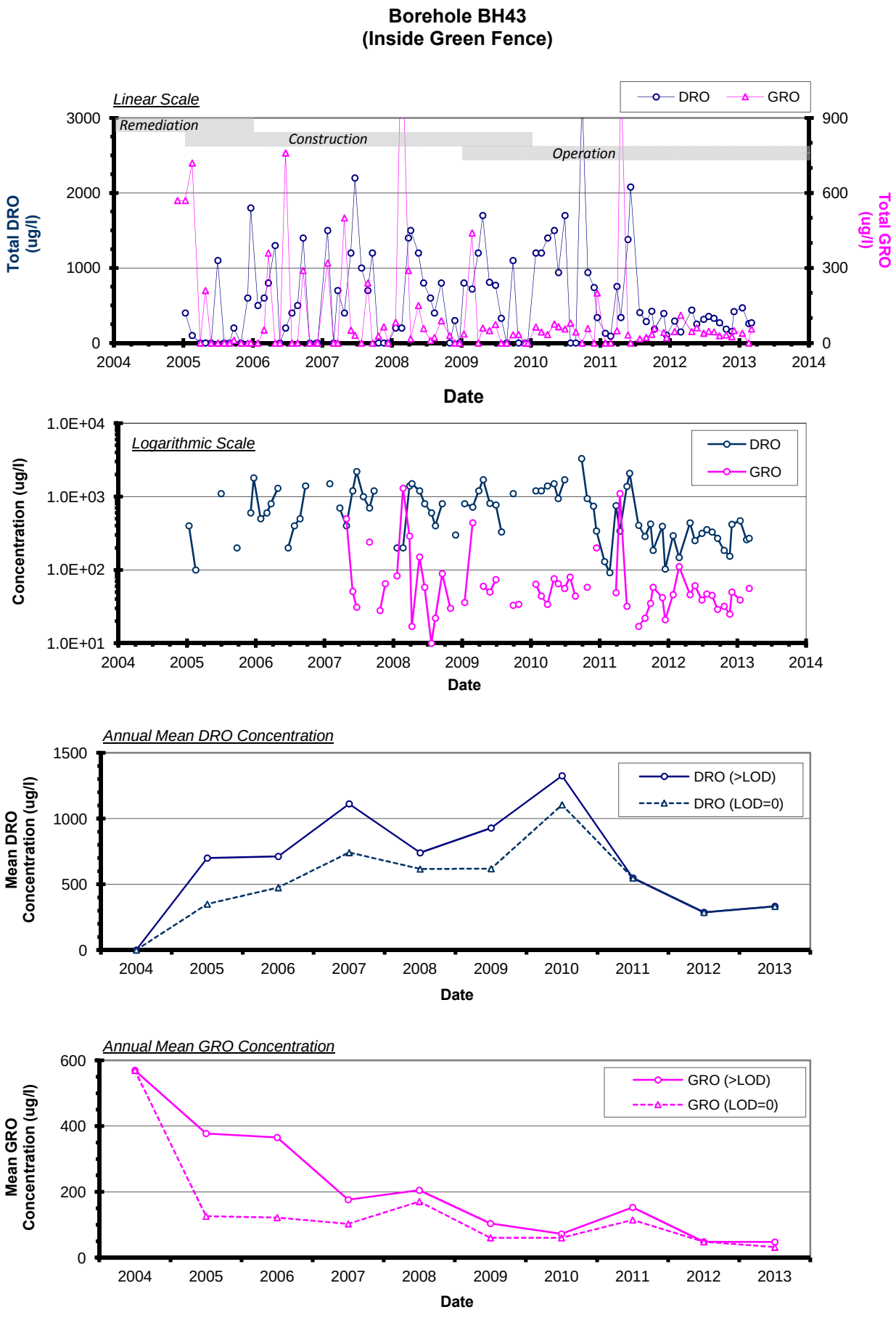


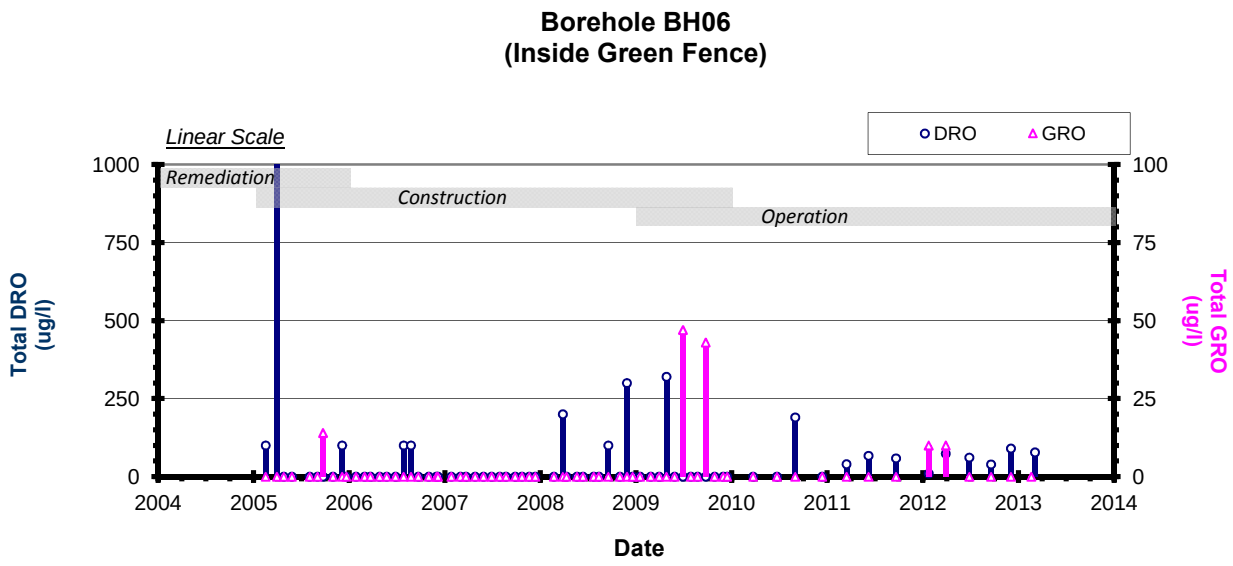

Borehole BH42A
(Inside Green Fence)
Linear Scale
Remediation
Construction
Operation
DRO
GRO
Total DRO (ug/l)
Total GRO (ug/l)
300000
200000
100000
0
10000
7500
5000
2500
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date

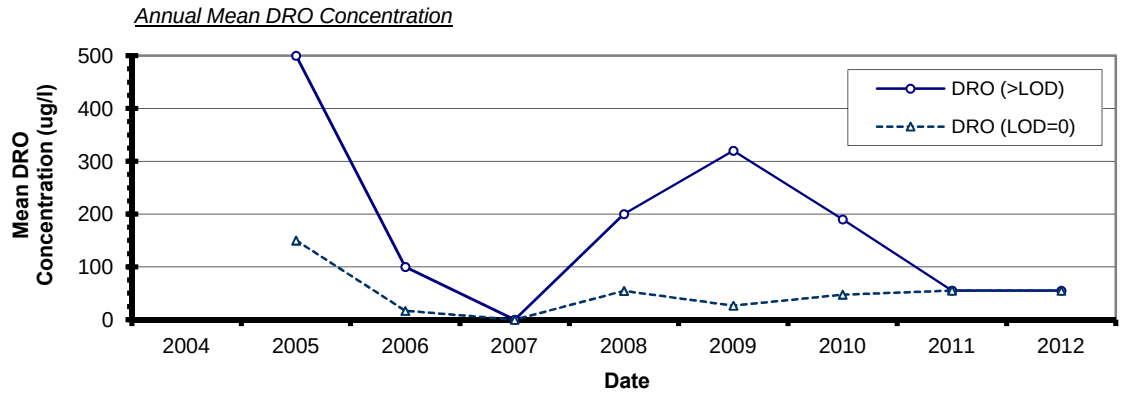

Logarithmic Scale
DRO
GRO
Concentration (ug/l)
1.0E+06
1.0E+05
1.0E+04
1.0E+03
1.0E+02
1.0E+01
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date

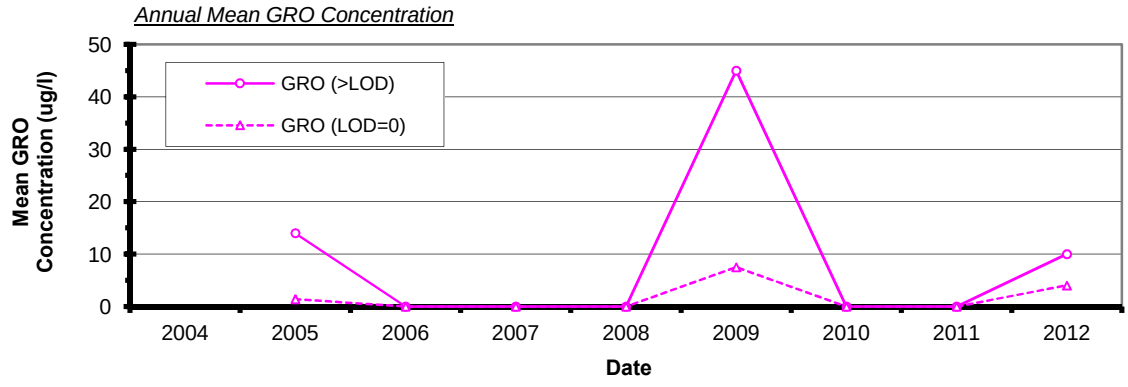

Annual Mean DRO Concentration
DRO (>LOD)
DRO (LOD=0)
Mean DRO Concentration (ug/l)
150000
100000
50000
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Date


Annual Mean GRO Concentration
GRO (>LOD)
GRO (LOD=0)
Mean GRO Concentration (ug/l)
5000
4000
3000
2000
1000
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
Date

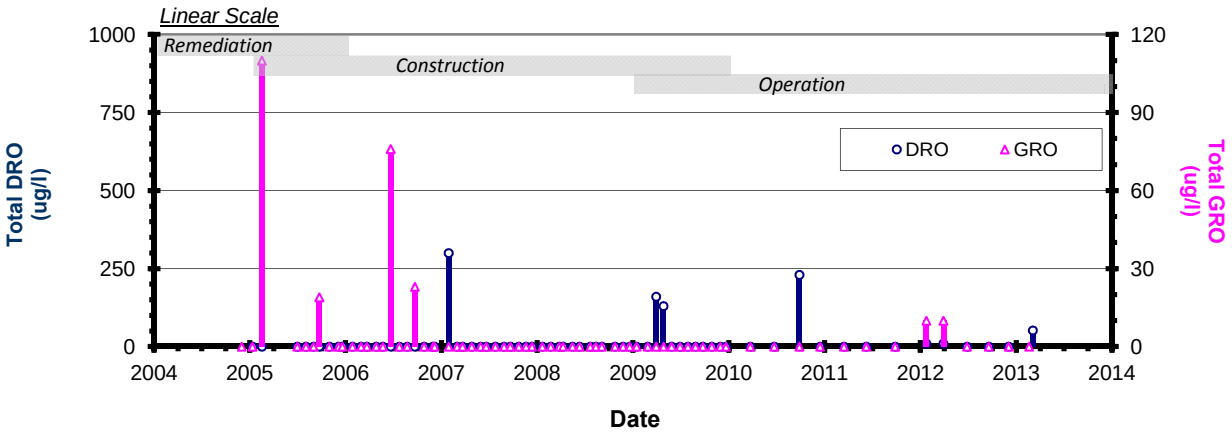

Borehole BH43
(Inside Green Fence)
Linear Scale
DRO
GRO
Remediation
Construction
Operation
Total DRO (ug/l)
Total GRO (ug/l)
3000
2000
1000
0
900
600
300
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date
Logarithmic Scale
Concentration (ug/l)
1.0E+04
1.0E+03
1.0E+02
1.0E+01
Annual Mean DRO Concentration
Mean DRO Concentration (ug/l)
1500
1000
500
0
DRO (>LOD)
DRO (LOD=0)
Annual Mean GRO Concentration
Mean GRO Concentration (ug/l)
600
400
200
0
GRO (>LOD)
GRO (LOD=0)

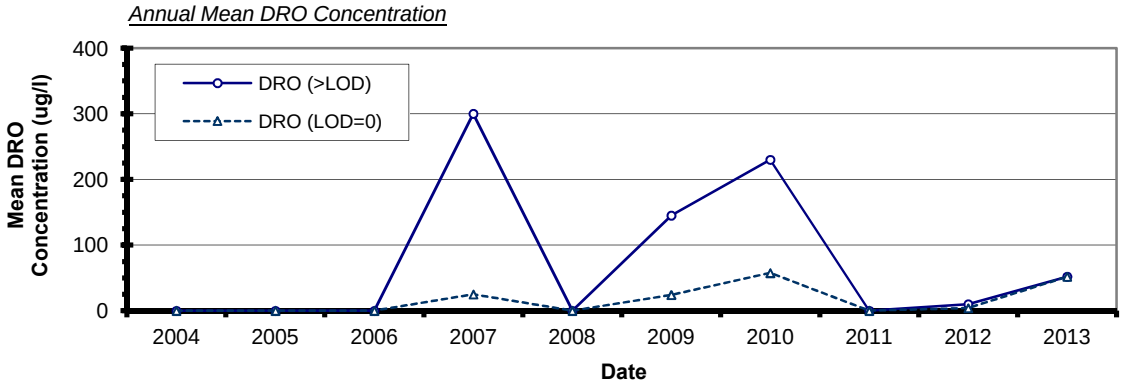

Borehole BH06
(Inside Green Fence)
Linear Scale
DRO
GRO
Remediation
Construction
Operation
Total DRO (ug/l)
Total GRO (ug/l)
1000
750
500
250
0
100
75
50
25
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date

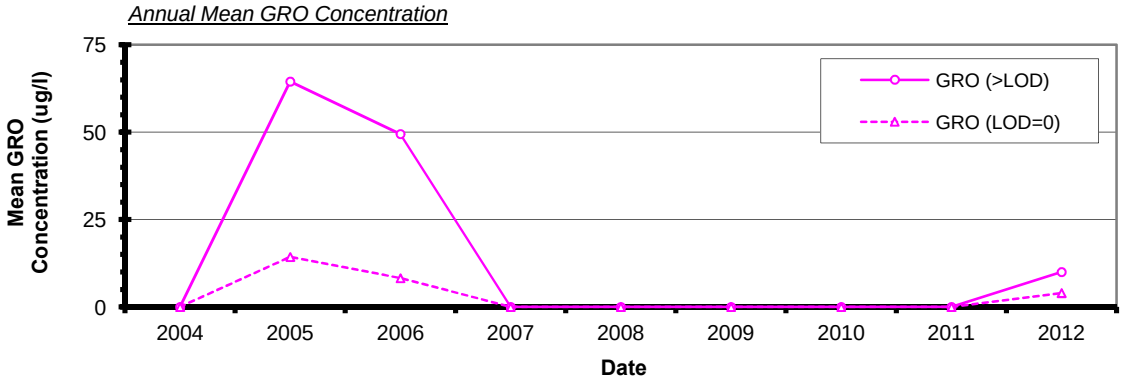

Annual Mean DRO Concentration
Mean DRO Concentration (ug/l)
DRO (>LOD)
DRO (LOD=0)
500
400
300
200
100
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
Date


Annual Mean GRO Concentration
Mean GRO Concentration (ug/l)
GRO (>LOD)
GRO (LOD=0)
50
40
30
20
10
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
Date

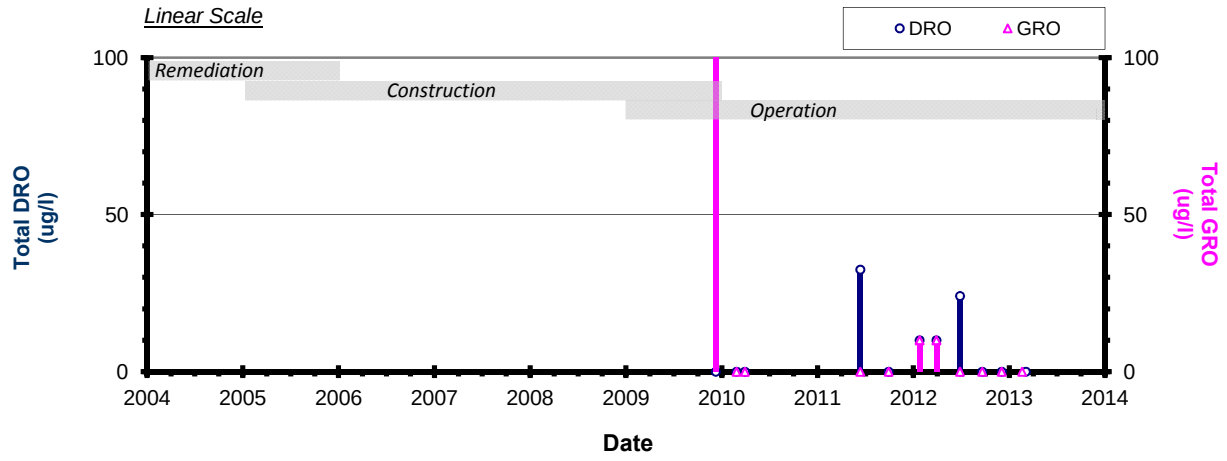
Borehole BH44
(Inside Green Fence)

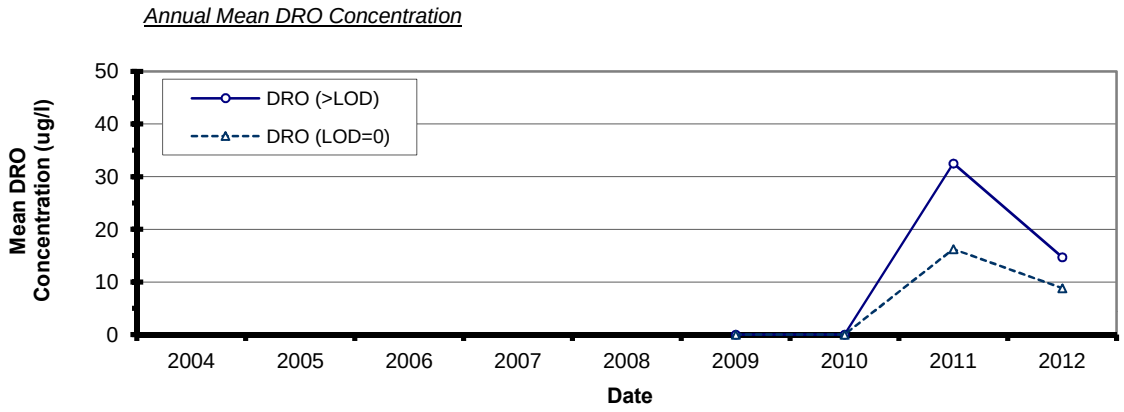


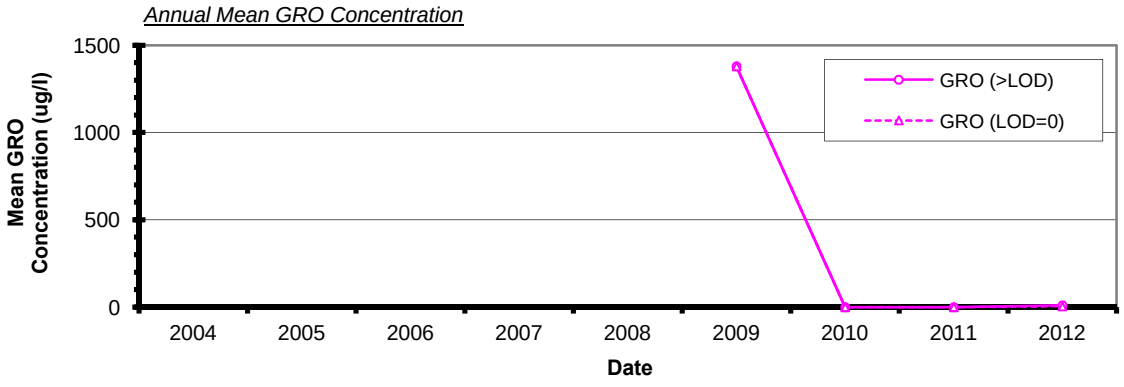




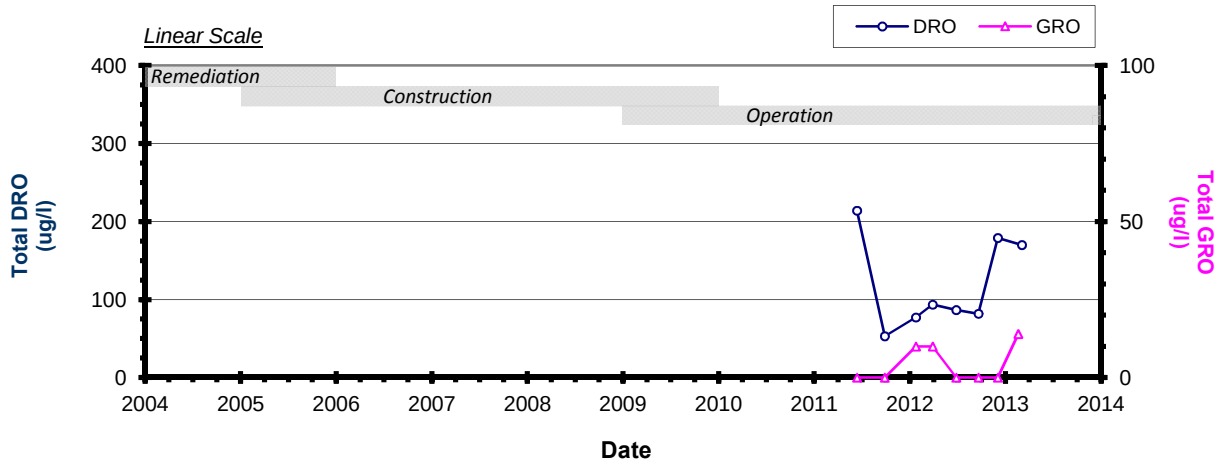
Borehole MW01
(Inside Green Fence)

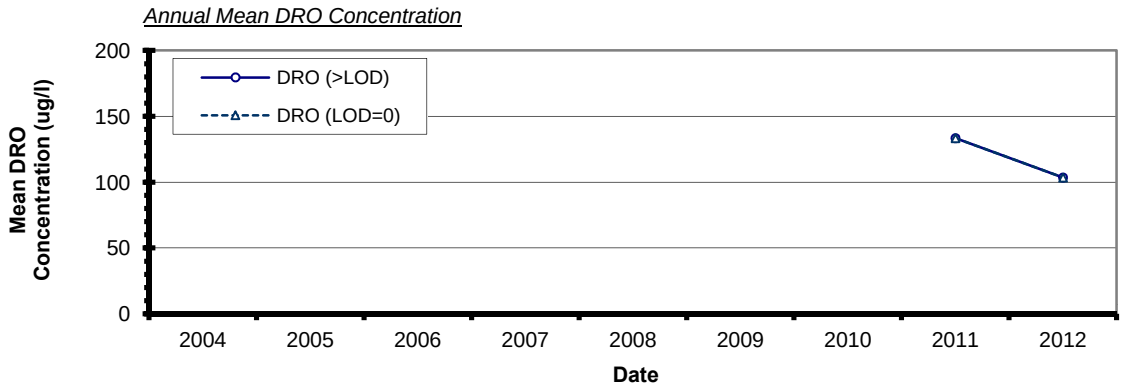


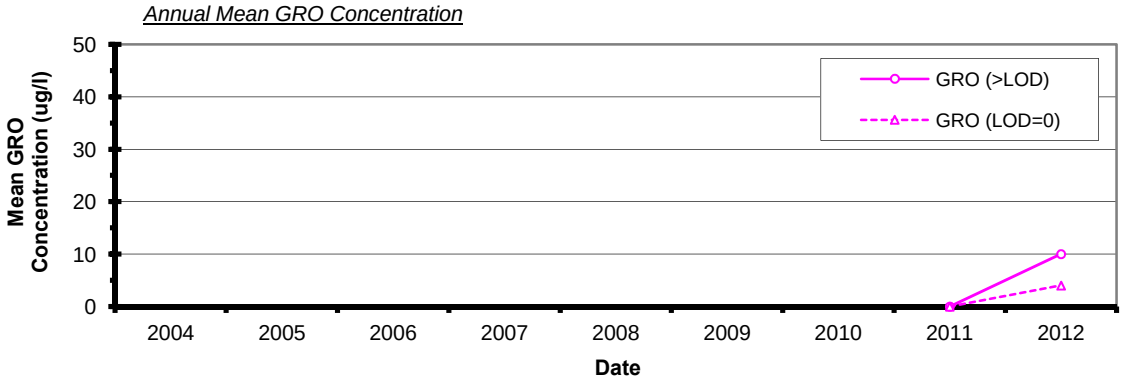




Borehole MW03
(Inside Green Fence)

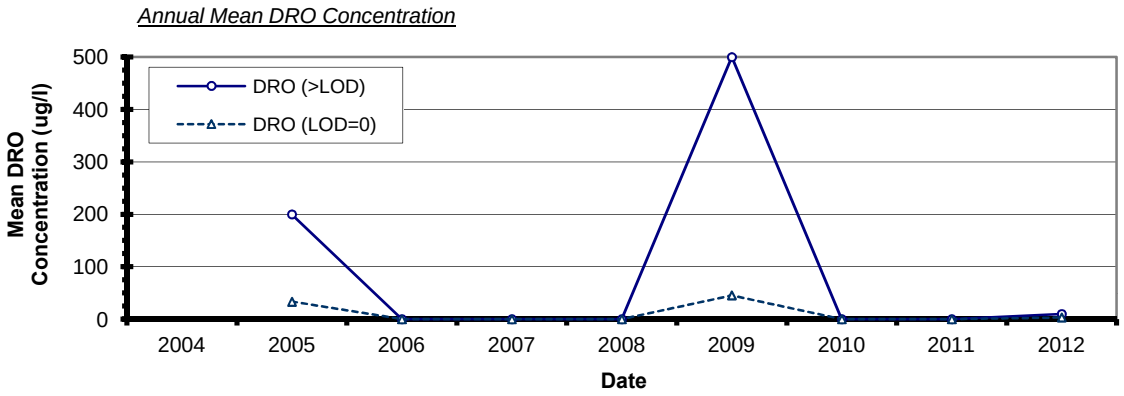


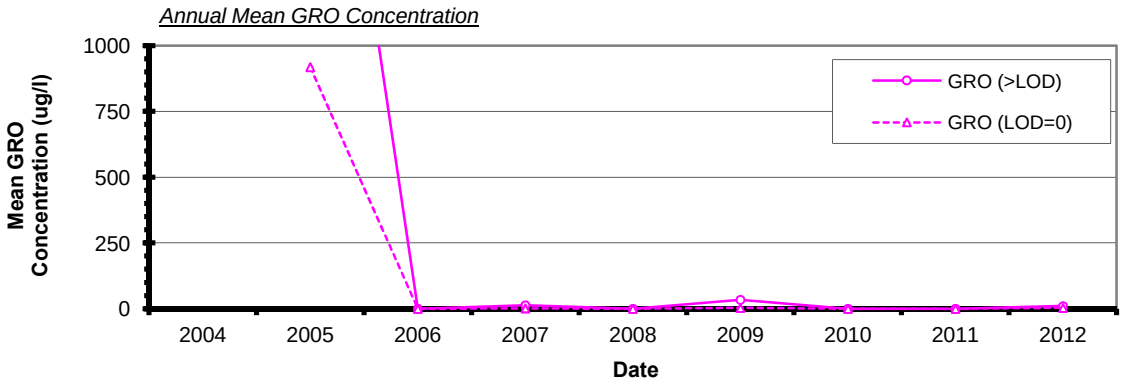


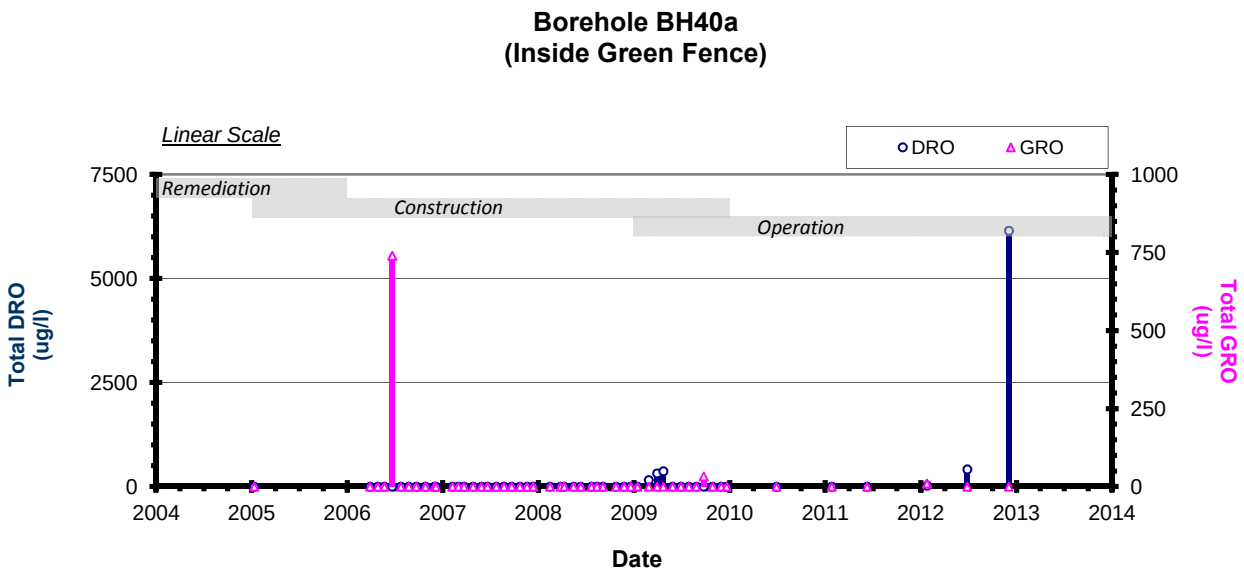


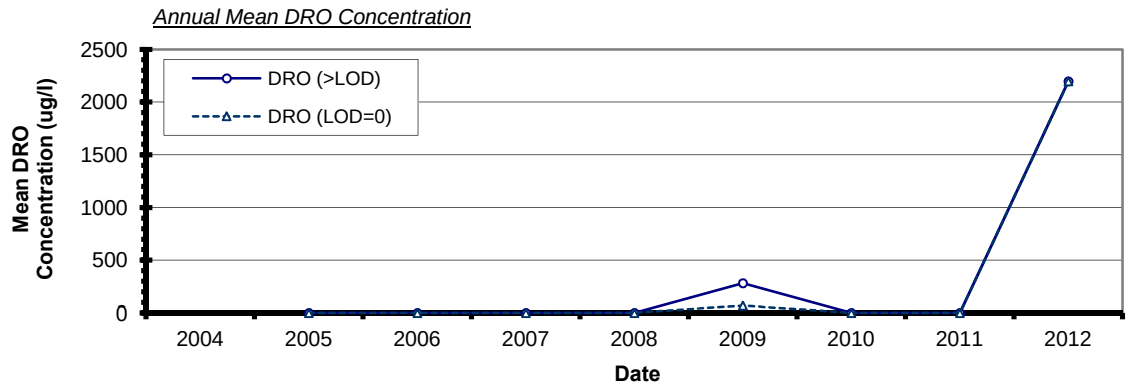
Borehole BH30a
(Inside Green Fence)

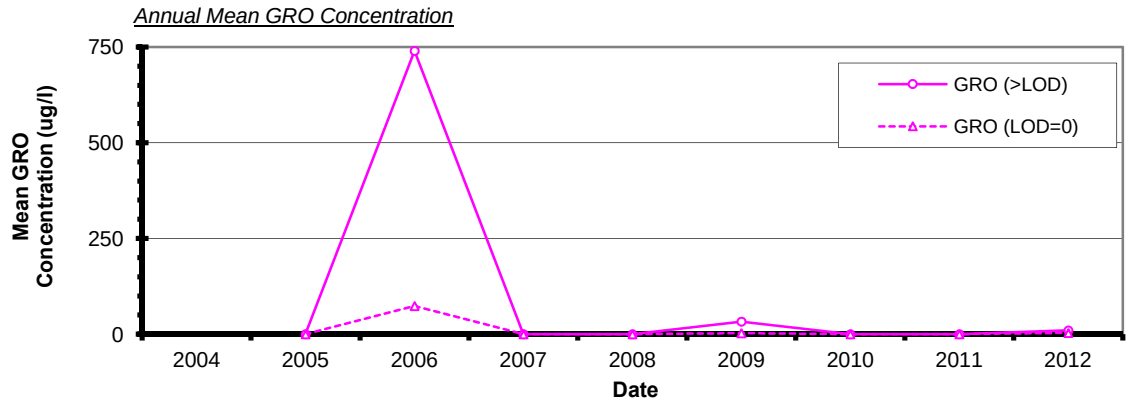




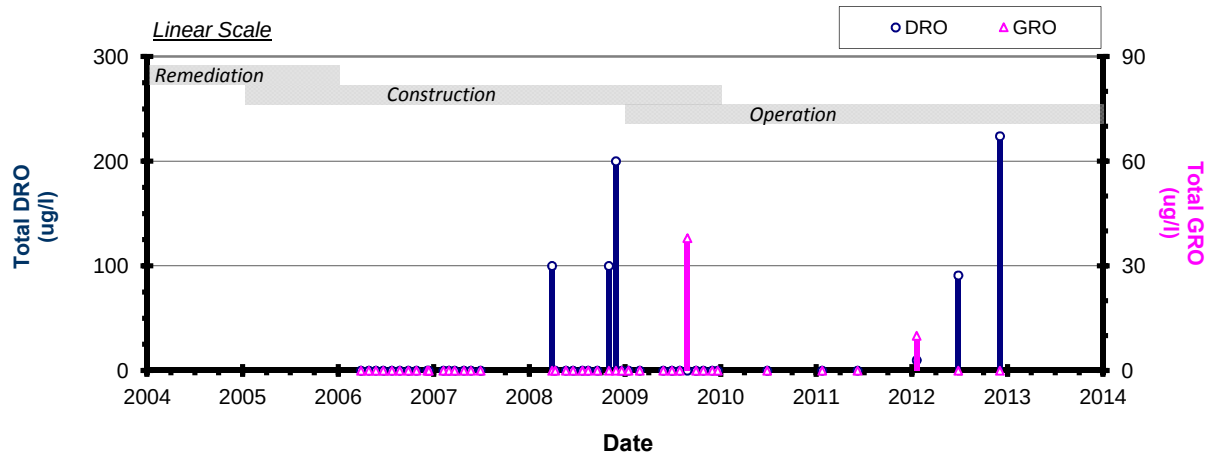


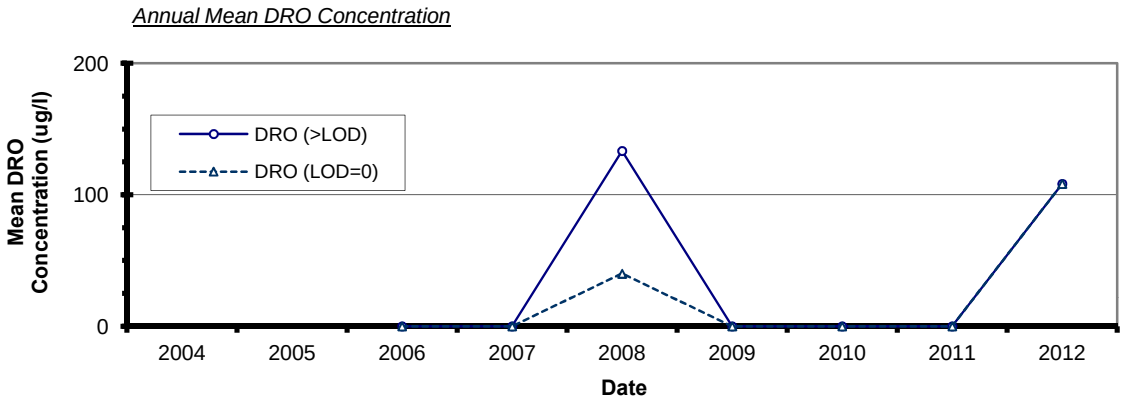

Borehole BH40a
(Inside Green Fence)
Linear Scale
DRO
GRO
Remediation
Construction
Operation
Total DRO (ug/l)
Total GRO (ug/l)
7500
5000
2500
0
1000
750
500
250
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date

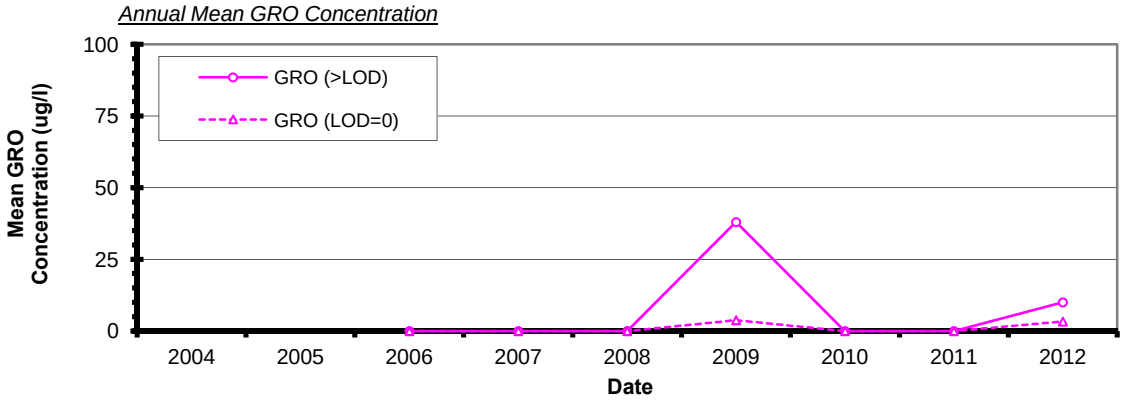

Annual Mean DRO Concentration
DRO (>LOD)
DRO (LOD=0)
Mean DRO Concentration (ug/l)
2500
2000
1500
1000
500
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
Date

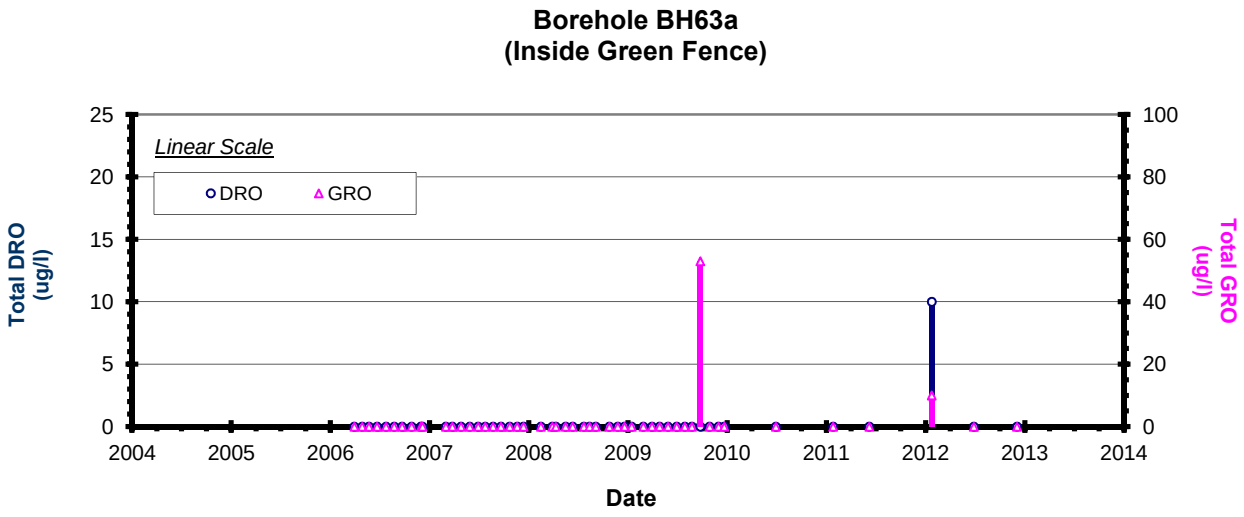

Annual Mean GRO Concentration
GRO (>LOD)
GRO (LOD=0)
Mean GRO Concentration (ug/l)
750
500
250
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
Date

Borehole BH45b
(Inside Green Fence)



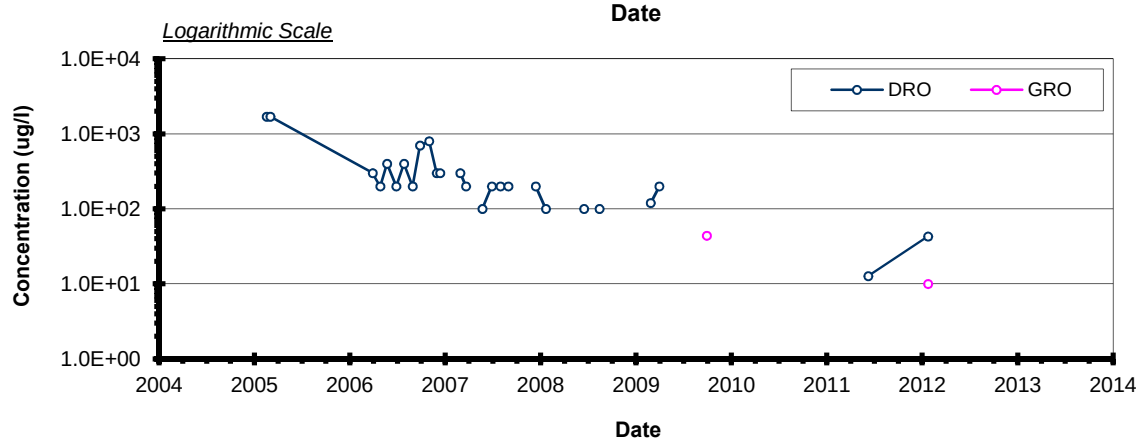


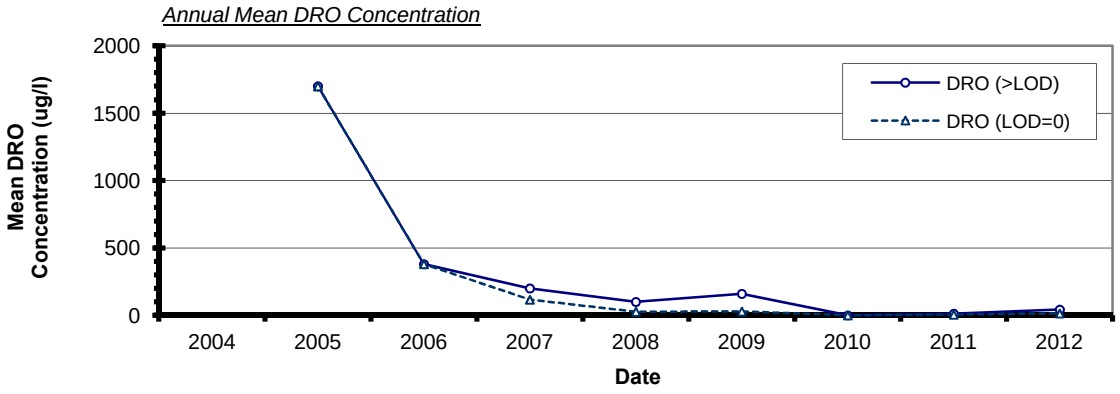


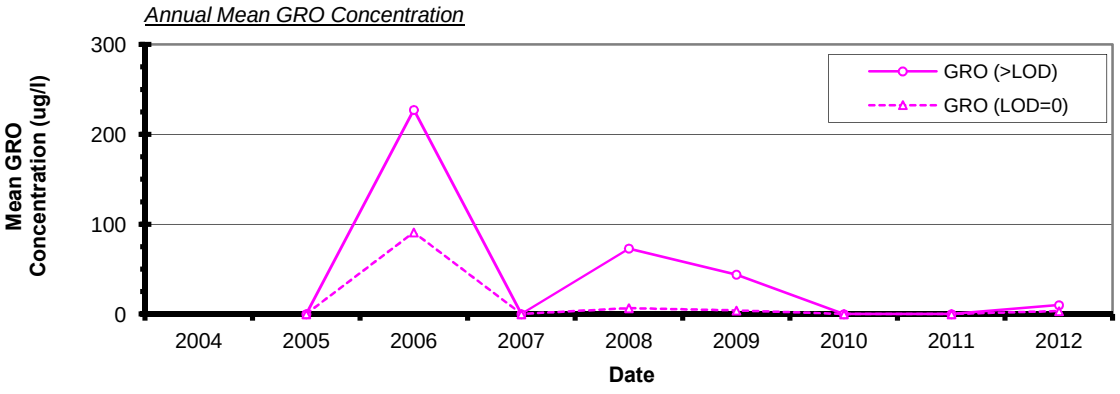

Borehole BH63a
(Inside Green Fence)
Linear Scale
DRO
GRO
Total DRO (ug/l)
Total GRO (ug/l)
25
20
15
10
5
0
100
80
60
40
20
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date

Borehole BHG2b
(Inside Green Fence)

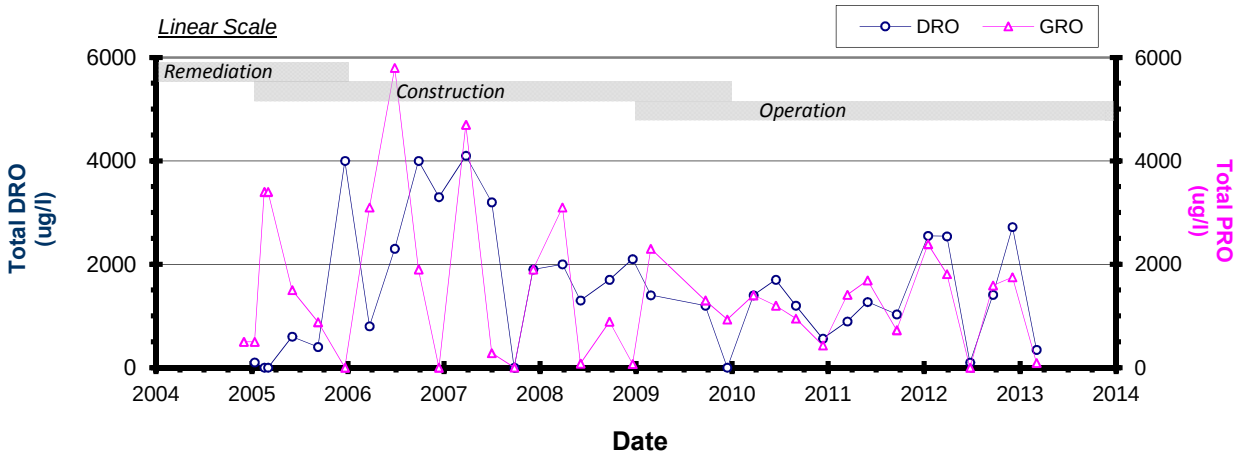


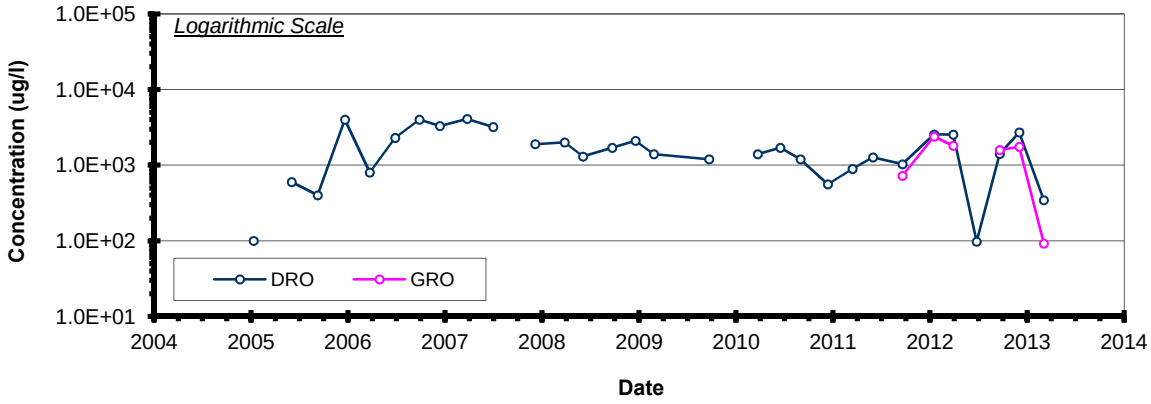


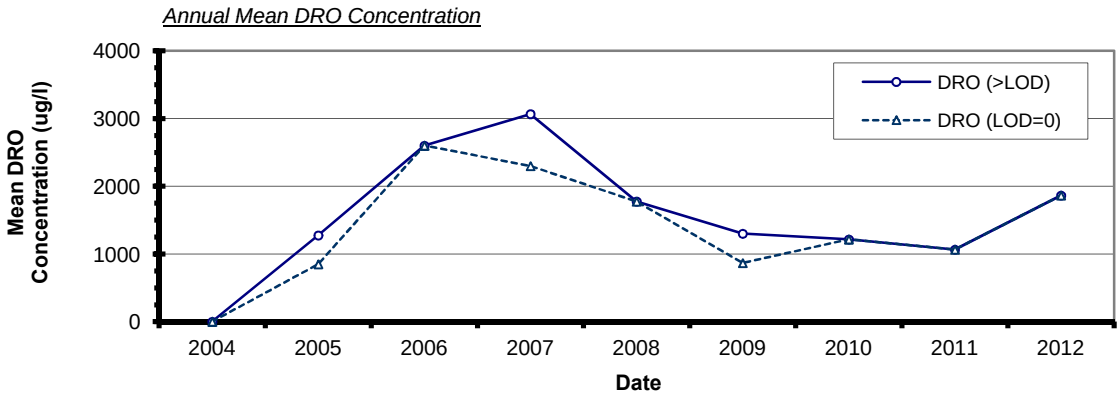


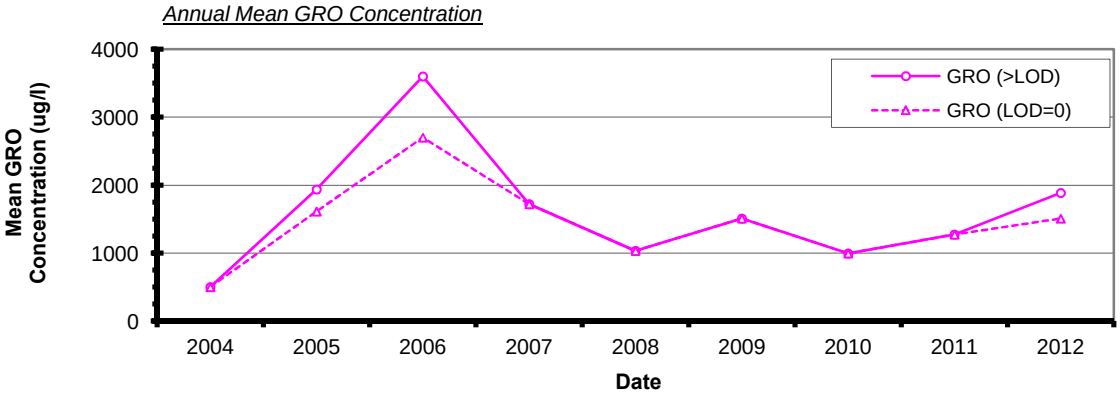


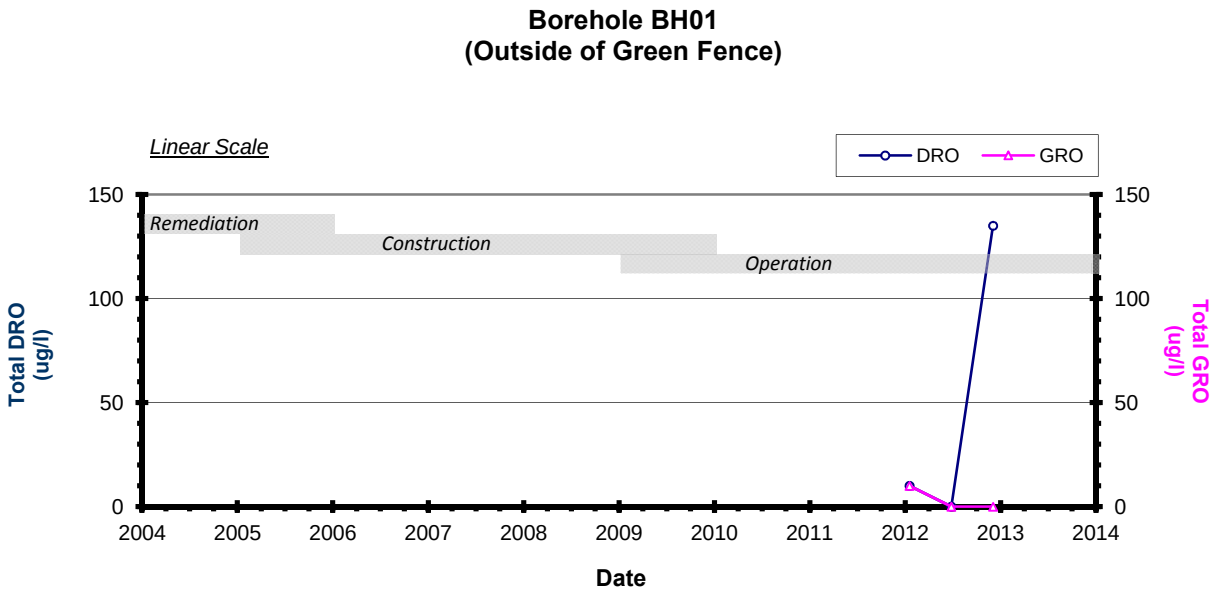
Borehole BH50
(Outside of Green Fence)





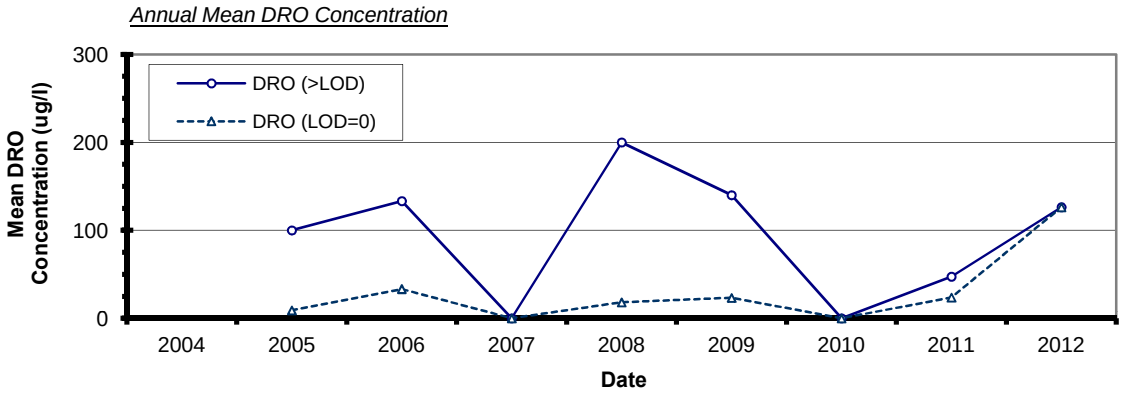


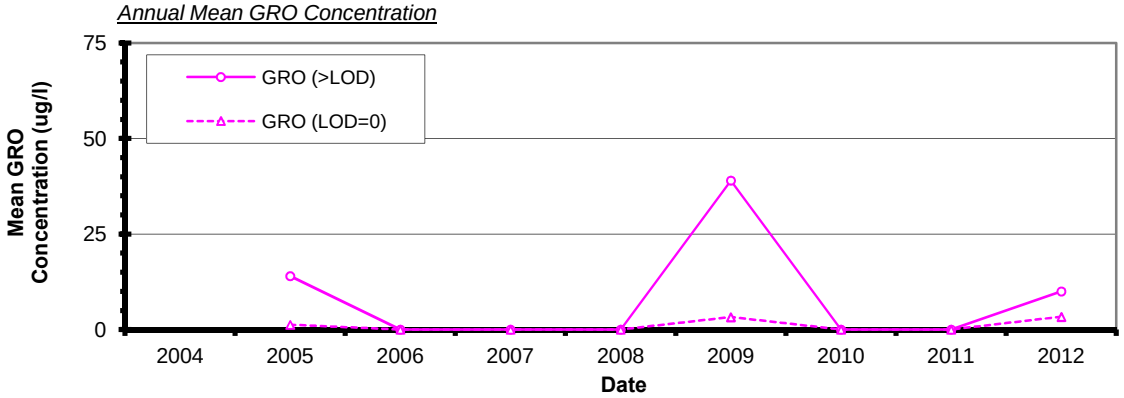



Borehole BH01
(Outside of Green Fence)
Linear Scale
DRO
GRO
Remediation
Construction
Operation
Total DRO (ug/l)
Total GRO (ug/l)
150
100
50
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date

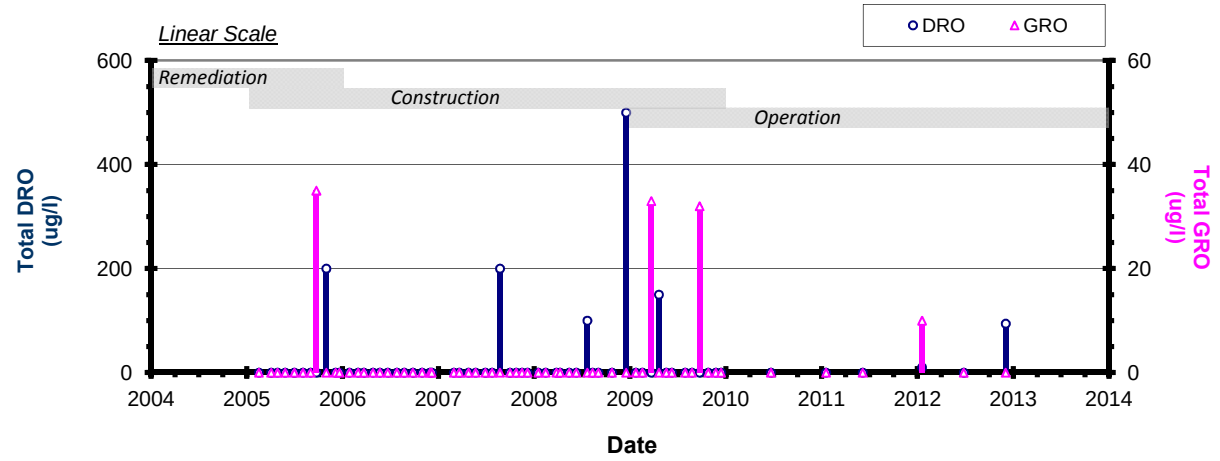
Borehole BH18
(Outside of Green Fence)

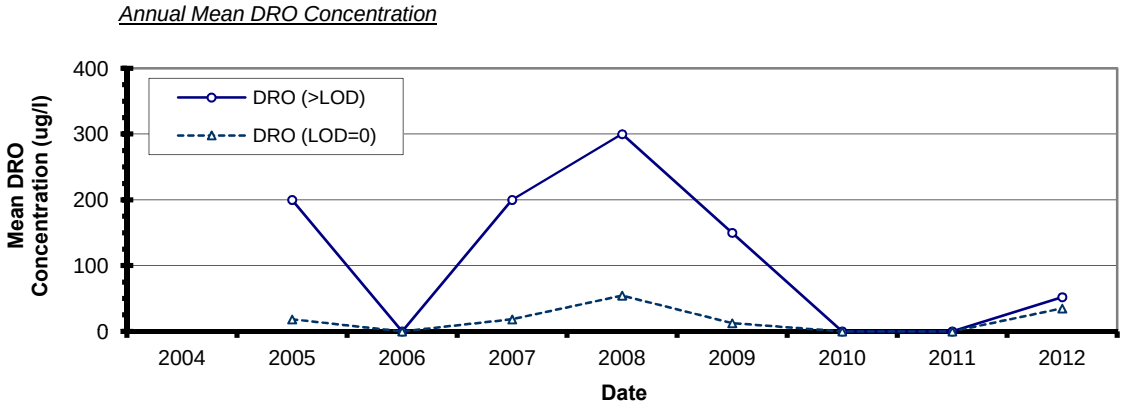


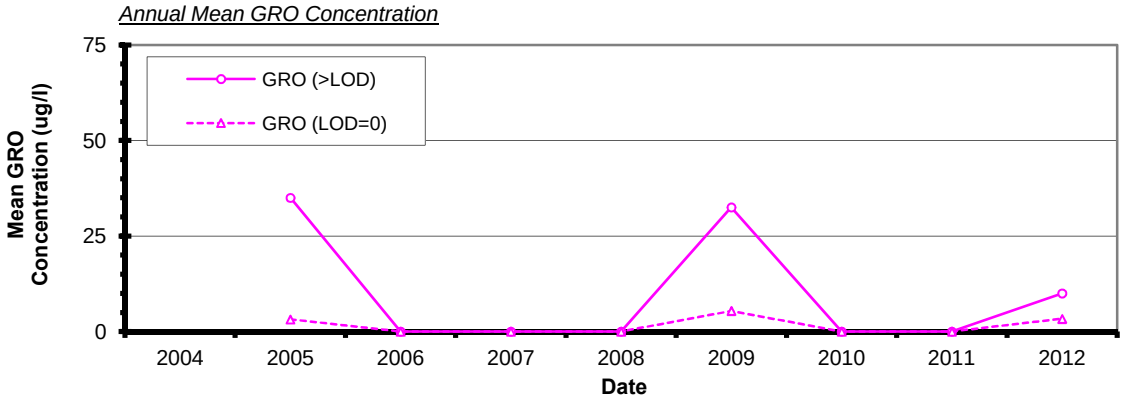




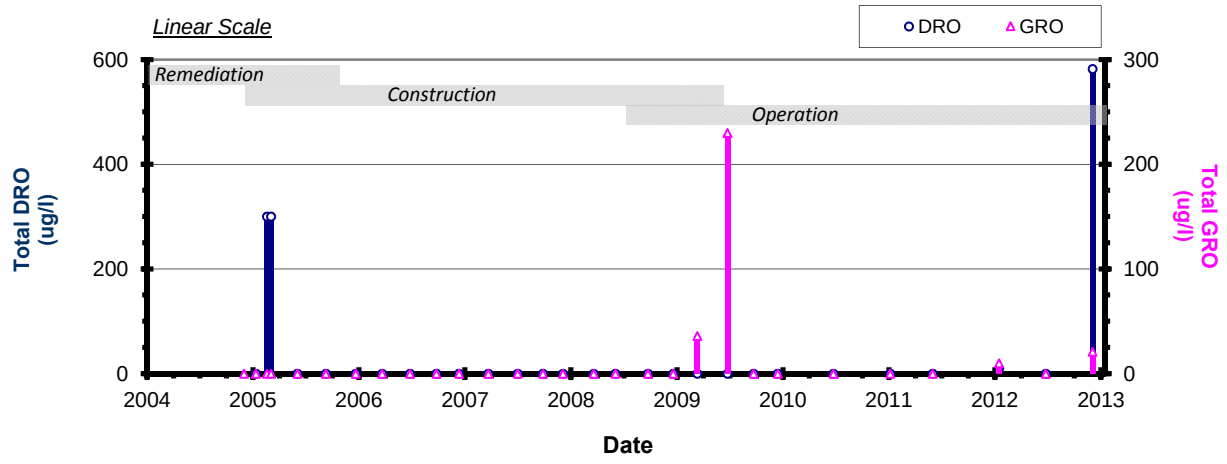
Borehole BH19
(Outside of Green Fence)

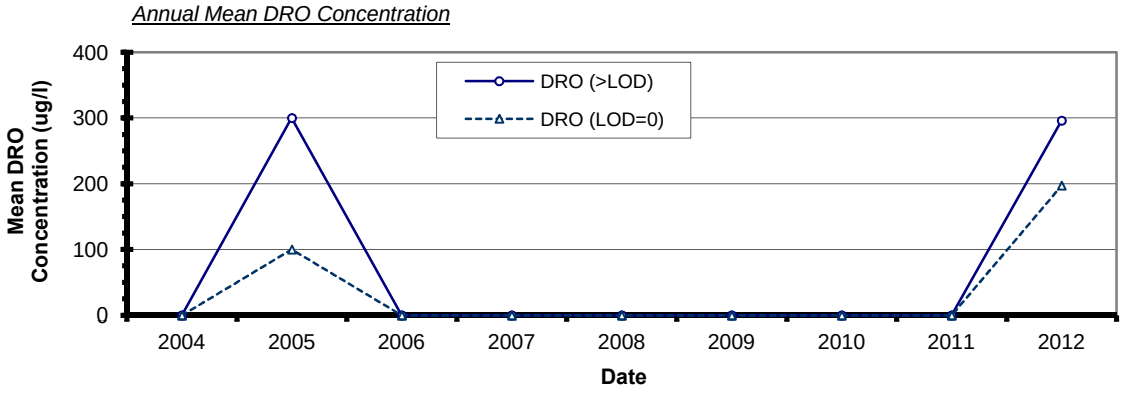


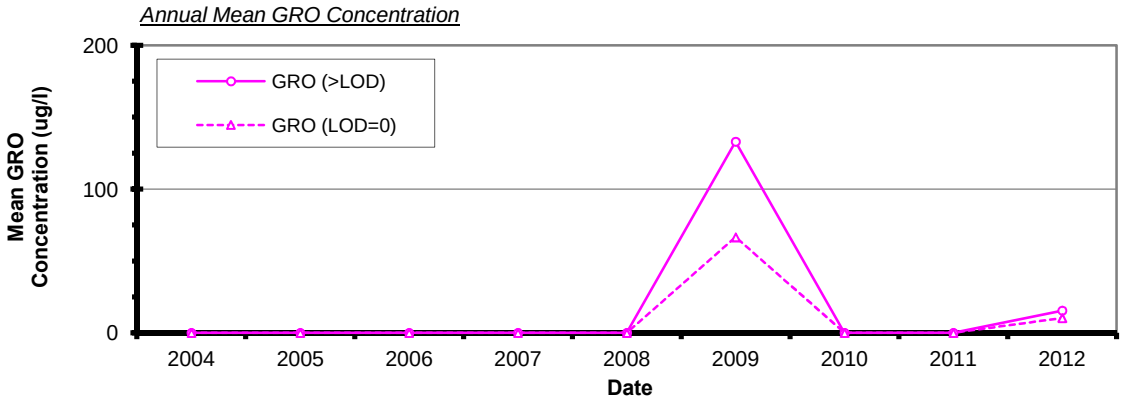




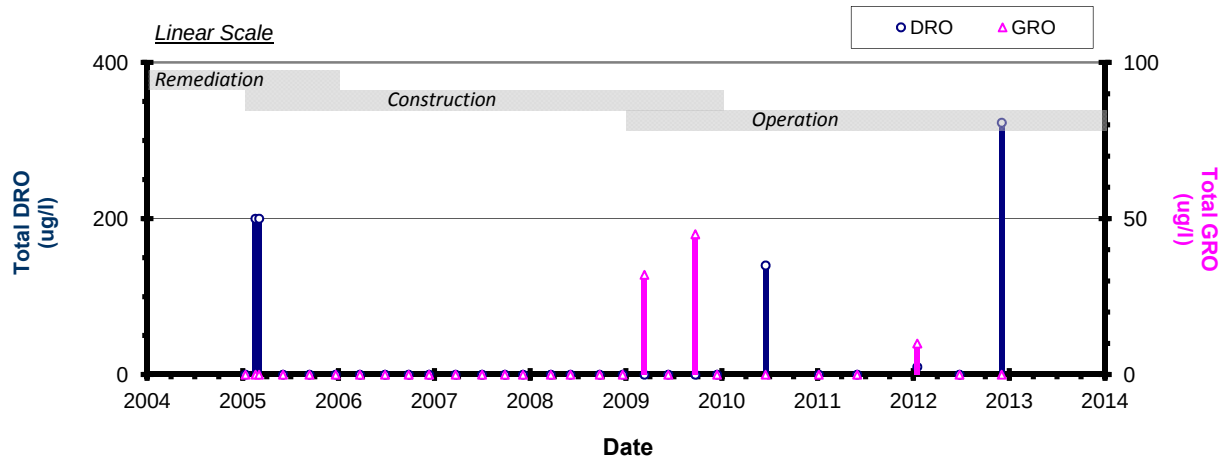
Borehole BH20
(Outside of Green Fence)

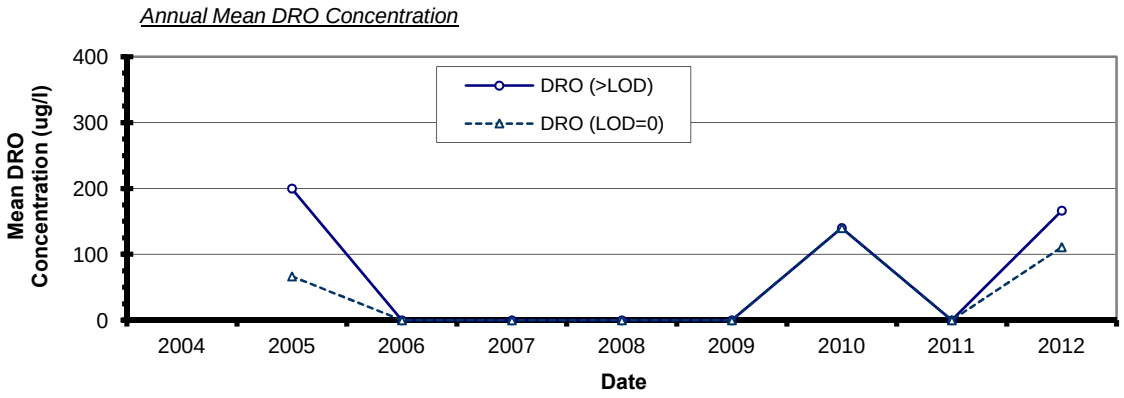


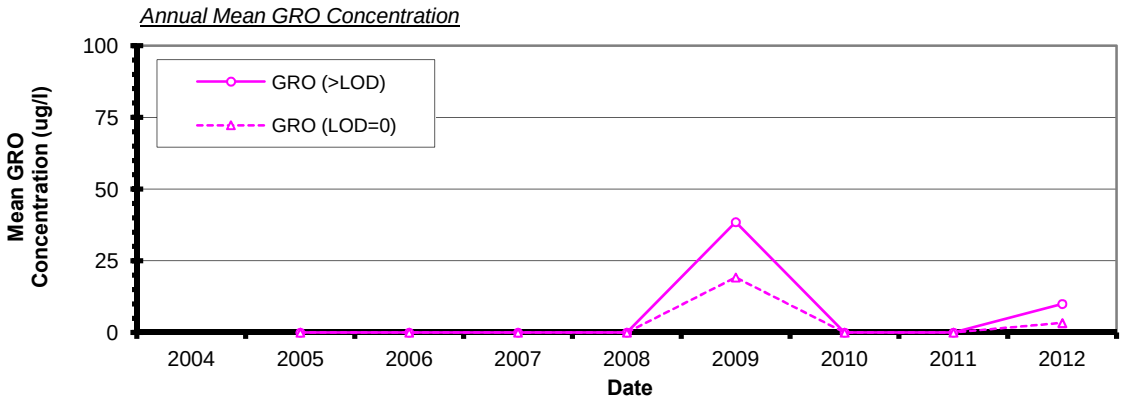


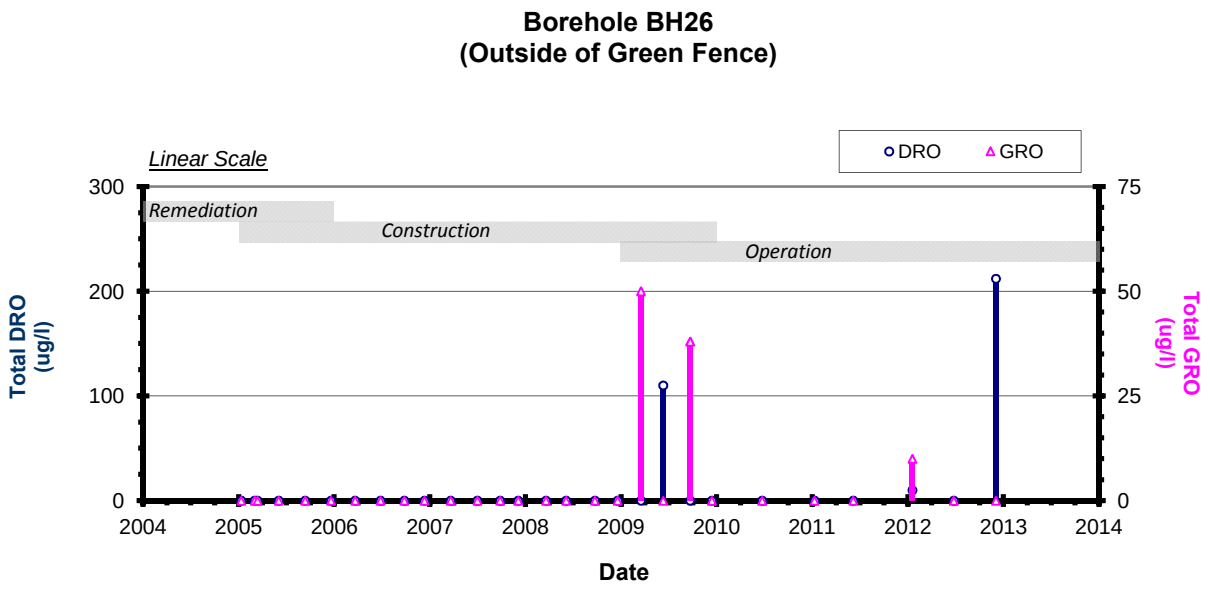


Borehole BH22
(Outside of Green Fence)

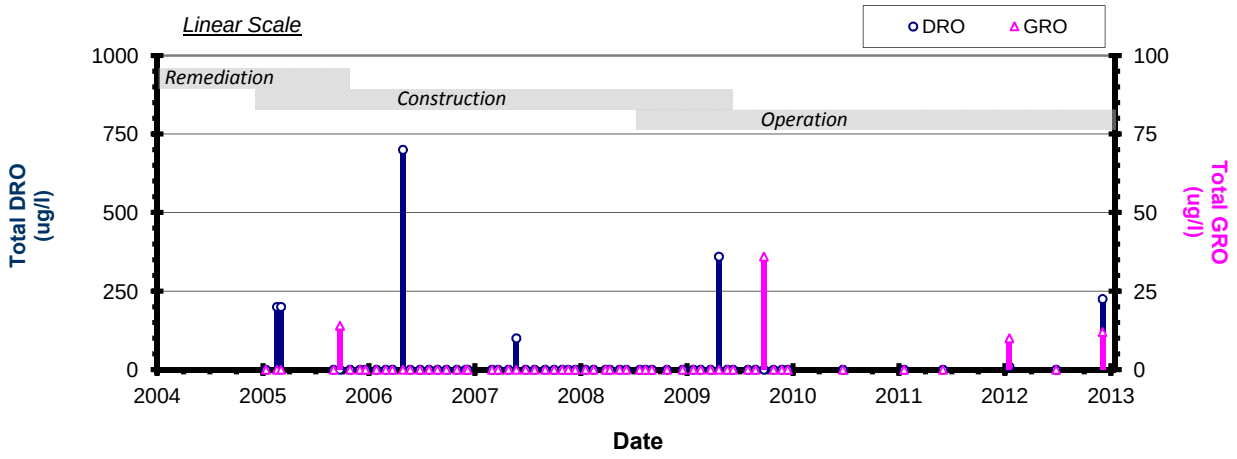


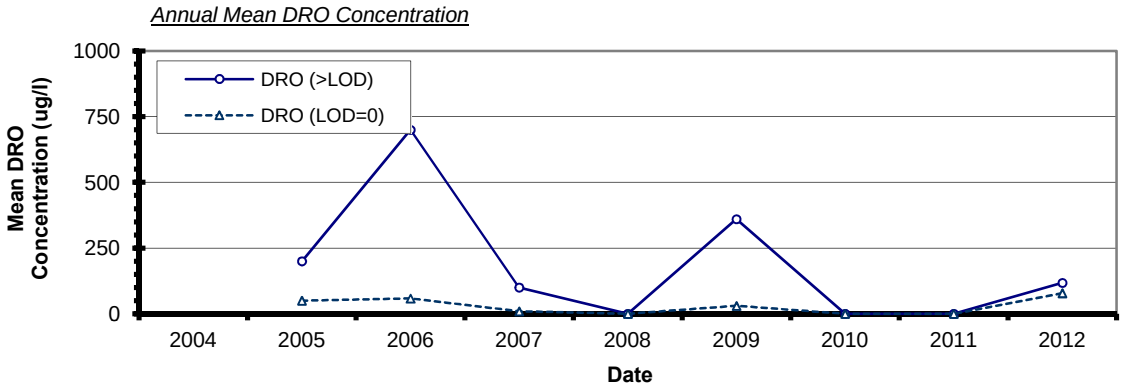


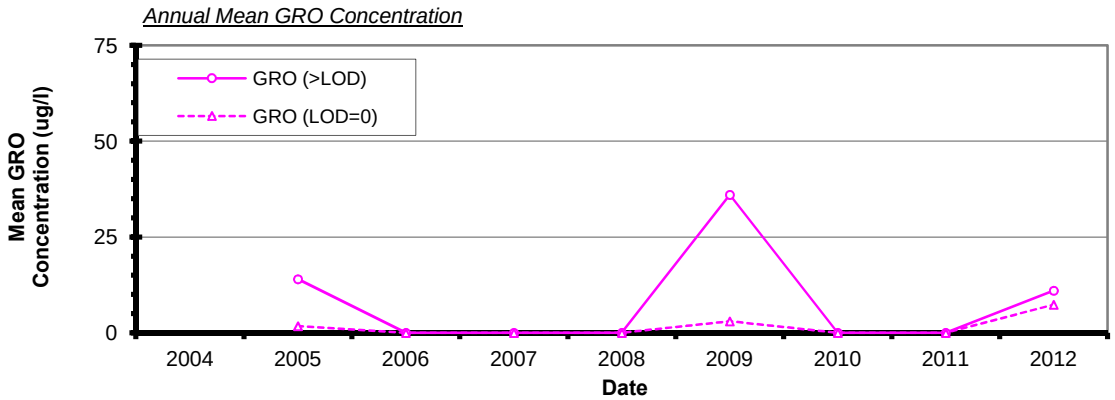



Borehole BH26
(Outside of Green Fence)
Linear Scale
DRO
GRO
Remediation
Construction
Operation
Total DRO (ug/l)
Total GRO (ug/l)
300
200
100
0
75
50
25
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date

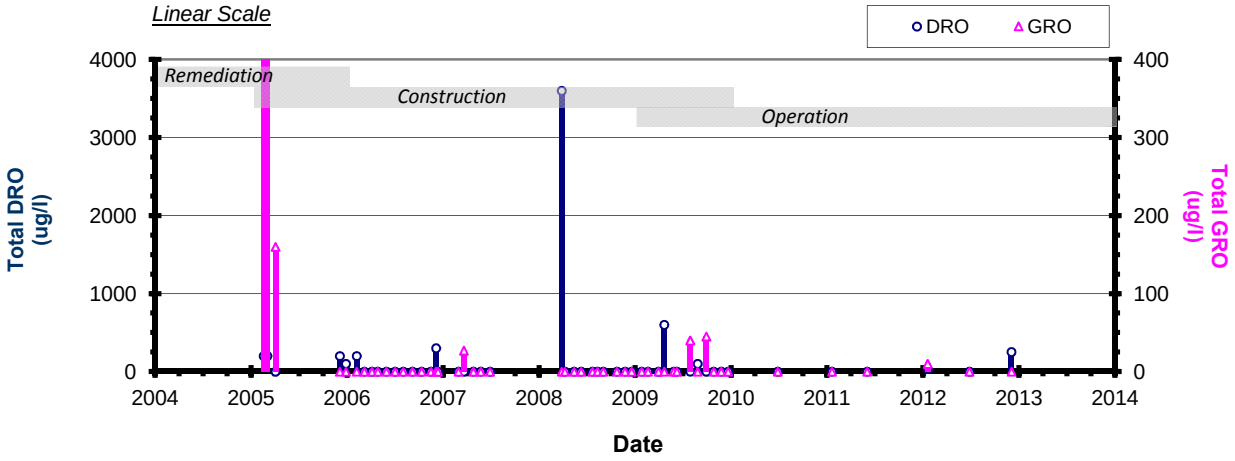
Borehole BH27a
(Outside of Green Fence)

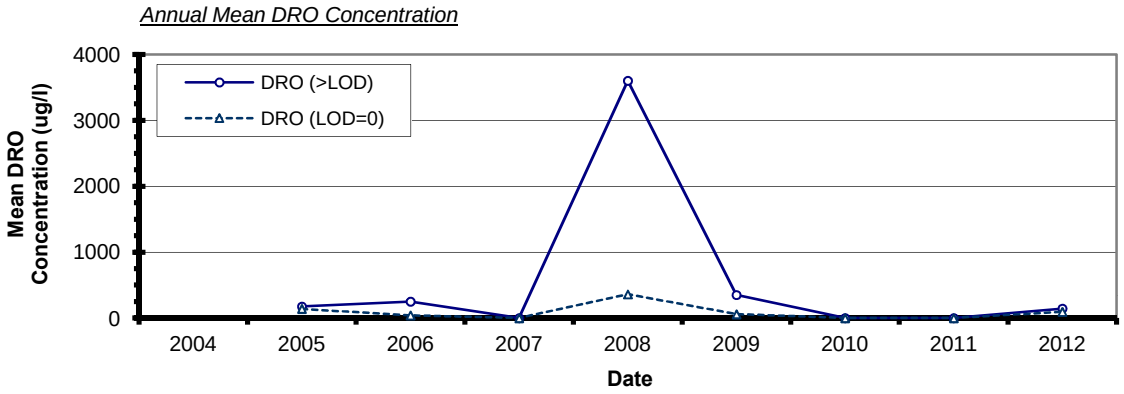


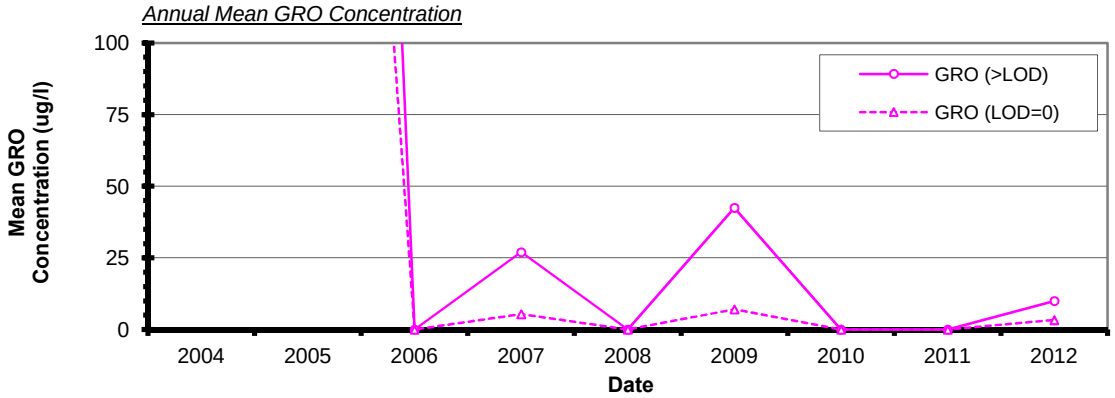




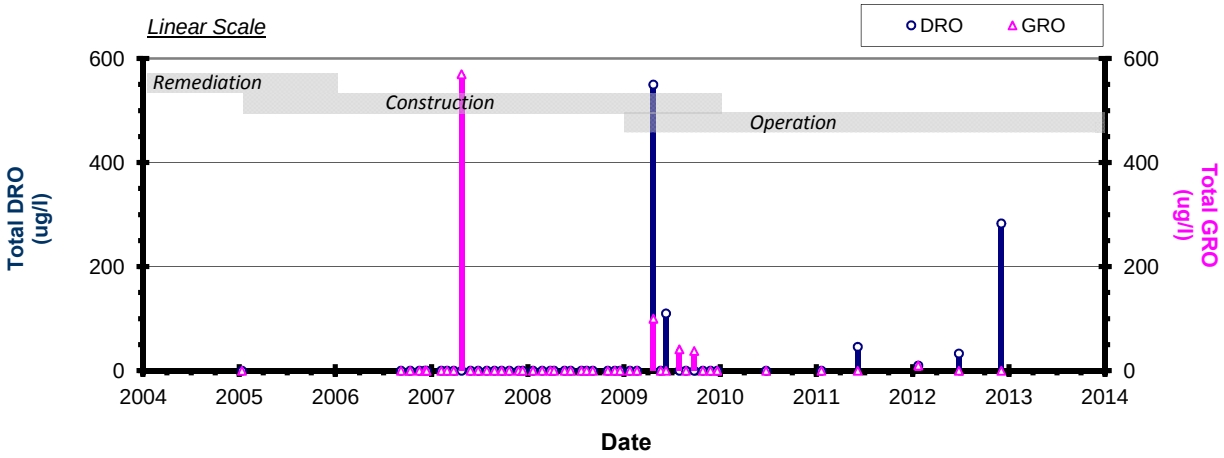
Borehole BH36b
(Outside of Green Fence)

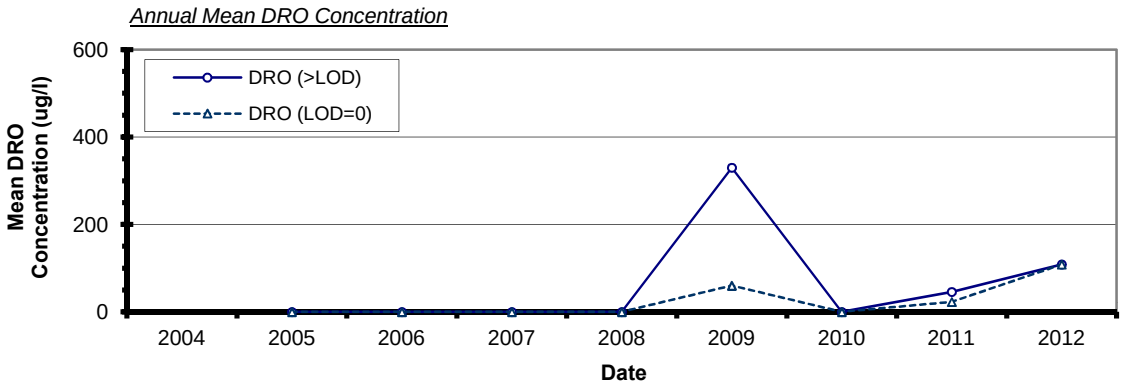


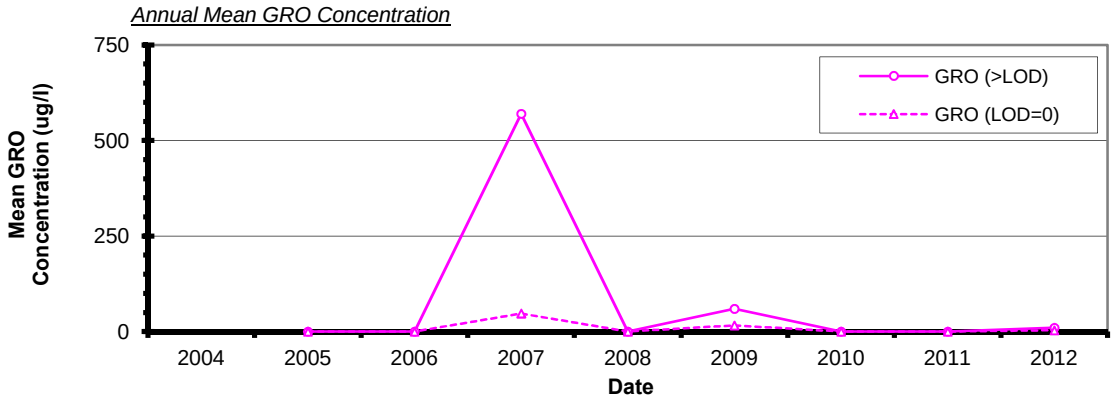




Borehole BH47a
(Outside of Green Fence)

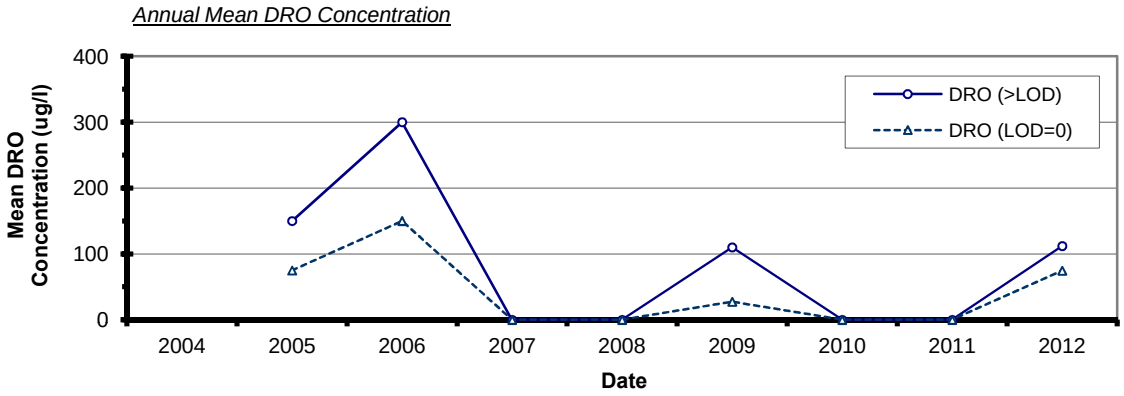


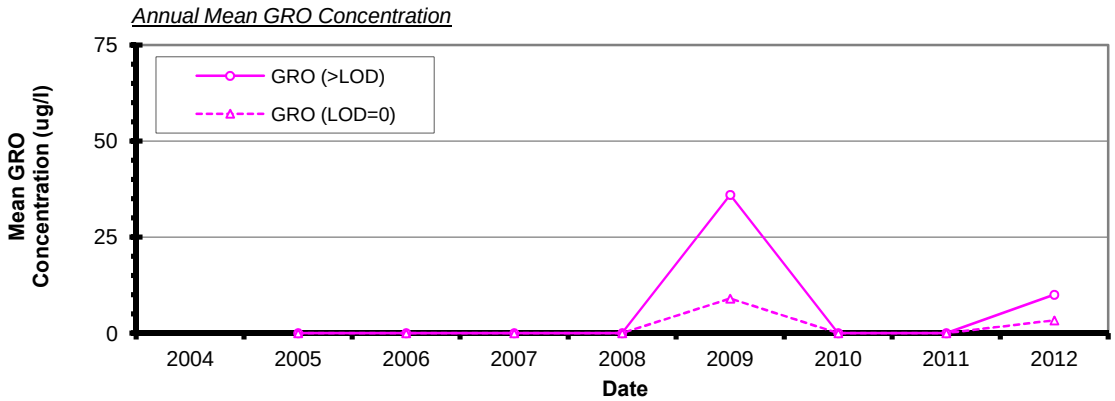




Borehole BH49
(Outside of Green Fence)

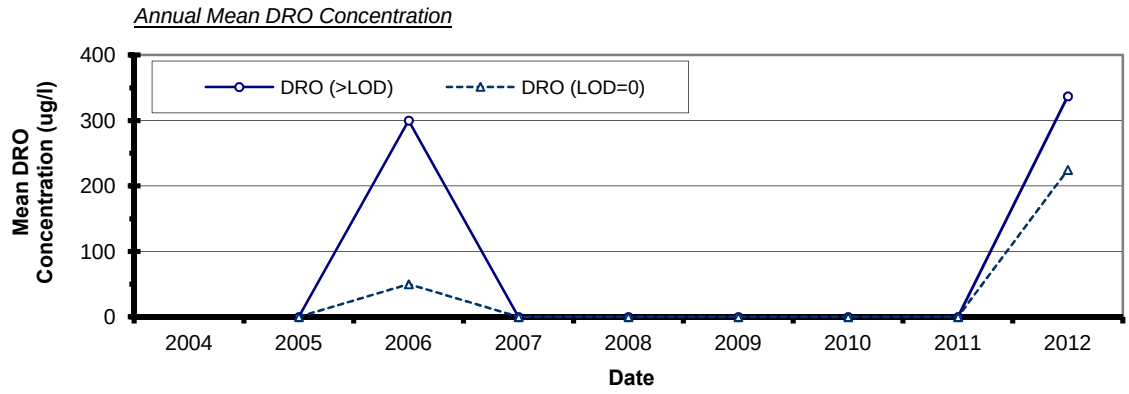


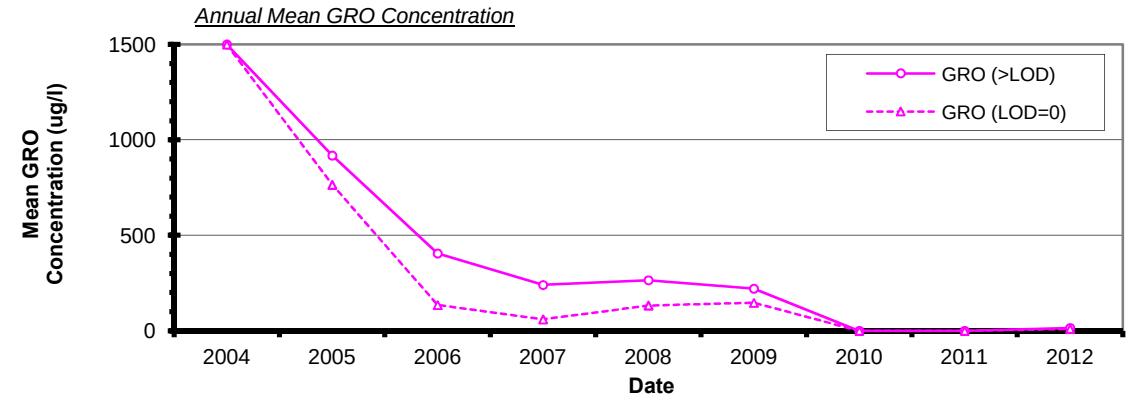


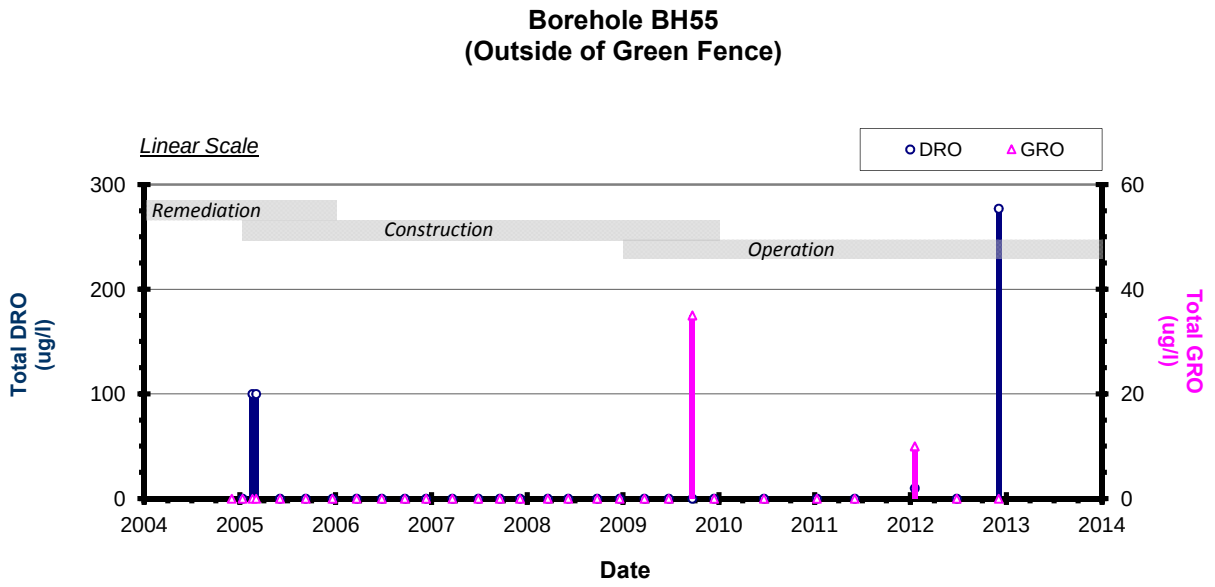


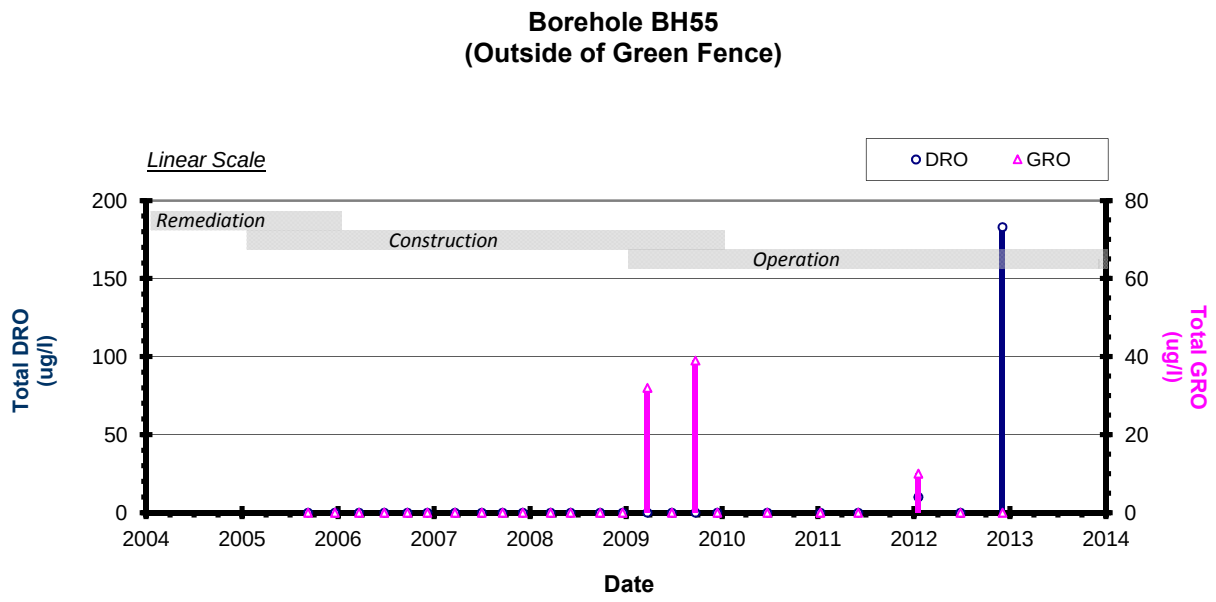
Borehole BH53
(Outside of Green Fence)



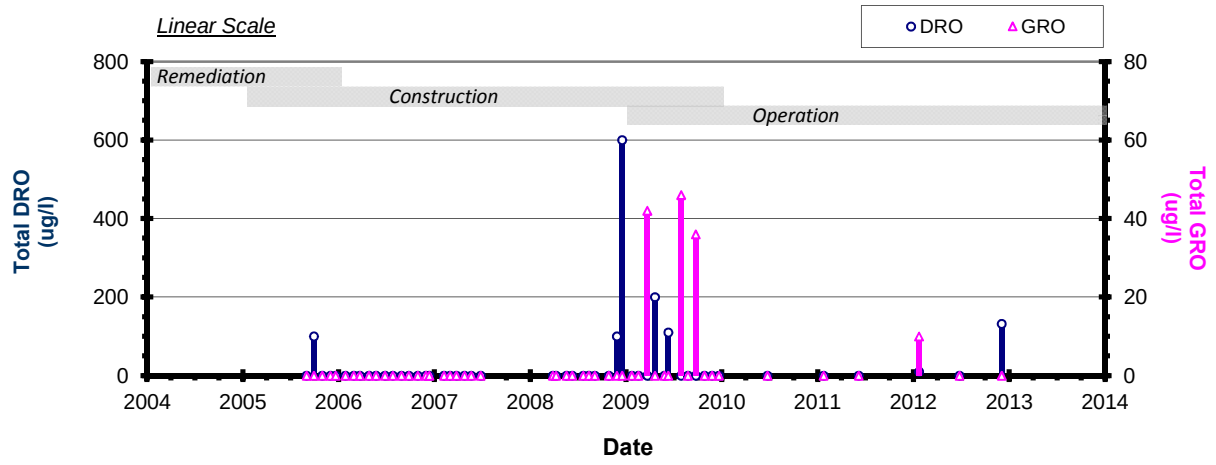


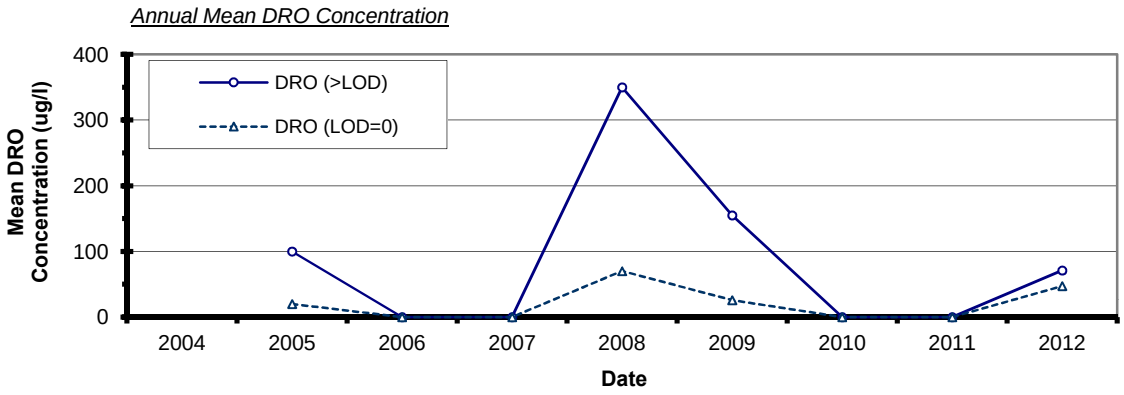


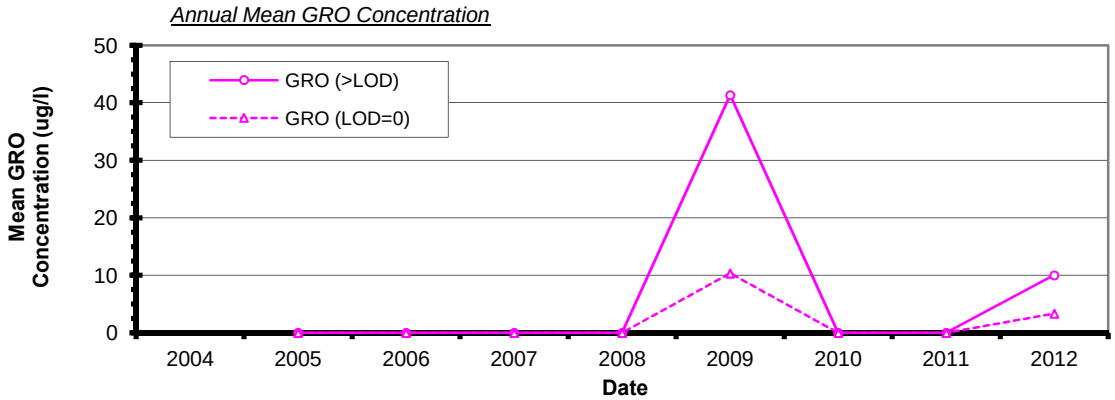

Borehole BH55
(Outside of Green Fence)
Linear Scale
DRO
GRO
Remediation
Construction
Operation
Total DRO (ug/l)
Total GRO (ug/l)
300
200
100
0
60
40
20
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date


Borehole BH55
(Outside of Green Fence)
Linear Scale
DRO
GRO
Remediation
Construction
Operation
Total DRO (ug/l)
Total GRO (ug/l)
200
150
100
50
0
80
60
40
20
0
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date

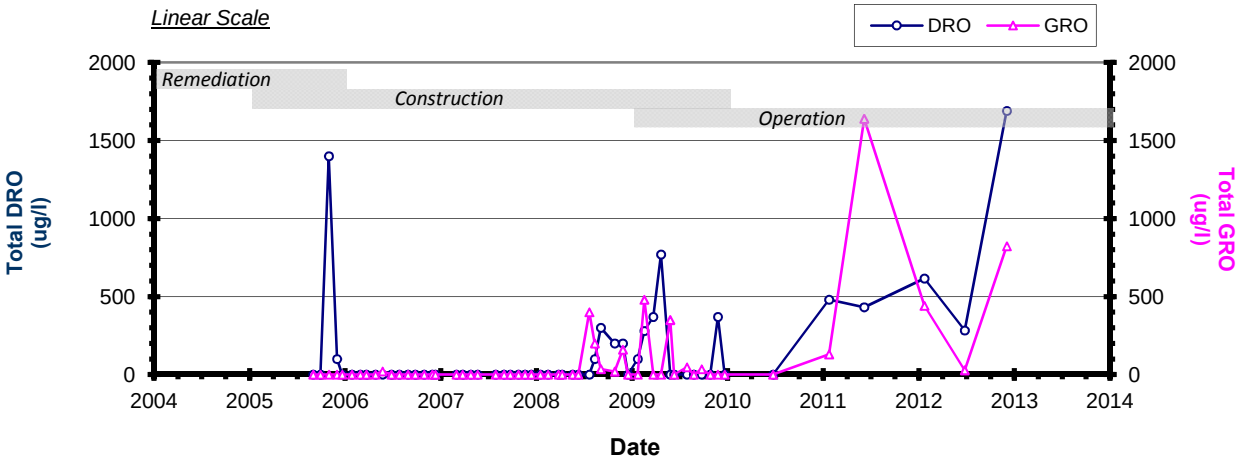
Borehole BH60b
(Outside of Green Fence)

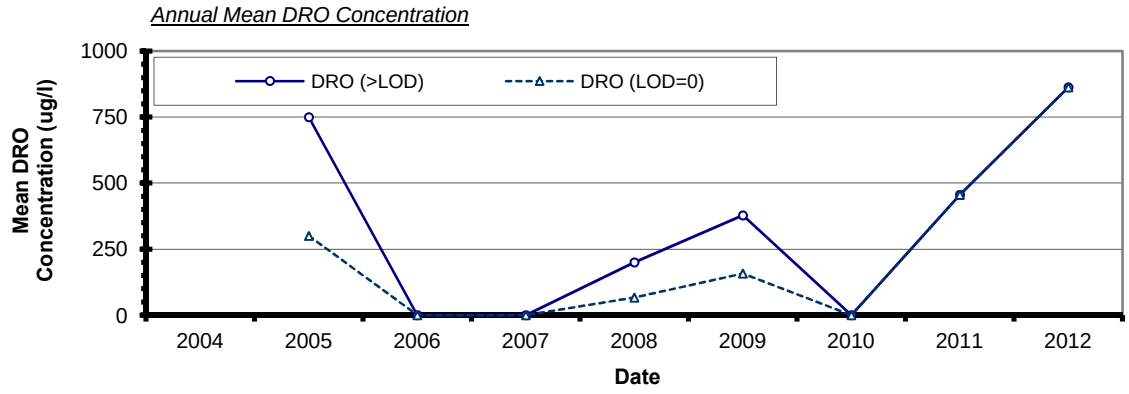


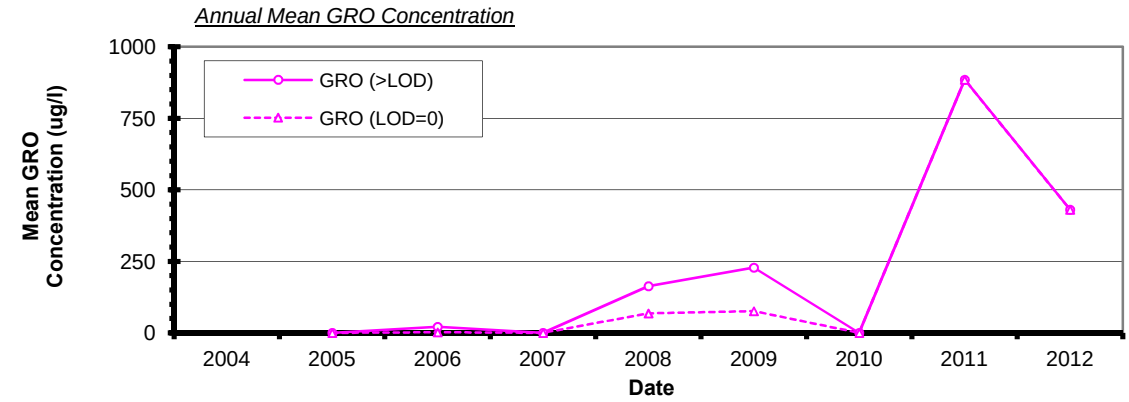




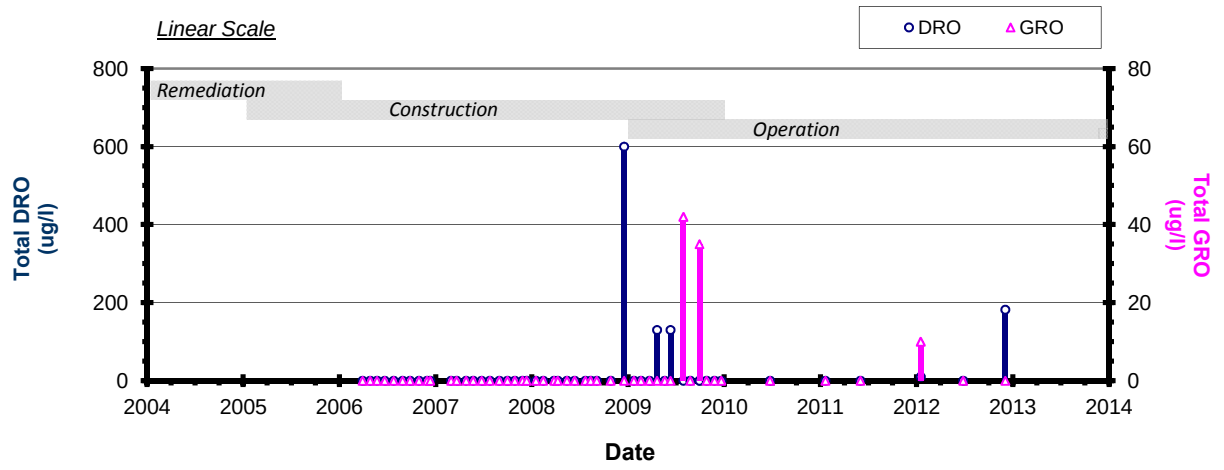
Borehole BH61a
(Outside of Green Fence)

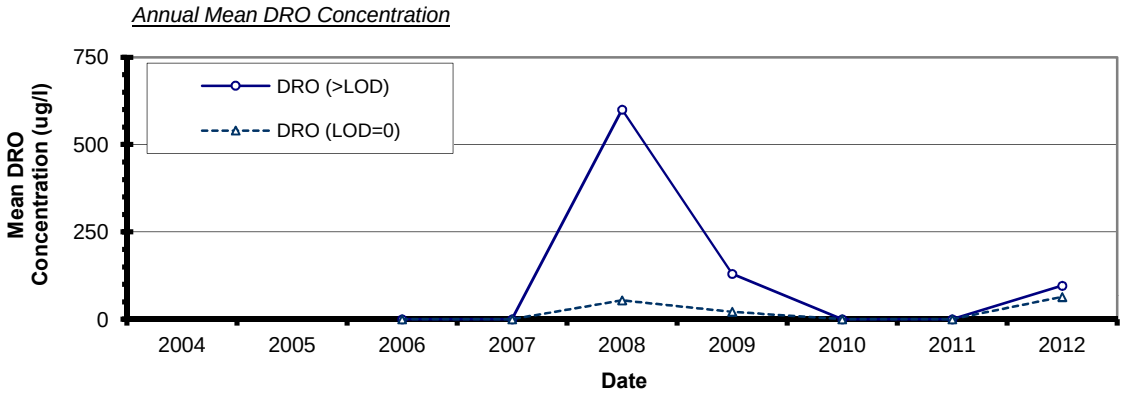


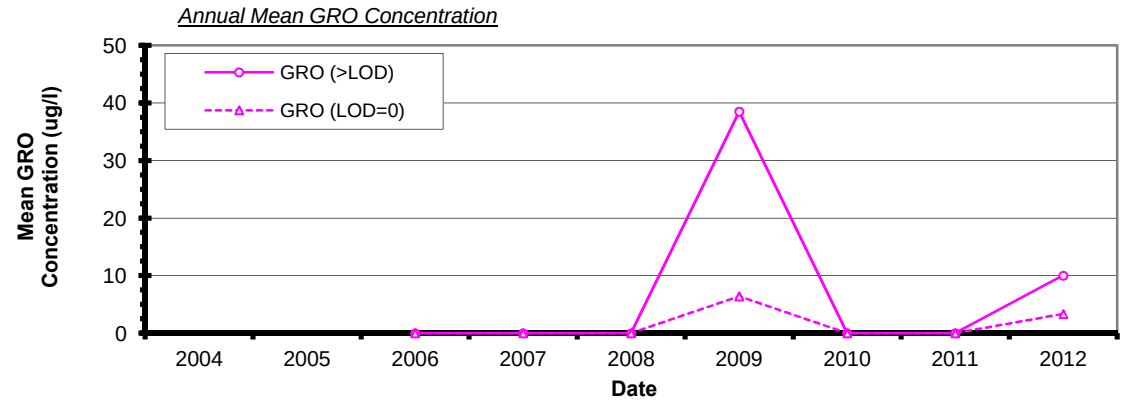




Borehole BH65
(Outside of Green Fence)







Appendix 8

Summary of Trend Analysis

JER5575U SHLNG Groundwater Monitoring Review
Summary of Trend Analysis and Revised Monitoring Strategy

Borehole Group	Borehole ID	Position in Group	Location	Trend Analysis				Current Monitoring Regime		PROPOSED (Revised) MONITORING REGIME		
				Dataset Period	ca. Years	Parameter	Summary	Monitoring Frequency	Monitoring Suite	Monitoring Frequency	Monitoring Suite	Justification & Notes
1. Main Excavation Boundary Wells	BH30a	Eastern Boundary Wells	Inside Green Fence	Jan. 2005 - Present	8	GRO	Very infrequent occurrence in groundwater (9% samples). Low concentration when present. Single occurrence in 2011 and 2012. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	No issue at this location. Already 6-monthly sampling.
						DRO	Very infrequent occurrence in groundwater (5% samples). Low concentration when present. Single occurrence in 2011 and 2012. NO TREND OF CONCERN					
	BH36b	Eastern Boundary Wells	Outside Green Fence	Mar. 2008 - Present	4.5	GRO	High concentration early 2005. Subsequent infrequent occurrence in groundwater at low concentration. STABLE. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	No trends of concern. Review at end of 2013.
						DRO	Infrequent occurrence in groundwater. Spike in concentration in 2008 following borehole reinstatement since when concentrations have been low or absent. NO TREND OF CONCERN					
	BH65	Northern Boundary Well	Outside Green Fence	Mar. 2006 - Present	6.5	GRO	No GRO between 2006 and mid-2009. Two occurrence in 2009. Only single occurrence in 2010, with concentration at LOD. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Demonstrate absence of DRO. Reconsider after trend analysis at end of 2013.
						DRO	No DRO between 2006 and end-2008. Maximum DRO at end of 2008. Only single occurrence in 2010 and 2011 with a concentration at LOD. Anomalous occurrence of DRO in December 2012 monitoring round but within historic variability. NO TREND OF CONCERN					
	BH59	Northern-eastern Boundary Well	Outside Green Fence	Sep. 2005 - Present	7	GRO	Very occasional occurrence in groundwater (3 of 24 samples) at low concentration. Does not exceed LOD since 2010. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Demonstrate absence of DRO. Reconsider after trend analysis at end of 2013.
						DRO	Generally absent or at low concentration. Anomalously spike in December 2012. NO TREND OF CONCERN (Confirm Spike in future rounds)					
2. Monitoring Wells South of Main Excavation Area	BH18	Up-gradient	Outside Green Fence	Feb. 2005 - Present	8	GRO	Largely absent from groundwater (3 of 64 samples), with single occurrence at LOD in period between 2011 and present. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Continue to determine trends in DRO. Review monitoring frequency after collection of another years data.
						DRO	Occurs occasionally in groundwater (17% of samples analysed) but has been more routinely observed in 2011 and 2012. Anomalous concentration in December 2012 round, but within historical variability. Gnerally **STABLE.** **NO TREND OF CONCERN**					
	BH19	Up-gradient	Outside Green Fence	Feb. 2005 - Present	8	GRO	Infrequent occurrence in groundwater (6% of samples). Absent or low concentration. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Continue to determine trends in DRO.
						DRO	Infrequent occurrence in groundwater (11% of samples). Absent or at low concentration. STABLE NO TREND OF CONCERN					
	BHG2b	Up-gradient	Inside Green Fence	Mar. 2008 - Present	4.5	GRO	Only observed in 2 samples out of 50 with concentration below 50 ug/l/. Lowest concentration in most recent analysis. General DECLINING TREND.	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Confirm stability or continued declining trend
						DRO	Occurs infrequently (22% of Samples). General DECLINING trend since 2008 / 2009.					
	BH01	Mid-flow field	Outside Green Fence	Jan. 2012 - Present	1	GRO	Very short dataset, but low concentration or absent. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Improve dataset and monitoring DRO rise
						DRO	Very short dataset, with single spike of DRO observed in December 2012 round. NO TREND OF CONCERN					
	BH40a	Mid-flow field	Inside Green Fence	Jan. 2005 - Present	8	GRO	Very infrequent occurrence in groundwater (6% samples), with low conctration. Single occurrence from 2010 to present. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	QUARTERLY	No change proposed	Increase frequency for ***1 year*** to confirm or otherwise anomalous recent trend in DRO.
						DRO	Infrequent occurrence in groundwater (12% samples). Low concentration when present. Anomalous occurrence in Dec-12 at historical maximum. Possible RISING TREND.					
	BH45b	Mid-flow field	Inside Green Fence	Mar. 2008 - Present	4.5	GRO	Very infrequent occurrence in groundwater (2 of 42 samples analysed). Single occurrence from 2010 to present. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	QUARTERLY	No change proposed	Increase frequency for ***1 year*** to confirm or otherwise anomalous recent trend in DRO.
						DRO	Infrequent occurrence in groundwater (6 of 42 samples) and low concentration when present. Anomalopusly high conctration in December 2012 (historical maximum) indicating possible rising trend. Posssible RISING TREND					
	BH63a	Down-gradient	Inside Green Fence	Mar. 2006 - Present	6.5	GRO	Only observed in 2 samples out of 50 with concentration between Limit Of Detection and 53 ug/l/. Lowest concentration in most recent analysis. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Effectively absent from groundwater. No trends of concern. Long dataset.
						DRO	Only observed in single analysis out of 50 at Limit of Detection. NO TREND OF CONCERN					

Appendix 8
Summary of Trend Analysis Recommendations

Borehole Group	Borehole ID	Position in Group	Location	Trend Analysis				Current Monitoring Regime		PROPOSED (Revised) MONITORING REGIME		
				Dataset Period	ca. Years	Parameter	Summary	Monitoring Frequency	Monitoring Suite	Monitoring Frequency	Monitoring Suite	Justification & Notes
3. Valley Area Up-stream of Skim Pond	BH41a	Sludge Pit	Inside Green Fence	Sep. 2005 - Present	7	GRO	Increase in GRO concentration to a maximum in 2007 followed by general **declining** trend to lower concentrations. Generally declining, with and low concentrations in 2012 / 13. DECLINING	Monthly	DRO; GRO; SVOCs	QUARTERLY	No change proposed	Owing to STABLE or DECLINING trends during operational phase.
						DRO	Increase in concentrations to a maximum in 2007, followed by general decline up to 2011. Small rise in concentrations during mid to late 2011, with concentrations now STABLE or DECLINING with concentration below early maximum but above 2010/2011. DECLINING					
	BH42a	Sludge Pit	Inside Green Fence	Sep. 2005 - Present	7	GRO	Records the highest GRO concentrations on site. Rise in concentration to a maximum in 2009, followed by a significant decline in concentrations. Concentrations now lower and **stable or declining.** **NO TREND OF CONCERN**	Monthly	DRO; GRO; SVOCs	QUARTERLY	No change proposed	Although concentrations remain high, concentrations have decreased during operational phase and are now STABLE or DECLINING
						DRO	Records highest DRO concentrations on site. Rise in concentrations to a maximum in 2009. Annual mean data confirm a decrease in concentration since 2009 with concentrations now lower and Sstable or declining. NO TREND OF CONCERN					
	BH43	Up-stream of Sludge Pit	Inside Green Fence	Jan. 2005 - Present	8	GRO	Elevated concentrations up to early 2008. Since when concentrations have been low and stable or declining. NO TREND OF CONCERN	Monthly	DRO; GRO; SVOCs	QUARTERLY	No change proposed	Significant decrease in concentrations observed during operational phase, with lower concentrations that are now STABLE or declining.
						DRO	Elevated and relatively stable concentrations from 2005 to 2010. Decrease in concentrations in 2011, with lower and generally stable concentrations in 2012 and 2013. NO TREND OF CONCERN					
	BH44	Down-stream of Sludge Pit	Inside Green Fence	Jan. 2005 - Present	8	GRO	Occasional occurrence in groundwater. Only two occurrence between 2007 and present day at historic low concentrations. NO TREND OF CONCERN	Quarterly	DRO; GRO.	SIX - MONTHLY	No change proposed	No trends of concern. Reduce monitoring frequency
						DRO	Occasional occurrence in groundwater (10% Samples). Only two occurrences in 2011 to present day at historically low concentrations. NO TREND OF CONCERN					
4. Valley Area Down-Stream of Skim Pond	MW03	-	Inside Green Fence	Jun. 2011 - Present	1.5	GRO	Short dataset. Low concentrations or absent. NO TREND OF CONCERN	Quarterly	DRO; GRO; SVOCs	No Change	DRO; GRO	No VOCs observed in RPS monitoring rounds
						DRO	Short dataset, with continuous presence of DRO at low concentration. NO TREND OF CONCERN					
	BH06	-	Inside Green Fence	Feb. 2005 - Present	8	GRO	Occasional presence in groundwater (7% of samples) at low concentrations. 2011 to 2012 only two occurrences of GRO, with concentrations below historical concentrations. NO TREND OF CONCERN	Quarterly	DRO; GRO.	SIX - MONTHLY	No change proposed	Due to low frequency of occurrence and low concentrations, move to six-monthly sampling.
						DRO	Present in only 27% samples analysed. In 2011-2012, occurs more routinely albeit with **STABLE** concentrations below high concentrations observed in 2005 & 2008. NO TREND OF CONCERN					
	BH34b	-	Inside Green Fence	Mar. 2008 - Present	5	GRO	GRO generally **DECLINING** although frequency of presence in groundwater is possibly increasing DECLINING	Monthly	DRO; GRO; SVOCs	QUARTERLY	No change proposed	Significant decrease on concentration from 2009 / 2010. With stable or declining trends.
						DRO	After a significant decrease in concentrations in 2009/2010, concentrations are now lower and declining. **DECLINING**					
	MW01	-	Inside Green Fence	Dec. 2009 - Present	3	GRO	Relatively short dataset but infrequent occurrence of GRO at low concentrations. NO TREND OF CONCERN	Quarterly	DRO; GRO; SVOCs	No Change	DRO; GRO	No VOCs observed in RPS monitoring rounds. Continue quarterly monitoring until we have x year dataset.
						DRO	Relatively short dataset but infrequent occurrence of DRO at low concentrations. NO TREND OF CONCERN					
5. Process Area	BH60b	-	Outside Green Fence	Mar. 2008 - Present	4.5	GRO	Occasional occurrence in groundwater (6 of 28 Samples) at low concentration. LOD not exceed since 2010. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	QUARTERLY	No change proposed	Demonstrate absence of DRO.
						DRO	Occasional occurrence in groundwater (4 of 28 Samples), with maximum concentration in 2009. Concentrations declined from 2009, now low or absent. NO TREND OF CONCERN					
	BH61a	-	Outside Green Fence	Sep. 2005 - Present	7	GRO	Variable concentrations in 2009 and 2010. Possible rising trend since mid 2010, but recent concentrations within historical variability. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	QUARTERLY	No change proposed	Continue to monitor trends in process area.
						DRO	Variable concentrations in 2009 and 2010. Possible RISING TREND from mid 2010 - present. Possible RISING TREND					

Appendix 8
Summary of Trend Analysis Recommendations

Borehole Group	Borehole ID	Position in Group	Location	Trend Analysis				Current Monitoring Regime		PROPOSED (Revised) MONITORING REGIME		
				Dataset Period	ca. Years	Parameter	Summary	Monitoring Frequency	Monitoring Suite	Monitoring Frequency	Monitoring Suite	Justification & Notes
6. Nature Conservation Area (NCA)	BH49	Southern NCA	Outside Green Fence	Jan. 2005 - Present	8	GRO	Generally absent. Low concentrations on two occasions. No Contamination present. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	-
						DRO	Infrequent occurrence in groundwater at low concentration. Anomalous occurrence in December 2012, but within historical variability. NO TREND OF CONCERN					
	BH50	Southern NCA	Outside Green Fence	Dec. 2004 - Present	8	GRO	Increase to maximum concentration in 2006 / 2007. Concentrations declined between 2007 to 2011. Possible RISING TREND in 2012 / 2013 although concentrations are highly variable and less than 2006/2007 maximum. Possible RISING TREND	Quarterly	DRO; GRO.	No change proposed	No change proposed	Continue to monitoring recent trends.
						DRO	General rise to maximum in 2006 / 2007. Declining concentrations to end of 2011, but possible increase RISING TREND in 2012 / 2011, albeit significantly below maximum concentrations in 2006/2007. Possible RISING TREND					
	BH53	Mid NCA	Outside Green Fence	Dec. 2004 - Present	8	GRO	Contamination historically dominated by GRO. General DECLINING trend since maximum in 2005 and now below or approaching LOD in 2011 to present day. DECLINING	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Demonstrate absence of DRO. Reconsider after trend analysis at end of 2013.
						DRO	DRO largely absent from groundwater. Single anomalously high concentration in December 2012. NO TREND OF CONCERN					
	BH20	Northern NCA	Outside Green Fence	Dec. 2004 - Present	8	GRO	Infrequent occurrence in groundwater (14% of Samples). Present at low concentration twice in 2012. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Continue to monitor for trends in DRO and PRO during 2013. Reconsider after trend analysis at end of 2013.
						DRO	Generally absent from groundwater between, with anomalously high concentration in December 2012 round. NO TREND OF CONCERN					
	BH22	Northern NCA	Outside Green Fence	Jan. 2005 - Present	8	GRO	Occurs very infrequently and low concentration in groundwater. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Continue to monitor for trends in DRO during 2013. Reconsider after trend analysis at end of 2013.
						DRO	Occasional presence in groundwater, typically at low concentration. Single anomalously high concentration in December 2012 monitoring round. NO TREND OF CONCERN					
7. High Ground to West of Skim Pond	BH47a	-	Outside Green Fence	Jan. 2005 - Present	8	GRO	Occasional occurrence in groundwater, with maximum in 2007 followed by decline. Since 2008 occurs infrequently at low concntration or absnet. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Continue to monitor for trends in DRO during 2013. Reconsider after trend analysis at end of 2013.
						DRO	Occasional occurrence in groundwater, with first appearance in 2009 at maximum concentration. General **decline** in subsequent rounds. Possible RISING TREND over last three rounds, with anomalous high in December 2012. Within historic variability. Possible RISING TREND					
8. Northern Site Boundary	BH26	-	Outside Green Fence	Jan. 2005 - Present	8	GRO	Occasional occurrence in groundwater at low concentration when present. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Continue to monitor for trends in DRO during 2013. Reconsider after trend analysis at end of 2013.
						DRO	Occasional occurrence in groundwater, typically at low concentration. Anomalously high concentration in December 2012 monitoring round (historical maximum). NO TREND OF CONCERN					
	BH27a	-	Outside Green Fence	Jan. 2005 - Present	8	GRO	Occasional occurrence in groundwater. Maximum in 2009, followed by low and STABLE concentration when present in groundwater. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	No trends of concern. Review at end of 2013.
						DRO	Occasional occurrence in groundwater. Generally STABLE when present. NO TREND OF CONCERN					
	BH55	-	Outside Green Fence	Dec. 2004 - Present	8	GRO	Very occasional occurrence in groundwater (2 of 29 Samples) at low concentration. NO TREND OF CONCERN	6-Monthly	DRO; GRO.	No change proposed	No change proposed	Demonstrate absence of DRO. Reconsider after trend analysis at end of 2013.
						DRO	General absence from groundwater, with exception of 2005 and 2012. Anomalously occurrence of DRO in December 2012 monitoring round. NO TREND OF CONCERN (verify spike)					

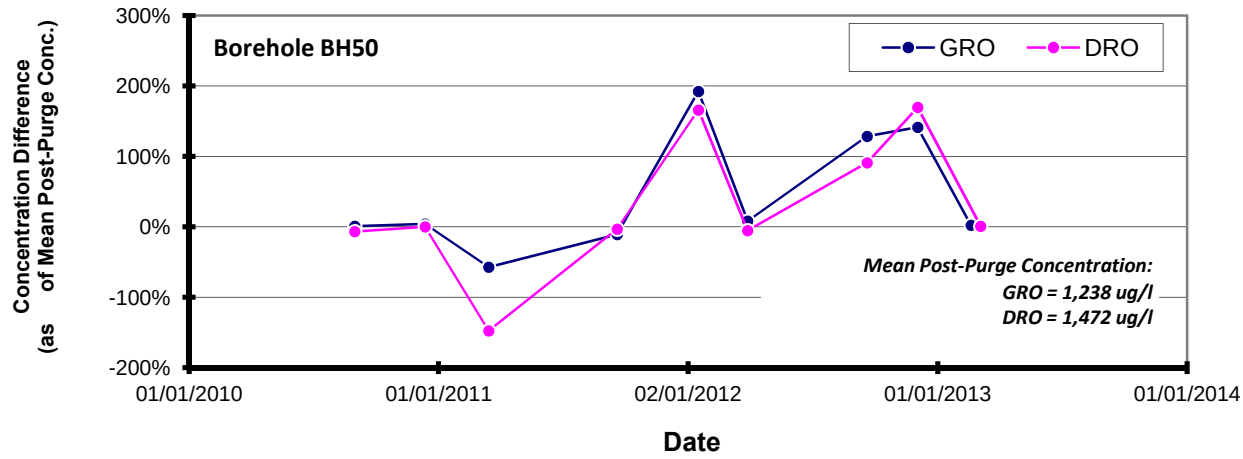
Appendix 9

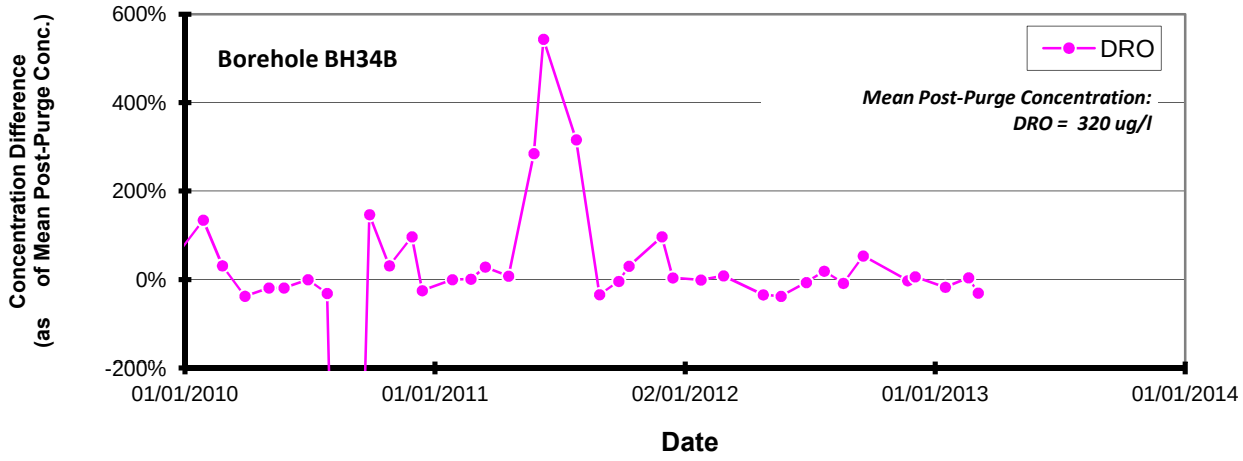
Purge versus No-Purge Sampling Assessment

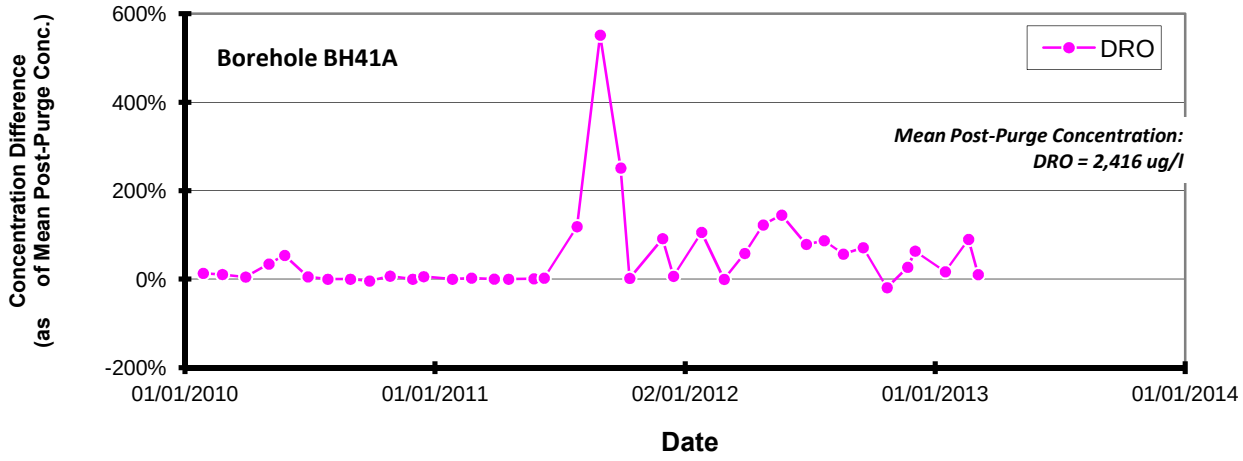
POST PURGED vs PRE-PURGE SAMPLES (NP)

Location	Sample Date	GRO >C5-C10				EPH Range >C10 - C40 (aq)			
		POST PURGE CONCENTRATION	PRE-PURGE CONCENTRATION	*Difference*	%'age Difference (Post vs Pre)	POST PURGE CONCENTRATION	PRE-PURGE CONCENTRATION	*Difference*	%'age Difference (Post vs Pre)
BH34B	24-Oct-12	<10	<10	*NONE*	NONE	70.1	64.2	*5.9*	8.4%
BH34B	23-Nov-12	<10	<10	*NONE*	NONE	52.8	60.8	*-8*	-15.2%
BH34B	06-Dec-12	<10	<10	*NONE*	NONE	92.1	71.9	*20.2*	21.9%
BH41A	24-Oct-12	<10	<10	*NONE*	NONE	790	1250	*-460*	-58.2%
BH41A	23-Nov-12	<10	<10	*NONE*	NONE	1060	409	*651*	61.4%
BH41A	07-Dec-12	<10	<10	*NONE*	NONE	1960	424	*1536*	78.4%
BH42A	24-Oct-12	355	672	*-317*	-89.3%	50400	21800	*28600*	56.7%
BH42A	23-Nov-12	38	254	*-216*	-568.4%	20200	27900	*-7700*	-38.1%
BH42A	07-Dec-12	237	121	*116*	48.9%	3660	3490	*170*	4.6%
BH43	24-Oct-12	32	29	*3*	9.4%	185	172	*13*	7.0%
BH43	23-Nov-12	25	15	*10*	40.0%	154	104	*50*	32.5%
BH43	07-Dec-12	50	32	*18*	36.0%	419	505	*-86*	-20.5%
MW1	06-Dec-12	<10	<10	*NONE*	NONE	<46	48.1	-	-
MW3	06-Dec-12	<10	<10	*NONE*	NONE	179	213	*-34*	-19.0%
BH06	06-Dec-12	<10	<10	*NONE*	NONE	90.2	93.5	*-3.3*	-3.7%
BH44	06-Dec-12	<10	<10	*NONE*	NONE	<46	<46	-	NONE
BH50	05-Dec-12	1750	<10	-	-	2720	224	*2496*	91.8%
BH01	05-Dec-12	<10	<10	*NONE*	NONE	135	163	*-28*	-20.7%
BH18	04-Dec-12	<10	<10	*NONE*	NONE	208	398	*-190*	-91.3%
BH19	05-Dec-12	<10	<10	*NONE*	NONE	94.2	107	*-12.8*	-13.6%
BH20	03-Dec-12	21	<10	*NONE*	NONE	582	-	-	-
BH22	03-Dec-12	<10	22	*NONE*	NONE	323	376	*-53*	-16.4%
BH26	03-Dec-12	<10	<10	*NONE*	NONE	212	281	*-69*	-32.5%
BH27A	04-Dec-12	12	<10	-	-	225	439	*-214*	-95.1%
BH30a	07-Dec-12	<10	<10	*NONE*	NONE	<46	<46	-	NONE
BH36B	04-Dec-12	<10	<10	*NONE*	NONE	252	202	*50*	19.8%
BH40A	06-Dec-12	<10	<10	*NONE*	NONE	6150	561	*5589*	90.9%
BH45B	07-Dec-12	<10	<10	*NONE*	NONE	224	210	*14*	6.3%
BH47A	04-Dec-12	<10	<10	*NONE*	NONE	283	278	*5*	1.8%
BH49	05-Dec-12	<10	<10	*NONE*	NONE	214	312	*-98*	-45.8%
BH53	03-Dec-12	20	18	*2*	10.0%	664	324	*340*	51.2%
BH55	04-Dec-12	<10	<10	*NONE*	NONE	277	214	*63*	22.7%
BH59	04-Dec-12	<10	<10	*NONE*	NONE	183	209	*-26*	-14.2%
BH60b	05-Dec-12	<10	<10	*NONE*	NONE	132	220	*-88*	-66.7%
BH61a	05-Dec-12	823	674	*149*	18.1%	1690	1660	*30*	1.8%
BH63a	06-Dec-12	<10	<10	*NONE*	NONE	<46	<46	*NONE*	NONE
BH65	05-Dec-12	<10	<10	*NONE*	NONE	182	196	*-14*	-7.7%
BHG2b	07-Dec-12	<10	<10	*NONE*	NONE	<46	51.8	-	-
MIN									-95.1%
MAX									91.8%
AVERAGE									-0.05%

Pre-Purge versus Post-Purged Sample Concentrations

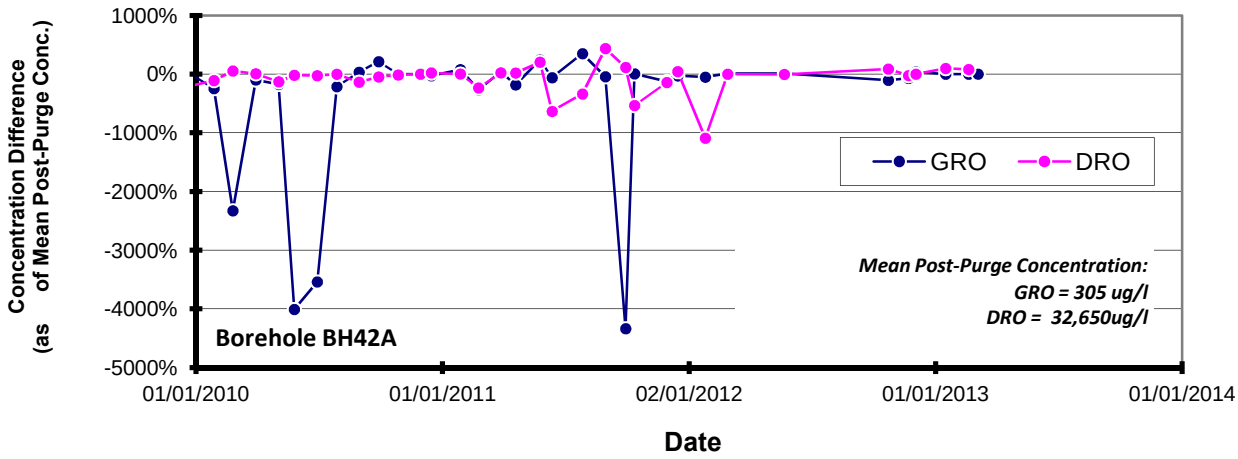


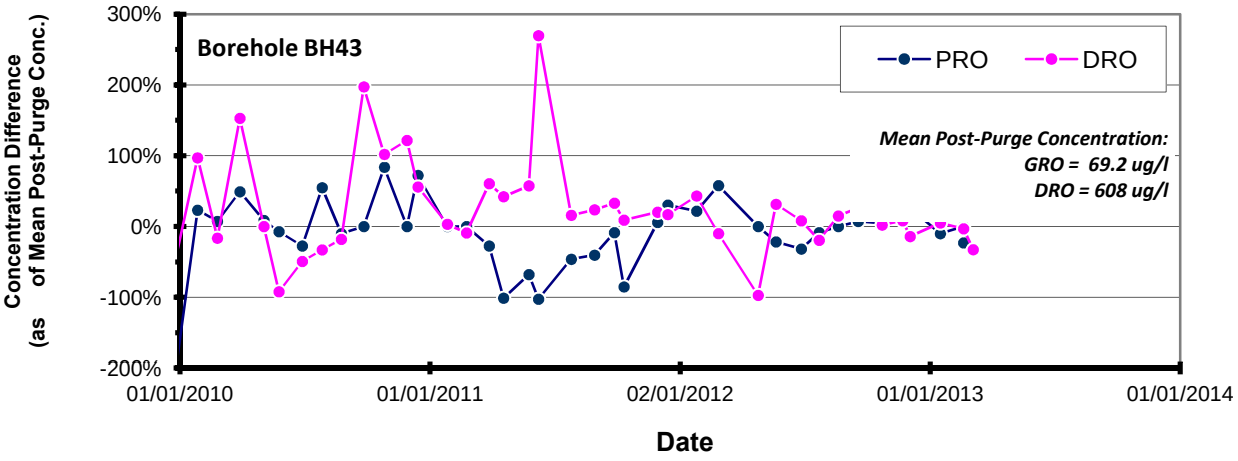


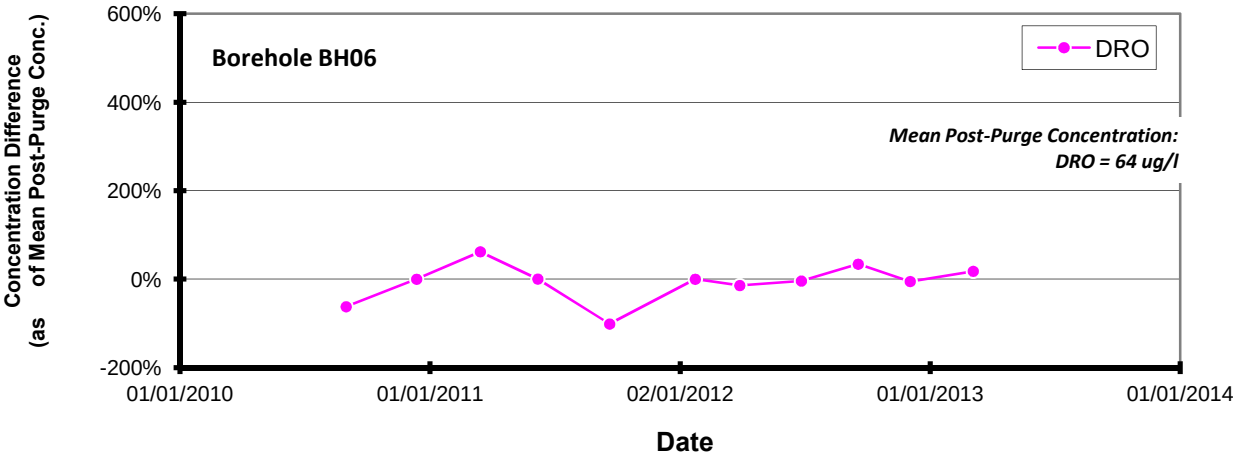


NOTE: The "*Concentration Difference*" on the charts above is presented as the difference in pre- and post-purge sample concentrations for that location (i.e. post-purge minus pre-purge) as a percentage of the "mean purge concentration" for the entire pre- and post-purge dataset (for samples with conctrations above the LOD).

Pre-Purge versus Post-Purged Sample Concentrations

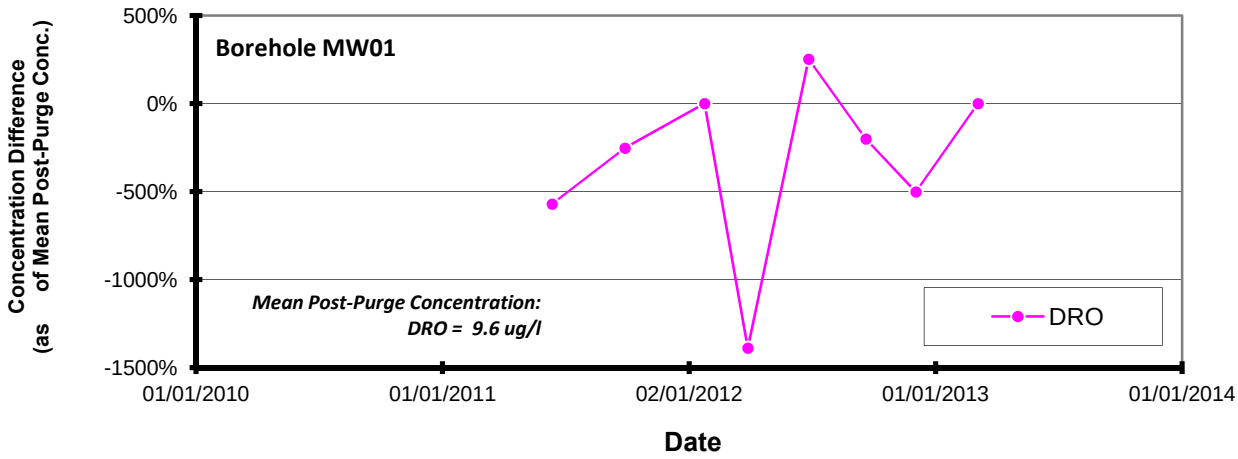




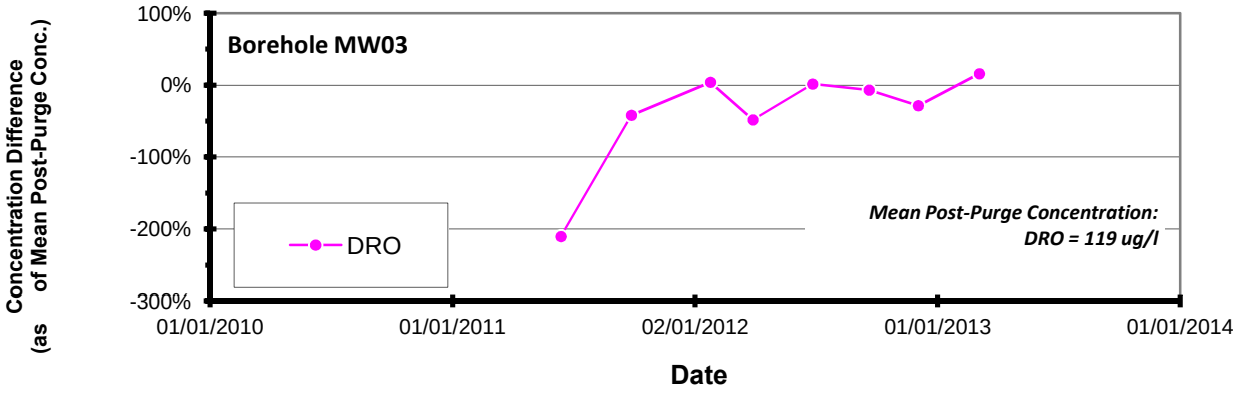


NOTE: The "*Concentration Difference*" on the charts above is presented as the difference in pre- and post-purge sample concentrations for that location (i.e. post-purge minus pre-purge) as a percentage of the "mean purge concentration" for the entire pre- and post-purge dataset (for samples with conctrations above the LOD).

Pre-Purge versus Post-Purged Sample Concentrations



DRO



NOTE: The "*Concentration Difference*" on the charts above is presented as the difference in pre- and post-purge sample concentrations for that location (i.e. post-purge minus pre-purge) as a percentage of the "mean purge concentration" for the entire pre- and post-purge dataset (for samples with conctrations above the LOD).

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference (Dif) (Purge-NP)	Mean Purged Conc. (MPC)	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH50	PRO	01/09/2010	2010	950	950	940	940	ug/l	10	1238.4	0.8%
BH50	PRO	13/12/2010	2010	430	430	380	380	ug/l	50	1238.4	4.0%
BH50	PRO	16/03/2011	2011	1410	1410	2120	2120	ug/l	-710	1238.4	-57.3%
BH50	PRO	20/09/2011	2011	724	724	860	860	ug/l	-136	1238.4	-11.0%
BH50	PRO	17/01/2012	2012	2390	2390	10	10	ug/l	2380	1238.4	192.2%
BH50	PRO	29/03/2012	2012	1810	1810	1710	1710	ug/l	100	1238.4	8.1%
BH50	PRO	20/09/2012	2012	1590	1590	<10	0	ug/l	1590	1238.4	128.4%
BH50	PRO	03/12/2012	2012	1750	1750	<10	0	ug/l	1750	1238.4	141.3%
BH50	PRO	19/02/2013	2013	92	92	65	65	ug/l	27	1238.4	2.2%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference (Dif)	Mean Purged Conc. (MPC)	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
MW01	PRO	13/06/2011	2011	<10	0	<10	0	ug/l	0	2.5	0.0%
MW01	PRO	29/09/2011	2011	<10	0	<10	0	ug/l	0	2.5	0.0%
MW01	PRO	25/01/2012	2012	10	10	10	10	ug/l	0	2.5	0.0%
MW01	PRO	29/03/2012	2012	10	10	10	10	ug/l	0	2.5	0.0%
MW01	PRO	27/06/2012	2012	<10	0	<10	0	ug/l	0	2.5	0.0%
MW01	PRO	20/09/2012	2012	<10	0	<10	0	ug/l	0	2.5	0.0%
MW01	PRO	03/12/2012	2012	<10	0	<10	0	ug/l	0	2.5	0.0%
MW01	PRO	19/02/2013	2013	<10	0	<10	0	ug/l	0	2.5	0.0%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference (Dif)	Mean Purged Conc. (MPC)	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
MW03	PRO	14/06/2011	2011	<10	0	<10	0	ug/l	0	4.3	0.0%
MW03	PRO	28/09/2011	2011	<10	0	<10	0	ug/l	0	4.3	0.0%
MW03	PRO	25/01/2012	2012	10	10	10	10	ug/l	0	4.3	0.0%
MW03	PRO	29/03/2012	2012	10	10	10	10	ug/l	0	4.3	0.0%
MW03	PRO	27/06/2012	2012	<10	0	<10	0	ug/l	0	4.3	0.0%
MW03	PRO	20/09/2012	2012	<10	0	<10	0	ug/l	0	4.3	0.0%
MW03	PRO	03/12/2012	2012	<10	0	<10	0	ug/l	0	4.3	0.0%
MW03	PRO	19/02/2013	2013	14	14	11	11	ug/l	3	4.3	70.6%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference (Dif)	Mean Purged Conc. (MPC)	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH44	PRO	27/09/2010	2010	<30	0	<30	0	ug/l	0	1.8	0.0%
BH44	PRO	15/12/2010	2010	<30	0	<30	0	ug/l	0	1.8	0.0%
BH44	PRO	16/03/2011	2011	<10	0	<10	0	ug/l	0	1.8	0.0%
BH44	PRO	09/06/2011	2011	<10	0	<10	0	ug/l	0	1.8	0.0%
BH44	PRO	27/09/2011	2011	<10	0	<10	0	ug/l	0	1.8	0.0%
BH44	PRO	24/01/2012	2012	10	10	10	10	ug/l	0	1.8	0.0%
BH44	PRO	29/03/2012	2012	10	10	10	10	ug/l	0	1.8	0.0%
BH44	PRO	27/06/2012	2012	<10	0	<10	0	ug/l	0	1.8	0.0%
BH44	PRO	18/09/2012	2012	<10	0	<10	0	ug/l	0	1.8	0.0%
BH44	PRO	03/12/2012	2012	<10	0	<10	0	ug/l	0	1.8	0.0%
BH44	PRO	19/02/2013	2013	<10	0	<10	0	ug/l	0	1.8	0.0%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference (Dif)	Mean Purged Conc. (MPC)	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH06	PRO	01/09/2010	2010	<30	0	<30	0	ug/l	0	1.8	0.0%
BH06	PRO	13/12/2010	2010	<30	0	<30	0	ug/l	0	1.8	0.0%
BH06	PRO	16/03/2011	2011	<10	0	<10	0	ug/l	0	1.8	0.0%
BH06	PRO	08/06/2011	2011	<10	0	<10	0	ug/l	0	1.8	0.0%
BH06	PRO	21/09/2011	2011	<10	0	<10	0	ug/l	0	1.8	0.0%
BH06	PRO	24/01/2012	2012	10	10	10	10	ug/l	0	1.8	0.0%
BH06	PRO	29/03/2012	2012	10	10	10	10	ug/l	0	1.8	0.0%
BH06	PRO	27/06/2012	2012	<10	0	<10	0	ug/l	0	1.8	0.0%
BH06	PRO	18/09/2012	2012	<10	0	<10	0	ug/l	0	1.8	0.0%
BH06	PRO	03/12/2012	2012	<10	0	<10	0	ug/l	0	1.8	0.0%
BH06	PRO	19/02/2013	2013	<10	0	<10	0	ug/l	0	1.8	0.0%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference (Dif)	Mean Purged Conc.	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH50	DRO	01/09/2010	2010	1200	1200	1300	1300	ug/l	-100	1472.0	-6.8%
BH50	DRO	13/12/2010	2010	560	560	560	560	ug/l	0	1472.0	0.0%
BH50	DRO	16/03/2011	2011	893	893	3070	3070	ug/l	-2177	1472.0	-147.9%
BH50	DRO	20/09/2011	2011	1030	1030	1080	1080	ug/l	-50	1472.0	-3.4%
BH50	DRO	17/01/2012	2012	2550	2550	112	112	ug/l	2438	1472.0	165.6%
BH50	DRO	29/03/2012	2012	2540	2540	2620	2620	ug/l	-80	1472.0	-5.4%
BH50	DRO	20/09/2012	2012	1410	1410	72.4	72.4	ug/l	1337.6	1472.0	90.9%
BH50	DRO	03/12/2012	2012	2720	2720	224	224	ug/l	2496	1472.0	169.6%
BH50	DRO	05/03/2013	2013	345	345	335	335	ug/l	10	1472.0	0.7%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference	Mean Purged	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
MW01	DRO	13/06/2011	2011	32.5	32.5	87.2	87.2	ug/l	-54.7	9.6	-571.3%
MW01	DRO	29/09/2011	2011	<10	0	24.3	24.3	ug/l	-24.3	9.6	-253.8%
MW01	DRO	25/01/2012	2012	10	10	10	10	ug/l	0	9.6	0.0%
MW01	DRO	29/03/2012	2012	10	10	143	143	ug/l	-133	9.6	-1389.0%
MW01	DRO	27/06/2012	2012	24.1	24.1	<10	0	ug/l	24.1	9.6	251.7%
MW01	DRO	20/09/2012	2012	<10	0	19.3	19.3	ug/l	-19.3	9.6	-201.6%
MW01	DRO	03/12/2012	2012	<46	0	48.1	48.1	ug/l	-48.1	9.6	-502.3%
MW01	DRO	05/03/2013	2013	<46	0	<46	0	ug/l	0	9.6	0.0%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference	Mean Purged	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
MW03	DRO	14/06/2011	2011	214	214	465	465	ug/l	-251	119.4	-210.2%
MW03	DRO	28/09/2011	2011	53.1	53.1	103	103	ug/l	-49.9	119.4	-41.8%
MW03	DRO	25/01/2012	2012	77.1	77.1	72.3	72.3	ug/l	4.8	119.4	4.0%
MW03	DRO	29/03/2012	2012	93.5	93.5	151	151	ug/l	-57.5	119.4	-48.2%
MW03	DRO	27/06/2012	2012	86.6	86.6	84.8	84.8	ug/l	1.8	119.4	1.5%
MW03	DRO	20/09/2012	2012	81.9	81.9	90.1	90.1	ug/l	-8.2	119.4	-6.9%
MW03	DRO	03/12/2012	2012	179	179	213	213	ug/l	-34	119.4	-28.5%
MW03	DRO	05/03/2013	2013	170	170	151	151	ug/l	19	119.4	15.9%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference	Mean Purged	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH44	DRO	27/09/2010	2010	230	230	220	220	ug/l	10	27.5	36.4%
BH44	DRO	15/12/2010	2010	<100	0	<100	0	ug/l	0	27.5	0.0%
BH44	DRO	16/03/2011	2011	<10	0	<10	0	ug/l	0	27.5	0.0%
BH44	DRO	09/06/2011	2011	<10	0	<10	0	ug/l	0	27.5	0.0%
BH44	DRO	27/09/2011	2011	<10	0	<10	0	ug/l	0	27.5	0.0%
BH44	DRO	24/01/2012	2012	10	10	10	10	ug/l	0	27.5	0.0%
BH44	DRO	29/03/2012	2012	10	10	10	10	ug/l	0	27.5	0.0%
BH44	DRO	27/06/2012	2012	<10	0	<10	0	ug/l	0	27.5	0.0%
BH44	DRO	18/09/2012	2012	<10	0	<10	0	ug/l	0	27.5	0.0%
BH44	DRO	03/12/2012	2012	<46	0	<46	0	ug/l	0	27.5	0.0%
BH44	DRO	05/03/2013	2013	52	52	<46	0	ug/l	52	27.5	189.4%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference	Mean Purged	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH06	DRO	01/09/2010	2010	190	190	230	230	ug/l	-40	64.4	-62.1%
BH06	DRO	13/12/2010	2010	<100	0	<100	0	ug/l	0	64.4	0.0%
BH06	DRO	16/03/2011	2011	40	40	<10	0	ug/l	40	64.4	62.1%
BH06	DRO	08/06/2011	2011	67.1	67.1	66.8	66.8	ug/l	0.3	64.4	0.5%
BH06	DRO	21/09/2011	2011	58.8	58.8	124	124	ug/l	-65.2	64.4	-101.3%
BH06	DRO	24/01/2012	2012	10	10	10	10	ug/l	0	64.4	0.0%
BH06	DRO	29/03/2012	2012	73.8	73.8	83	83	ug/l	-9.2	64.4	-14.3%
BH06	DRO	27/06/2012	2012	61.2	61.2	63.8	63.8	ug/l	-2.6	64.4	-4.0%
BH06	DRO	18/09/2012	2012	39.3	39.3	17.4	17.4	ug/l	21.9	64.4	34.0%
BH06	DRO	03/12/2012	2012	90.2	90.2	93.5	93.5	ug/l	-3.3	64.4	-5.1%
BH06	DRO	05/03/2013	2013	77.8	77.8	66.2	66.2	ug/l	11.6	64.4	18.0%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference (Dif)	Mean Purged Conc. (MPC)	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH42A	PRO	16/12/2009	2009	620	620	440	440	ug/l	180	305.1	59.0%
BH42A	PRO	28/01/2010	2010	63	63	810	810	ug/l	-747	305.1	-244.8%
BH42A	PRO	25/02/2010	2010	<30	0	7100	7100	ug/l	-7100	305.1	-2327.0%
BH42A	PRO	31/03/2010	2010	<30	0	300	300	ug/l	-300	305.1	-98.3%
BH42A	PRO	04/05/2010	2010	<30	0	530	530	ug/l	-530	305.1	-173.7%
BH42A	PRO	27/05/2010	2010	770	770	13000	13000	ug/l	-12230	305.1	-4008.3%
BH42A	PRO	30/06/2010	2010	200	200	11000	11000	ug/l	-10800	305.1	-3539.6%
BH42A	PRO	29/07/2010	2010	140	140	790	790	ug/l	-650	305.1	-213.0%
BH42A	PRO	31/08/2010	2010	140	140	35	35	ug/l	105	305.1	34.4%
BH42A	PRO	29/09/2010	2010	1100	1100	450	450	ug/l	650	305.1	213.0%
BH42A	PRO	28/10/2010	2010	120	120	120	120	ug/l	0	305.1	0.0%
BH42A	PRO	30/11/2010	2010	210	210	210	210	ug/l	0	305.1	0.0%
BH42A	PRO	16/12/2010	2010	260	260	340	340	ug/l	-80	305.1	-26.2%
BH42A	PRO	28/01/2011	2011	650	650	410	410	ug/l	240	305.1	78.7%
BH42A	PRO	24/02/2011	2011	1050	1050	1860	1860	ug/l	-810	305.1	-265.5%
BH42A	PRO	29/03/2011	2011	320	320	197	197	ug/l	123	305.1	40.3%
BH42A	PRO	20/04/2011	2011	139	139	695	695	ug/l	-556	305.1	-182.2%
BH42A	PRO	26/05/2011	2011	826	826	83	83	ug/l	743	305.1	243.5%
BH42A	PRO	13/06/2011	2011	398	398	582	582	ug/l	-184	305.1	-60.3%
BH42A	PRO	28/07/2011	2011	1390	1390	325	325	ug/l	1065	305.1	349.0%
BH42A	PRO	31/08/2011	2011	236	236	367	367	ug/l	-131	305.1	-42.9%
BH42A	PRO	30/09/2011	2011	467	467	13700	13700	ug/l	-13233	305.1	-4337.0%
BH42A	PRO	13/10/2011	2011	110	110	89	89	ug/l	21	305.1	6.9%
BH42A	PRO	30/11/2011	2011	26	26	402	402	ug/l	-376	305.1	-123.2%
BH42A	PRO	16/12/2011	2011	230	230	318	318	ug/l	-88	305.1	-28.8%
BH42A	PRO	26/01/2012	2012	26	26	179	179	ug/l	-153	305.1	-50.1%
BH42A	PRO	28/02/2012	2012	101	101	72	72	ug/l	29	305.1	9.5%
BH42A	PRO	22/05/2012	2012	49	49	10	10	ug/l	39	305.1	12.8%
BH42A	PRO	23/10/2012	2012	355	355	672	672	ug/l	-317	305.1	-103.9%
BH42A	PRO	22/11/2012	2012	38	38	254	254	ug/l	-216	305.1	-70.8%
BH42A	PRO	03/12/2012	2012	237	237	121	121	ug/l	116	305.1	38.0%
BH42A	PRO	16/01/2013	2013	81	81	76	76	ug/l	5	305.1	1.6%
BH42a	PRO	19/02/2013	2013	79	0	86	0	ug/l	0	305.1	0.0%
BH42A	PRO	05/03/2013	2013	22	22	16	16	ug/l	6	305.1	2.0%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference	Mean Purged	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH42A	DRO	16/12/2009	2009	21000	21000	93000	93000	ug/l	-72000	32649.3	-220.5%
BH42A	DRO	28/01/2010	2010	65000	65000	100000	100000	ug/l	-35000	32649.3	-107.2%
BH42A	DRO	25/02/2010	2010	29000	29000	11000	11000	ug/l	18000	32649.3	55.1%
BH42A	DRO	31/03/2010	2010	7000	7000	4200	4200	ug/l	2800	32649.3	8.6%
BH42A	DRO	04/05/2010	2010	20000	20000	62000	62000	ug/l	-42000	32649.3	-128.6%
BH42A	DRO	27/05/2010	2010	21000	21000	27000	27000	ug/l	-6000	32649.3	-18.4%
BH42A	DRO	30/06/2010	2010	25000	25000	33000	33000	ug/l	-8000	32649.3	-24.5%
BH42A	DRO	29/07/2010	2010	1400	1400	1700	1700	ug/l	-300	32649.3	-0.9%
BH42A	DRO	31/08/2010	2010	56000	56000	100000	100000	ug/l	-44000	32649.3	-134.8%
BH42A	DRO	29/09/2010	2010	8800	8800	24000	24000	ug/l	-15200	32649.3	-46.6%
BH42A	DRO	28/10/2010	2010	6700	6700	11000	11000	ug/l	-4300	32649.3	-13.2%
BH42A	DRO	30/11/2010	2010	3200	3200	2700	2700	ug/l	500	32649.3	1.5%
BH42A	DRO	16/12/2010	2010	15000	15000	7900	7900	ug/l	7100	32649.3	21.7%
BH42A	DRO	28/01/2011	2011	19000	19000	18000	18000	ug/l	1000	32649.3	3.1%
BH42A	DRO	24/02/2011	2011	19600	19600	95900	95900	ug/l	-76300	32649.3	-233.7%
BH42A	DRO	29/03/2011	2011	16900	16900	9080	9080	ug/l	7820	32649.3	24.0%
BH42A	DRO	20/04/2011	2011	6740	6740	206	206	ug/l	6534	32649.3	20.0%
BH42A	DRO	26/05/2011	2011	140000	140000	73100	73100	ug/l	66900	32649.3	204.9%
BH42A	DRO	13/06/2011	2011	36800	36800	244000	244000	ug/l	-207200	32649.3	-634.6%
BH42A	DRO	28/07/2011	2011	32600	32600	143000	143000	ug/l	-110400	32649.3	-338.1%
BH42A	DRO	31/08/2011	2011	252000	252000	109000	109000	ug/l	143000	32649.3	438.0%
BH42A	DRO	30/09/2011	2011	55500	55500	17500	17500	ug/l	38000	32649.3	116.4%
BH42A	DRO	13/10/2011	2011	6070	6070	180000	180000	ug/l	-173930	32649.3	-532.7%
BH42A	DRO	30/11/2011	2011	25000	25000	71400	71400	ug/l	-46400	32649.3	-142.1%
BH42A	DRO	16/12/2011	2011	25400	25400	10700	10700	ug/l	14700	32649.3	45.0%
BH42A	DRO	26/01/2012	2012	32300	32300	388000	388000	ug/l	-355700	32649.3	-1089.5%
BH42A	DRO	28/02/2012	2012	3170	3170	2650	2650	ug/l	520	32649.3	1.6%
BH42A	DRO	22/05/2012	2012	737	737	1660	1660	ug/l	-923	32649.3	-2.8%
BH42A	DRO	23/10/2012	2012	50400	50400	21800	21800	ug/l	28600	32649.3	87.6%
BH42A	DRO	22/11/2012	2012	20200	20200	27900	27900	ug/l	-7700	32649.3	-23.6%
BH42A	DRO	03/12/2012	2012	3660	3660	3490	3490	ug/l	170	32649.3	0.5%
BH42A	DRO	16/01/2013	2013	35400	35400	3640	3640	ug/l	31760	32649.3	97.3%
BH42a	DRO	19/02/2013	2013	30000	30000	3700	3700	ug/l	26300	32649.3	80.6%
BH42A	DRO	05/03/2013	2013	19500	19500	7260	7260	ug/l			

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference (Dif)	Mean Purged Conc. (MPC)	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH43	PRO	16/12/2009	2009	<30	0	190	190	ug/l	-190	69.2	-274.6%
BH43	PRO	27/01/2010	2010	64	64	48	48	ug/l	16	69.2	23.1%
BH43	PRO	25/02/2010	2010	44	44	39	39	ug/l	5	69.2	7.2%
BH43	PRO	30/03/2010	2010	34	34	<30	0	ug/l	34	69.2	49.1%
BH43	PRO	04/05/2010	2010	76	76	70	70	ug/l	6	69.2	8.7%
BH43	PRO	26/05/2010	2010	65	65	70	70	ug/l	-5	69.2	-7.2%
BH43	PRO	29/06/2010	2010	56	56	75	75	ug/l	-19	69.2	-27.5%
BH43	PRO	28/07/2010	2010	80	80	42	42	ug/l	38	69.2	54.9%
BH43	PRO	25/08/2010	2010	44	44	51	51	ug/l	-7	69.2	-10.1%
BH43	PRO	27/09/2010	2010	<30	0	<30	0	ug/l	0	69.2	0.0%
BH43	PRO	27/10/2010	2010	58	58	<30	0	ug/l	58	69.2	83.8%
BH43	PRO	29/11/2010	2010	<30	0	<30	0	ug/l	0	69.2	0.0%
BH43	PRO	15/12/2010	2010	200	200	150	150	ug/l	50	69.2	72.3%
BH43	PRO	27/01/2011	2011	<30	0	<30	0	ug/l	0	69.2	0.0%
BH43	PRO	24/02/2011	2011	<10	0	<10	0	ug/l	0	69.2	0.0%
BH43	PRO	29/03/2011	2011	49	49	68	68	ug/l	-19	69.2	-27.5%
BH43	PRO	19/04/2011	2011	1100	1100	1170	1170	ug/l	-70	69.2	-101.2%
BH43	PRO	26/05/2011	2011	32	32	79	79	ug/l	-47	69.2	-67.9%
BH43	PRO	09/06/2011	2011	<10	0	71	71	ug/l	-71	69.2	-102.6%
BH43	PRO	27/07/2011	2011	17	17	49	49	ug/l	-32	69.2	-46.2%
BH43	PRO	30/08/2011	2011	22	22	50	50	ug/l	-28	69.2	-40.5%
BH43	PRO	28/09/2011	2011	35	35	41	41	ug/l	-6	69.2	-8.7%
BH43	PRO	12/10/2011	2011	58	58	117	117	ug/l	-59	69.2	-85.3%
BH43	PRO	30/11/2011	2011	42	42	38	38	ug/l	4	69.2	5.8%
BH43	PRO	15/12/2011	2011	21	21	<10	0	ug/l	21	69.2	30.3%
BH43	PRO	26/01/2012	2012	46	46	31	31	ug/l	15	69.2	21.7%
BH43	PRO	27/02/2012	2012	111	111	71	71	ug/l	40	69.2	57.8%
BH43	PRO	25/04/2012	2012	46	46	46	46	ug/l	0	69.2	0.0%
BH43	PRO	21/05/2012	2012	61	61	76	76	ug/l	-15	69.2	-21.7%
BH43	PRO	27/06/2012	2012	39	39	61	61	ug/l	-22	69.2	-31.8%
BH43	PRO	23/07/2012	2012	47	47	53	53	ug/l	-6	69.2	-8.7%
BH43	PRO	20/08/2012	2012	45	45	45	45	ug/l	0	69.2	0.0%
BH43	PRO	20/08/2012	2012	45	45	45	45	ug/l	0	69.2	0.0%
BH43	PRO	18/09/2012	2012	29	29	24	24	ug/l	5	69.2	7.2%
BH43	PRO	23/10/2012	2012	32	32	29	29	ug/l	3	69.2	4.3%
BH43	PRO	22/11/2012	2012	25	25	15	15	ug/l	10	69.2	14.5%
BH43	PRO	03/12/2012	2012	50	50	32	32	ug/l	18	69.2	26.0%
BH43	PRO	16/01/2013	2013	39	39	46	46	ug/l	-7	69.2	-10.1%
BH43	PRO	19/02/2013	2013	<10	0	32	0	ug/l	0	69.2	0.0%
BH43	PRO	19/02/2013	2013	56	56	72	72	ug/l	-16	69.2	-23.1%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference	Mean Purged	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH43	DRO	16/12/2009	2009	<100	0	550	550	ug/l	-550	608.0	-90.5%
BH43	DRO	27/01/2010	2010	1200	1200	610	610	ug/l	590	608.0	97.0%
BH43	DRO	25/02/2010	2010	1200	1200	1300	1300	ug/l	-100	608.0	-16.4%
BH43	DRO	30/03/2010	2010	1400	1400	470	470	ug/l	930	608.0	153.0%
BH43	DRO	04/05/2010	2010	1500	1500	1500	1500	ug/l	0	608.0	0.0%
BH43	DRO	26/05/2010	2010	940	940	1500	1500	ug/l	-560	608.0	-92.1%
BH43	DRO	29/06/2010	2010	1700	1700	2000	2000	ug/l	-300	608.0	-49.3%
BH43	DRO	28/07/2010	2010	<100	0	200	200	ug/l	-200	608.0	-32.9%
BH43	DRO	25/08/2010	2010	<100	0	110	110	ug/l	-110	608.0	-18.1%
BH43	DRO	27/09/2010	2010	3300	3300	2100	2100	ug/l	1200	608.0	197.4%
BH43	DRO	27/10/2010	2010	940	940	320	320	ug/l	620	608.0	102.0%
BH43	DRO	29/11/2010	2010	740	740	<100	0	ug/l	740	608.0	121.7%
BH43	DRO	15/12/2010	2010	340	340	<100	0	ug/l	340	608.0	55.9%
BH43	DRO	27/01/2011	2011	130	130	110	110	ug/l	20	608.0	3.3%
BH43	DRO	24/02/2011	2011	91.9	91.9	147	147	ug/l	-55.1	608.0	-9.1%
BH43	DRO	29/03/2011	2011	754	754	386	386	ug/l	368	608.0	60.5%
BH43	DRO	19/04/2011	2011	340	340	83.5	83.5	ug/l	256.5	608.0	42.2%
BH43	DRO	26/05/2011	2011	1380	1380	1030	1030	ug/l	350	608.0	57.6%
BH43	DRO	09/06/2011	2011	2080	2080	440	440	ug/l	1640	608.0	269.7%
BH43	DRO	27/07/2011	2011	406	406	309	309	ug/l	97	608.0	16.0%
BH43	DRO	30/08/2011	2011	286	286	142	142	ug/l	144	608.0	23.7%
BH43	DRO	28/09/2011	2011	424	424	223	223	ug/l	201	608.0	33.1%
BH43	DRO	12/10/2011	2011	185	185	130	130	ug/l	55	608.0	9.0%
BH43	DRO	30/11/2011	2011	394	394	271	271	ug/l	123	608.0	20.2%
BH43	DRO	15/12/2011	2011	103	103	<10	0	ug/l	103	608.0	16.9%
BH43	DRO	26/01/2012	2012	293	293	30.5	30.5	ug/l	262.5	608.0	43.2%
BH43	DRO	27/02/2012	2012	148	148	209	209	ug/l	-61	608.0	-10.0%
BH43	DRO	25/04/2012	2012	439	439	1030	1030	ug/l	-591	608.0	-97.2%
BH43	DRO	21/05/2012	2012	252	252	60.9	60.9	ug/l	191.1	608.0	31.4%
BH43	DRO	27/06/2012	2012	316	316	266	266	ug/l	50	608.0	8.2%
BH43	DRO	23/07/2012	2012	355	355	473	473	ug/l	-118	608.0	-19.4%
BH43	DRO	20/08/2012	2012	329	329	238	238	ug/l	91	608.0	15.0%
BH43	DRO	20/08/2012	2012	329	329	238	238	ug/l	91	608.0	15.0%
BH43	DRO	18/09/2012	2012	270	270	110	110	ug/l	160	608.0	26.3%
BH43	DRO	23/10/2012	2012	185	185	172	172	ug/l	13	608.0	2.1%
BH43	DRO	22/11/2012	2012	154	154	104	104	ug/l	50	608.0	8.2%
BH43	DRO	03/12/2012	2012	419	419	505	505	ug/l	-86	608.0	-14.1%
BH43	DRO	16/01/2013	2013	469	469	438	438	ug/l	31	608.0	5.1%
BH43	DRO	19/02/2013	2013	259	259	278	278	ug/l	-19	608.0	-3.1%
BH43	DRO	05/03/2013	2013	270	270	469	469	ug/l	-199	608.0	-32.7%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference (Dif)	Mean Purged Conc. (MPC)	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH41A	PRO	16/12/2009	2009	520	520	250	250	ug/l	270	21.1	1278.3%
BH41A	PRO	28/01/2010	2010	61	61	<30	0	ug/l	61	21.1	288.8%
BH41A	PRO	25/02/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	31/03/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	04/05/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	27/05/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	30/06/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	29/07/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	31/08/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	28/09/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	28/10/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	30/11/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	16/12/2010	2010	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	27/01/2011	2011	<30	0	<30	0	ug/l	0	21.1	0.0%
BH41A	PRO	24/02/2011	2011	<10	0	<10	0	ug/l	0	21.1	0.0%
BH41A	PRO	29/03/2011	2011	<10	0	<10	0	ug/l	0	21.1	0.0%
BH41A	PRO	19/04/2011	2011	<50	0	<50	0	ug/l	0	21.1	0.0%
BH41A	PRO	26/05/2011	2011	<10	0	<10	0	ug/l	0	21.1	0.0%
BH41A	PRO	10/06/2011	2011	<10	0	<10	0	ug/l	0	21.1	0.0%
BH41A	PRO	28/07/2011	2011	<10	0	38	38	ug/l	-38	21.1	-179.9%
BH41A	PRO	31/08/2011	2011	19	19	10	10	ug/l	9	21.1	42.6%
BH41A	PRO	30/09/2011	2011	35	35	29	29	ug/l	6	21.1	28.4%
BH41A	PRO	13/10/2011	2011	<10	0	<10	0	ug/l	0	21.1	0.0%
BH41A	PRO	30/11/2011	2011	25	25	34	34	ug/l	-9	21.1	-42.6%
BH41A	PRO	16/12/2011	2011	<10	0	13	13	ug/l	-13	21.1	-61.5%
BH41A	PRO	26/01/2012	2012	45	45	10	10	ug/l	35	21.1	165.7%
BH41A	PRO	28/02/2012	2012	33	33	31	31	ug/l	2	21.1	9.5%
BH41A	PRO	29/03/2012	2012	10	10	10	10	ug/l	0	21.1	0.0%
BH41A	PRO	25/04/2012	2012	10	10	10	10	ug/l	0	21.1	0.0%
BH41A	PRO	22/05/2012	2012	10	10	10	10	ug/l	0	21.1	0.0%
BH41A	PRO	27/06/2012	2012	16	16	10	10	ug/l	6	21.1	28.4%
BH41A	PRO	23/07/2012	2012	<10	0	<10	0	ug/l	0	21.1	0.0%
BH41A	PRO	20/08/2012	2012	15	15	<10	0	ug/l	15	21.1	71.0%
BH41A	PRO	20/08/2012	2012	15	15	<10	0	ug/l	15	21.1	71.0%
BH41A	PRO	18/09/2012	2012	18	18	<10	0	ug/l	18	21.1	85.2%
BH41A	PRO	23/10/2012	2012	<10	0	<10	0	ug/l	0	21.1	0.0%
BH41A	PRO	22/11/2012	2012	<10	0	<10	0	ug/l	0	21.1	0.0%
BH41A	PRO	03/12/2012	2012	<10	0	<10	0	ug/l	0	21.1	0.0%
BH41A	PRO	16/01/2013	2013	17	17	<10	0	ug/l	17	21.1	80.5%
BH41a	PRO	19/02/2013	2013	<10	0	<10	0	ug/l	0	21.1	0.0%
BH41A	PRO	19/02/2013	2013	17	17	14	14	ug/l	3	21.1	14.2%

Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference	Mean Purged	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH41A	DRO	16/12/2009	2009	24000	24000	160000	160000	ug/l	-136000	2416.0	-5629.0%
BH41A	DRO	28/01/2010	2010	540	540	220	220	ug/l	320	2416.0	13.2%
BH41A	DRO	25/02/2010	2010	480	480	220	220	ug/l	260	2416.0	10.8%
BH41A	DRO	31/03/2010	2010	240	240	120	120	ug/l	120	2416.0	5.0%
BH41A	DRO	04/05/2010	2010	1100	1100	270	270	ug/l	830	2416.0	34.4%
BH41A	DRO	27/05/2010	2010	2400	2400	1100	1100	ug/l	1300	2416.0	53.8%
BH41A	DRO	30/06/2010	2010	130	130	<100	0	ug/l	130	2416.0	5.4%
BH41A	DRO	29/07/2010	2010	<100	0	<100	0	ug/l	0	2416.0	0.0%
BH41A	DRO	31/08/2010	2010	<100	0	<100	0	ug/l	0	2416.0	0.0%
BH41A	DRO	28/09/2010	2010	290	290	390	390	ug/l	-100	2416.0	-4.1%
BH41A	DRO	28/10/2010	2010	300	300	130	130	ug/l	170	2416.0	7.0%
BH41A	DRO	30/11/2010	2010	<100	0	<100	0	ug/l	0	2416.0	0.0%
BH41A	DRO	16/12/2010	2010	140	140	<100	0	ug/l	140	2416.0	5.8%
BH41A	DRO	27/01/2011	2011	<100	0	<100	0	ug/l	0	2416.0	0.0%
BH41A	DRO	24/02/2011	2011	337	337	273	273	ug/l	64	2416.0	2.6%
BH41A	DRO	29/03/2011	2011	221	221	213	213	ug/l	8	2416.0	0.3%
BH41A	DRO	19/04/2011	2011	<10	0	<10	0	ug/l	0	2416.0	0.0%
BH41A	DRO	26/05/2011	2011	25.6	25.6	<10	0	ug/l	25.6	2416.0	1.1%
BH41A	DRO	10/06/2011	2011	106	106	42.8	42.8	ug/l	63.2	2416.0	2.6%
BH41A	DRO	28/07/2011	2011	6220	6220	3350	3350	ug/l	2870	2416.0	118.8%
BH41A	DRO	31/08/2011	2011	13400	13400	70.7	70.7	ug/l	13329.3	2416.0	551.7%
BH41A	DRO	30/09/2011	2011	9690	9690	3620	3620	ug/l	6070	2416.0	251.2%
BH41A	DRO	13/10/2011	2011	123	123	74.6	74.6	ug/l	48.4	2416.0	2.0%
BH41A	DRO	30/11/2011	2011	3100	3100	882	882	ug/l	2218	2416.0	91.8%
BH41A	DRO	16/12/2011	2011	3240	3240	3080	3080	ug/l	160	2416.0	6.6%
BH41A	DRO	26/01/2012	2012	3180	3180	619	619	ug/l	2561	2416.0	106.0%
BH41A	DRO	28/02/2012	2012	581	581	586	586	ug/l	-5	2416.0	-0.2%
BH41A	DRO	29/03/2012	2012	1650	1650	240	240	ug/l	1410	2416.0	58.4%
BH41A	DRO	25/04/2012	2012	5930	5930	2970	2970	ug/l	2960	2416.0	122.5%
BH41A	DRO	22/05/2012	2012	3610	3610	111	111	ug/l	3499	2416.0	144.8%
BH41A	DRO	27/06/2012	2012	2100	2100	196	196	ug/l	1904	2416.0	78.8%
BH41A	DRO	23/07/2012	2012	2190	2190	82.5	82.5	ug/l	2107.5	2416.0	87.2%
BH41A	DRO	20/08/2012	2012	1480	1480	112	112	ug/l	1368	2416.0	56.6%
BH41A	DRO	20/08/2012	2012	1480	1480	112	112	ug/l	1368	2416.0	56.6%
BH41A	DRO	18/09/2012	2012	1780	1780	54.4	54.4	ug/l	1725.6	2416.0	71.4%
BH41A	DRO	23/10/2012	2012	790	790	1250	1250	ug/l	-460	2416.0	-19.0%
BH41A	DRO	22/11/2012	2012	1060	1060	409	409	ug/l	651	2416.0	26.9%
BH41A	DRO	03/12/2012	2012	1960	1960	424	424	ug/l	1536	2416.0	63.6%
BH41A	DRO	16/01/2013	2013	1680	1680	1270	1270	ug/l	410	2416.0	17.0%
BH41a	DRO	19/02/2013	2013	2640	2640	464	464	ug/l	2176	2416.0	90.1%
BH41A	DRO	05/03/2013	2013	864	864	610	610	ug/l	254	2416.0	10.5%

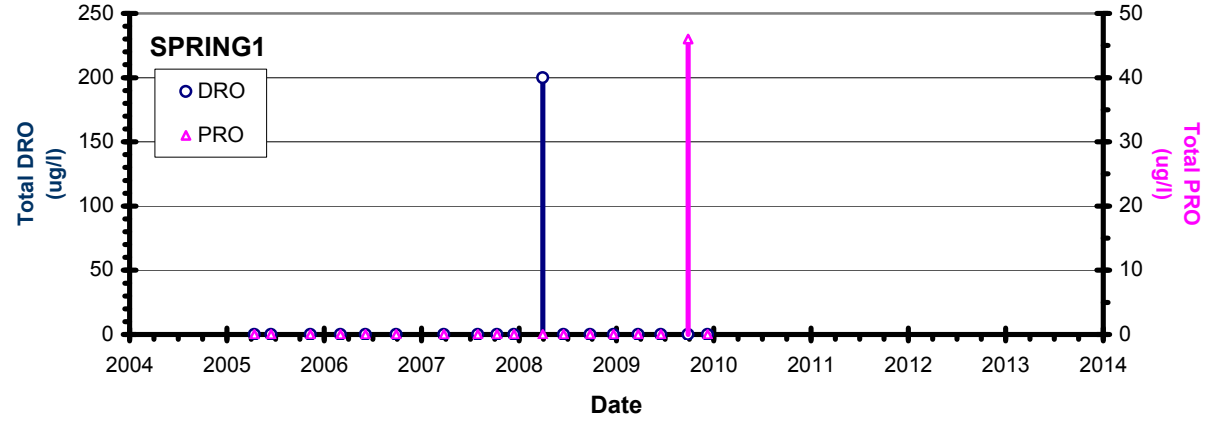
Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference (Dif)	Mean Purged Conc. (MPC)	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH34B	PRO	16/12/2009	2009	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	28/01/2010	2010	1800	1800	<30	0	ug/l	1800	50.5	3561.6%
BH34B	PRO	25/02/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	30/03/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	04/05/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	26/05/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	30/06/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	28/07/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	25/08/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	28/09/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	27/10/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	29/11/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	14/12/2010	2010	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	27/01/2011	2011	<30	0	<30	0	ug/l	0	50.5	0.0%
BH34B	PRO	23/02/2011	2011	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	16/03/2011	2011	<10	0	1960	1960	ug/l	-1960	50.5	-3878.2%
BH34B	PRO	19/04/2011	2011	<50	0	<50	0	ug/l	0	50.5	0.0%
BH34B	PRO	26/05/2011	2011	17	17	<10	0	ug/l	17	50.5	33.6%
BH34B	PRO	09/06/2011	2011	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	27/07/2011	2011	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	30/08/2011	2011	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	27/09/2011	2011	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	12/10/2011	2011	17	17	20	20	ug/l	-3	50.5	-5.9%
BH34B	PRO	29/11/2011	2011	27	27	21	21	ug/l	6	50.5	11.9%
BH34B	PRO	15/12/2011	2011	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	25/01/2012	2012	25	25	27	27	ug/l	-2	50.5	-4.0%
BH34B	PRO	27/02/2012	2012	27	27	28	28	ug/l	-1	50.5	-2.0%
BH34B	PRO	25/04/2012	2012	15	15	20	20	ug/l	-5	50.5	-9.9%
BH34B	PRO	21/05/2012	2012	10	10	10	10	ug/l	0	50.5	0.0%
BH34B	PRO	27/06/2012	2012	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	23/07/2012	2012	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	20/08/2012	2012	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	20/08/2012	2012	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	18/09/2012	2012	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	22/11/2012	2012	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	03/12/2012	2012	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	16/01/2013	2013	18	18	24	24	ug/l	-6	50.5	-11.9%
BH34b	PRO	19/02/2013	2013	<10	0	<10	0	ug/l	0	50.5	0.0%
BH34B	PRO	05/03/2013	2013	15	15	14	14	ug/l	1	50.5	2.0%

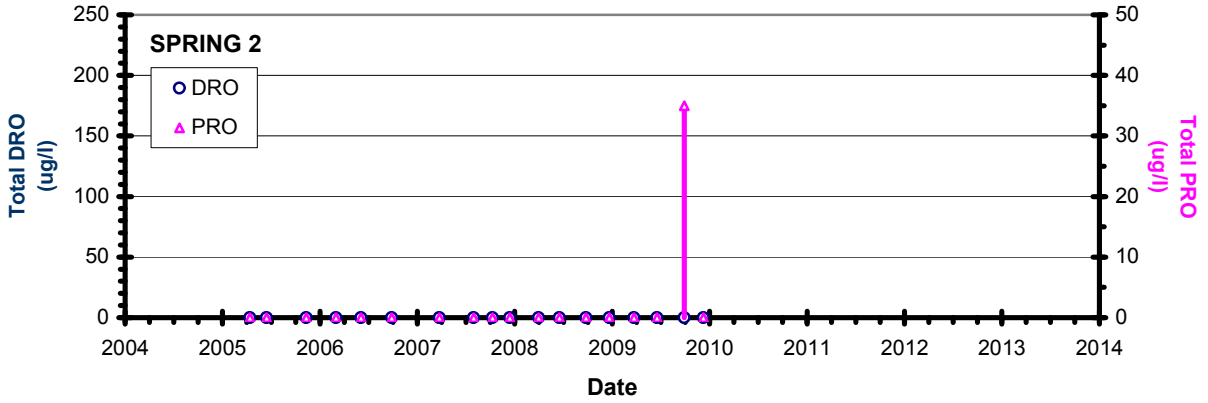
Borehole ID	Hydrocarbon Group	Date	Year	Purged		Pre-Purge (NP)		Units	Conc. Difference	Mean Purged	Dif as % MPC
				Conc.	LOD = 0	Value	LOD = 0				
BH34B	DRO	16/12/2009	2009	150	150	<100	0	ug/l	150	319.8	46.9%
BH34B	DRO	28/01/2010	2010	530	530	100	100	ug/l	430	319.8	134.4%
BH34B	DRO	25/02/2010	2010	280	280	180	180	ug/l	100	319.8	31.3%
BH34B	DRO	30/03/2010	2010	<100	0	120	120	ug/l	-120	319.8	-37.5%
BH34B	DRO	04/05/2010	2010	270	270	330	330	ug/l	-60	319.8	-18.8%
BH34B	DRO	26/05/2010	2010	340	340	400	400	ug/l	-60	319.8	-18.8%
BH34B	DRO	30/06/2010	2010	360	360	360	360	ug/l	0	319.8	0.0%
BH34B	DRO	28/07/2010	2010	100	100	200	200	ug/l	-100	319.8	-31.3%
BH34B	DRO	25/08/2010	2010	<100	0	5800	5800	ug/l	-5800	319.8	-1813.4%
BH34B	DRO	28/09/2010	2010	840	840	370	370	ug/l	470	319.8	146.9%
BH34B	DRO	27/10/2010	2010	100	100	<100	0	ug/l	100	319.8	31.3%
BH34B	DRO	29/11/2010	2010	310	310	<100	0	ug/l	310	319.8	96.9%
BH34B	DRO	14/12/2010	2010	140	140	220	220	ug/l	-80	319.8	-25.0%
BH34B	DRO	27/01/2011	2011	<100	0	<100	0	ug/l	0	319.8	0.0%
BH34B	DRO	23/02/2011	2011	55.8	55.8	52.6	52.6	ug/l	3.2	319.8	1.0%
BH34B	DRO	16/03/2011	2011	342	342	251	251	ug/l	91	319.8	28.5%
BH34B	DRO	19/04/2011	2011	246	246	221	221	ug/l	25	319.8	7.8%
BH34B	DRO	26/05/2011	2011	1290	1290	379	379	ug/l	911	319.8	284.8%
BH34B	DRO	09/06/2011	2011	2050	2050	312	312	ug/l	1738	319.8	543.4%
BH34B	DRO	27/07/2011	2011	1160	1160	149	149	ug/l	1011	319.8	316.1%
BH34B	DRO	30/08/2011	2011	76.4	76.4	185	185	ug/l	-108.6	319.8	-34.0%
BH34B	DRO	27/09/2011	2011	238	238	251	251	ug/l	-13	319.8	-4.1%
BH34B	DRO	12/10/2011	2011	265	265	168	168	ug/l	97	319.8	30.3%
BH34B	DRO	29/11/2011	2011	409	409	98.8	98.8	ug/l	310.2	319.8	97.0%
BH34B	DRO	15/12/2011	2011	94.2	94.2	81.7	81.7	ug/l	12.5	319.8	3.9%
BH34B	DRO	25/01/2012	2012	131	131	134	134	ug/l	-3	319.8	-0.9%
BH34B	DRO	27/02/2012	2012	179	179	152	152	ug/l	27	319.8	8.4%
BH34B	DRO	25/04/2012	2012	507	507	617	617	ug/l	-110	319.8	-34.4%
BH34B	DRO	21/05/2012	2012	120	120	241	241	ug/l	-121	319.8	-37.8%
BH34B	DRO	27/06/2012	2012	109	109	130	130	ug/l	-21	319.8	-6.6%
BH34B	DRO	23/07/2012	2012	287	287	226	226	ug/l	61	319.8	19.1%
BH34B	DRO	20/08/2012	2012	78.2	78.2	105	105	ug/l	-26.8	319.8	-8.4%
BH34B	DRO	20/08/2012	2012	78.2	78.2	105	105	ug/l	-26.8	319.8	-8.4%
BH34B	DRO	18/09/2012	2012	439	439	268	268	ug/l	171	319.8	53.5%
BH34B	DRO	22/11/2012	2012	52.8	52.8	60.8	60.8	ug/l	-8	319.8	-2.5%
BH34B	DRO	03/12/2012	2012	92.1	92.1	71.9	71.9	ug/l	20.2	319.8	6.3%
BH34B	DRO	16/01/2013	2013	330	330	385	385	ug/l	-55	319.8	-17.2%
BH34b	DRO	19/02/2013	2013	124	124	111	111	ug/l	13	319.8	4.1%
BH34B	DRO	05/03/2013	2013	300	300	397	397	ug/l	-97	319.8	-30.3%

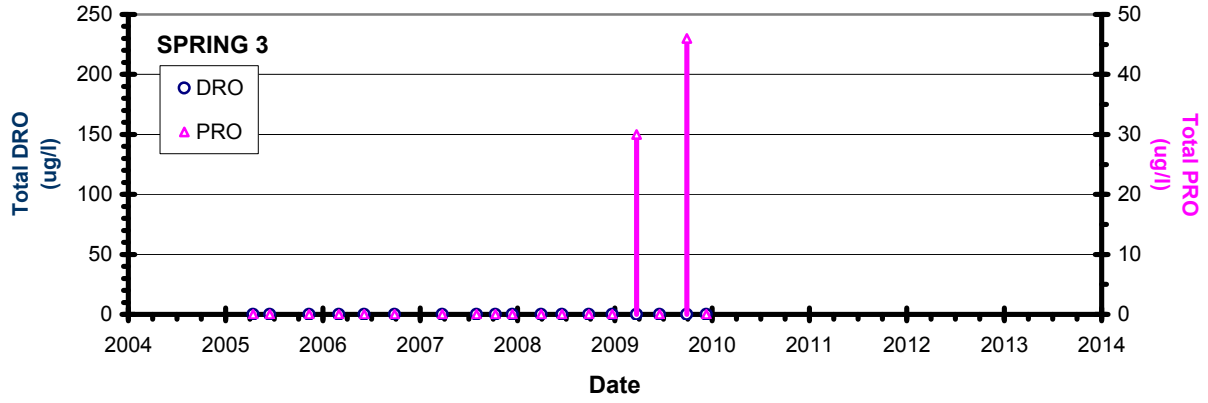
Appendix 10

Time Series Charts ï Springs

CHART 1.1 Spring Montoring Locations







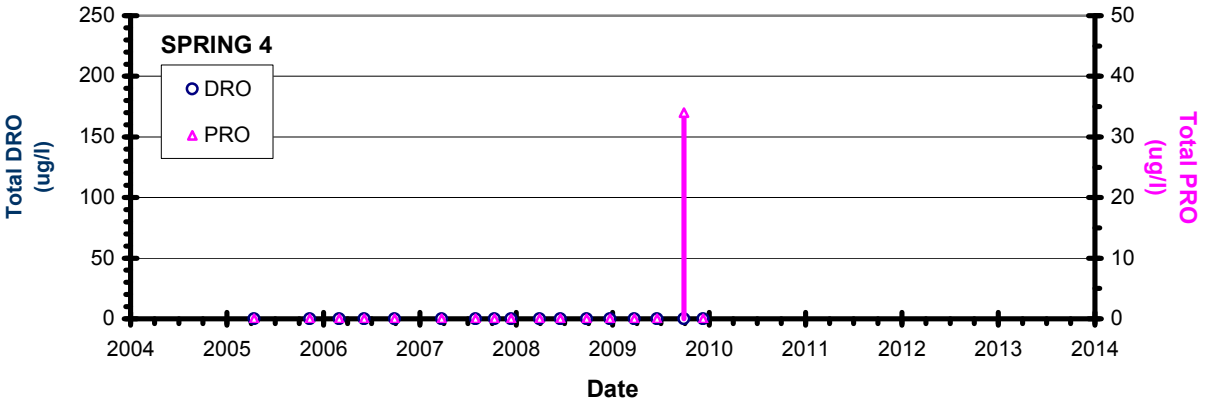
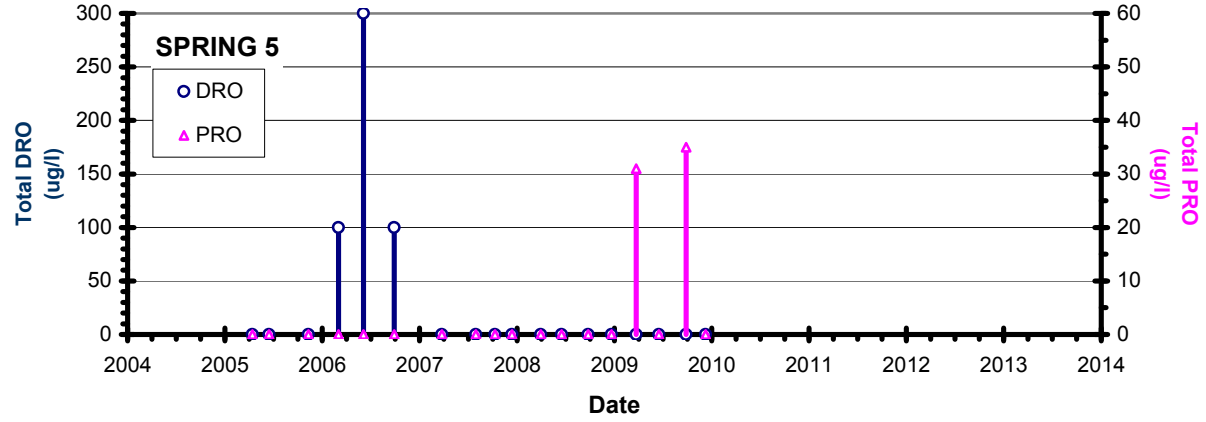
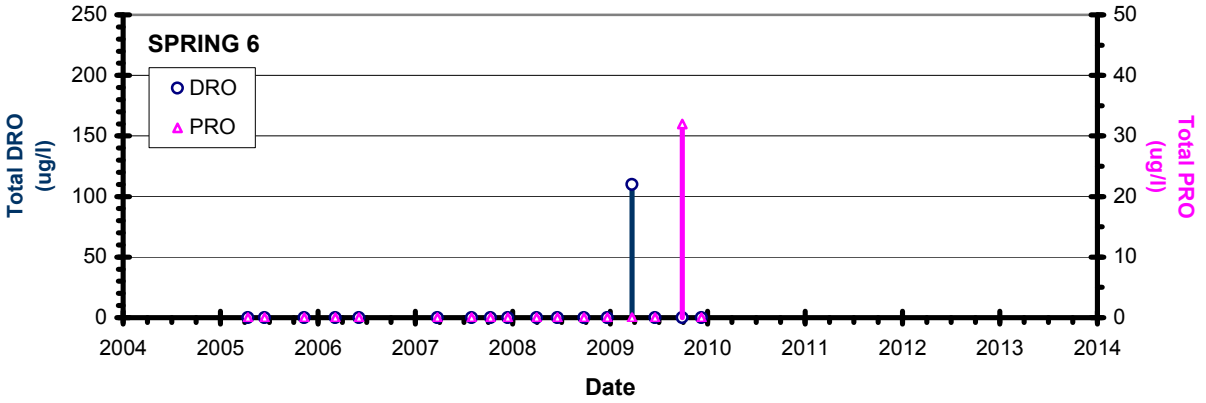
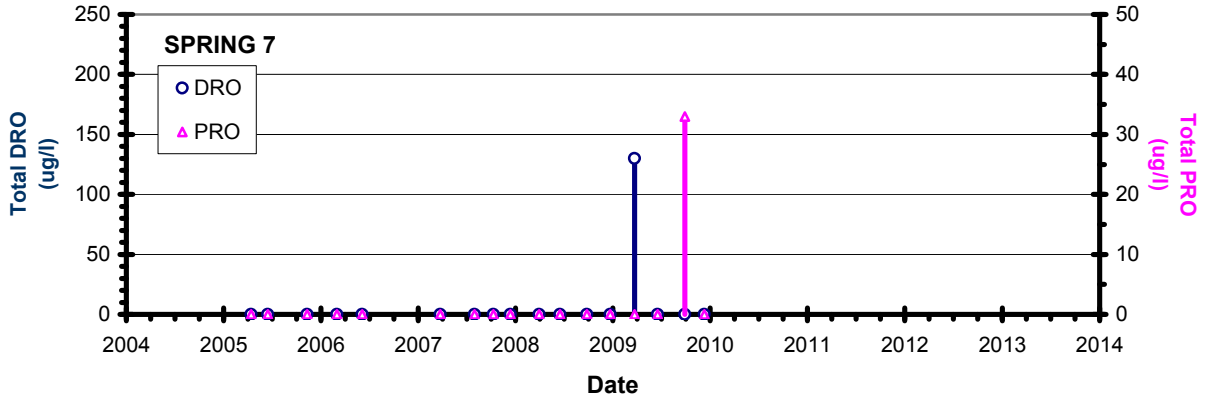


CHART 1.2 Spring Montoring Locations







Appendix 11

Laboratory Certificates for Spring Analyses (April 2012)

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

WSP Remediation
Fairway House
Paramount Business Park
St Mellons
Cardiff
South Glamorgan
CF3 0LW

Attention: Steve Gronow

CERTIFICATE OF ANALYSIS

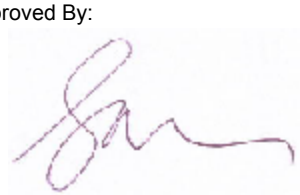
Date:	18 April 2012
Customer:	H_WSP_CDF
Sample Delivery Group (SDG):	120404-31
Your Reference:	02826-003
Location:	South Hook LNG
Report No:	178115

We received 7 samples on Wednesday April 04, 2012 and 7 of these samples were scheduled for analysis which was completed on Wednesday April 18, 2012. 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.

Approved By:



Sonia McWhan

Operations Manager

Alcontrol Laboratories is a trading division of ALcontrol UK Limited
Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No.

CERTIFICATE OF ANALYSIS

SDG:	120404-31	**Location:**	South Hook LNG	**Order Number:**	20672/2826-006/OR
Job:	H_WSP_CDF-6	**Customer:**	WSP Remediation	**Report Number:**	178115
Client Reference:	02826-003	**Attention:**	Steve Gronow	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
5408790	SPRING 1			02/04/2012
5408793	SPRING 2			02/04/2012
5408794	SPRING 3			02/04/2012
5408795	SPRING 4			02/04/2012
5408796	SPRING 5			02/04/2012
5408797	SPRING 6			02/04/2012
5408798	SPRING 7			02/04/2012

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

CERTIFICATE OF ANALYSIS

SDG:	120404-31	**Location:**	South Hook LNG	**Order Number:**	20672/2826-006/OR
Job:	H_WSP_CDF-6	**Customer:**	WSP Remediation	**Report Number:**	178115
Client Reference:	02826-003	**Attention:**	Steve Gronow	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			5408790	SPRING 1			0.5l glass bottle (AL
			5408793	SPRING 2			Vial (ALE297)
			5408794	SPRING 3			0.5l glass bottle (AL
			5408795	SPRING 4			Vial (ALE297)
			5408796	SPRING 5			0.5l glass bottle (AL
			5408797	SPRING 6			500ml Plastic (ALE2
			5408798	SPRING 7			Vial (ALE297)
							0.5l glass bottle (AL
							Vial (ALE297)
							0.5l glass bottle (AL
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 1					X
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 7	X	X	X	X	X
							X
							X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 7		X	X	X	X
							X
							X
							X

CERTIFICATE OF ANALYSIS

SDG:	120404-31	**Location:**	South Hook LNG	**Order Number:**	20672/2826-006/OR
Job:	H_WSP_CDF-6	**Customer:**	WSP Remediation	**Report Number:**	178115
Client Reference:	02826-003	**Attention:**	Steve Gronow	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	SPRING 1	SPRING 2	SPRING 3	SPRING 4	SPRING 5	SPRING 6
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	02/04/2012	02/04/2012	02/04/2012	02/04/2012	02/04/2012	02/04/2012
			Sample Time	.	.	.	.	.	.
			Date Received	04/04/2012	04/04/2012	04/04/2012	04/04/2012	04/04/2012	04/04/2012
			SDG Ref	120404-31	120404-31	120404-31	120404-31	120404-31	120404-31
			Lab Sample No.(s)	5408790	5408793	5408794	5408795	5408796	5408797
			AGS Reference						
Copper (diss.filt)	<0.85 µg/l	TM152						<0.85 #	
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		<46 #	<46 #	<46 #	<46 #	<46 #	<46 #

CERTIFICATE OF ANALYSIS

SDG:	120404-31	**Location:**	South Hook LNG	**Order Number:**	20672/2826-006/OR
Job:	H_WSP_CDF-6	**Customer:**	WSP Remediation	**Report Number:**	178115
Client Reference:	02826-003	**Attention:**	Steve Gronow	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	
			Depth (m)	.
			Sample Type	Water(GW/SW)
			Date Sampled	02/04/2012
			Sample Time	.
			Date Received	04/04/2012
			SDG Ref	120404-31
			Lab Sample No.(s)	5408798
			AGS Reference	
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172	<46 #	

CERTIFICATE OF ANALYSIS

SDG:	120404-31	**Location:**	South Hook LNG	**Order Number:**	20672/2826-006/OR
Job:	H_WSP_CDF-6	**Customer:**	WSP Remediation	**Report Number:**	178115
Client Reference:	02826-003	**Attention:**	Steve Gronow	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	SPRING 1	SPRING 2	SPRING 3	SPRING 4	SPRING 5	SPRING 6
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	02/04/2012	02/04/2012	02/04/2012	02/04/2012	02/04/2012	02/04/2012
			Sample Time	.	.	.	.	.	.
			Date Received	04/04/2012	04/04/2012	04/04/2012	04/04/2012	04/04/2012	04/04/2012
			SDG Ref	120404-31	120404-31	120404-31	120404-31	120404-31	120404-31
			Lab Sample No.(s)	5408790	5408793	5408794	5408795	5408796	5408797
			AGS Reference						
GRO >C5-C12	<50 µg/l	TM245		<50 #	<50 #	<50 #	<50 #	<50 #	<50 #
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245		<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Benzene	<7 µg/l	TM245		<7 #	<7 #	<7 #	<7 #	<7 #	<7 #
Toluene	<4 µg/l	TM245		<4 #	<4 #	<4 #	<4 #	<4 #	<4 #
Ethylbenzene	<5 µg/l	TM245		<5 #	<5 #	<5 #	<5 #	<5 #	<5 #
m,p-Xylene	<8 µg/l	TM245		<8 #	<8 #	<8 #	<8 #	<8 #	<8 #
o-Xylene	<3 µg/l	TM245		<3 #	<3 #	<3 #	<3 #	<3 #	<3 #
Sum of detected Xylenes	<11 µg/l	TM245		<11	<11	<11	<11	<11	<11
Sum of detected BTEX	<28 µg/l	TM245		<28	<28	<28	<28	<28	<28

CERTIFICATE OF ANALYSIS

SDG:	120404-31	**Location:**	South Hook LNG	**Order Number:**	20672/2826-006/OR
Job:	H_WSP_CDF-6	**Customer:**	WSP Remediation	**Report Number:**	178115
Client Reference:	02826-003	**Attention:**	Steve Gronow	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	
			Depth (m)	.
			Sample Type	Water(GW/SW)
			Date Sampled	02/04/2012
			Sample Time	.
			Date Received	04/04/2012
			SDG Ref	120404-31
			Lab Sample No.(s)	5408798
			AGS Reference	SPRING 7
GRO >C5-C12	<50 µg/l	TM245	<50 #	
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245	<3 #	
Benzene	<7 µg/l	TM245	<7 #	
Toluene	<4 µg/l	TM245	<4 #	
Ethylbenzene	<5 µg/l	TM245	<5 #	
m,p-Xylene	<8 µg/l	TM245	<8 #	
o-Xylene	<3 µg/l	TM245	<3 #	
Sum of detected Xylenes	<11 µg/l	TM245	<11	
Sum of detected BTEX	<28 µg/l	TM245	<28	

CERTIFICATE OF ANALYSIS

SDG:	120404-31	**Location:**	South Hook LNG	**Order Number:**	20672/2826-006/OR
Job:	H_WSP_CDF-6	**Customer:**	WSP Remediation	**Report Number:**	178115
Client Reference:	02826-003	**Attention:**	Steve Gronow	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	120404-31	**Location:**	South Hook LNG	**Order Number:**	20672/2826-006/OR
Job:	H_WSP_CDF-6	**Customer:**	WSP Remediation	**Report Number:**	178115
Client Reference:	02826-003	**Attention:**	Steve Gronow	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	5408790	5408793	5408794	5408795	5408796	5408797	5408798
Customer Sample Ref.	SPRING 1	SPRING 2	SPRING 3	SPRING 4	SPRING 5	SPRING 6	SPRING 7
AGS Ref.							
Depth							
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Dissolved Metals by ICP-MS					11-Apr-2012		
EPH (DRO) (C10-C40) Aqueous (W)	18-Apr-2012	18-Apr-2012	18-Apr-2012	18-Apr-2012	18-Apr-2012	18-Apr-2012	18-Apr-2012
GRO by GC-FID (W)	15-Apr-2012	15-Apr-2012	15-Apr-2012	15-Apr-2012	15-Apr-2012	15-Apr-2012	15-Apr-2012

SDG:	120404-31	**Location:**	South Hook LNG	**Order Number:**	20672/2826-006/OR
Job:	H_WSP_CDF-6	**Customer:**	WSP Remediation	**Report Number:**	178115
Client Reference:	02826-003	**Attention:**	Steve Gronow	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5 -C12 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.

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
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 AROCLOR 1254 / PCB CON	D&C	HEXANE:ACETONE	END OVER END	GC-MS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE:ACETONE	MICROWAVE TM218.	GC-MS
>C6-C40	WET	HEXANE:ACETONE	SHAKER	GC-FID
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE:ACETONE	SHAKER	GC-FID
SEMI VOLATILE ORGANIC COMPOUNDS	WET	DCM:ACETONE	SONICATE	GC-MS

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 AROCLOR 1254	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PESTOC POPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	ACETONE	SOLID PHASE EXTRACTION	GC MS
TPH by INFRARED (IR)	TCE	STIRRED EXTRACTION (STIR-BAR)	IR
MINERAL OIL by IR	TCE	STIRRED EXTRACTION (STIR-BAR)	IR
GLYCOLS	NONE	DIRECT INJECTION	GC FID

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

Appendix 12

Laboratory Certificates for Groundwater Analyses
(RPS monitoring since October 2012)

ALcontrol Laboratories

Unit 7-8 Hawarden Business Park
Manor Road (off Manor Lane)
Hawarden
Deeside
CH5 3US
Tel: (01244) 528700
Fax: (01244) 528701
email: mkt@alcontrol.com
Website: www.alcontrol.com

RPS Consultants Ltd
Conrad House
Beaufort Square
Chepstow
Gwent
NP16 5EP

Attention: Helen McIntosh

CERTIFICATE OF ANALYSIS

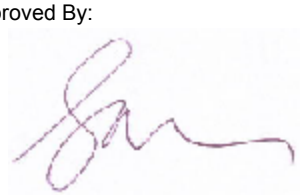
Date:	07 November 2012
Customer:	H_RPS_CHP
Sample Delivery Group (SDG):	121027-11
Your Reference:	JER5575U
Location:	SHLNG
Report No:	200778

We received 21 samples on Thursday October 25, 2012 and 9 of these samples were scheduled for analysis which was completed on Wednesday November 07, 2012. 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.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6411998	BH14			24/10/2012
6411987	BH34			24/10/2012
6411990	BH43			24/10/2012
6411996	BH99			24/10/2012
6411992	BH41A			24/10/2012
6411994	BH42A			24/10/2012
6411993	BH41A DUPLICATE			24/10/2012
6411995	BH42A DUPLICATE			24/10/2012
6411981	BH41A NP			24/10/2012
6411984	BH42A NP			24/10/2012
6411982	BH41A NP DUPLICATE			24/10/2012
6411986	BH42A NP DUPLICATE			24/10/2012
6411999	BH14 DUPLICATE			24/10/2012
6411989	BH34 DUPLICATE			24/10/2012
6411991	BH43 DUPLICATE			24/10/2012
6411997	BH99 DUPLICATE			24/10/2012
6411974	BH34NP			24/10/2012
6411978	BH43NP			24/10/2012
6411976	BH34NP DUPLICATE			24/10/2012
6411980	BH43NP DUPLICATE			24/10/2012
6412000	TRIP BLANK			24/10/2012

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

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			6411987	BH34			1l green glass bottle
			6411974	BH34NP			1l green glass bottle
			6411992	BH41A			1l green glass bottle
			6411981	BH41A NP			1l green glass bottle
			6411994	BH42A			1l green glass bottle
			6411984	BH42A NP			1l green glass bottle
			6411990	BH43			1l green glass bottle
			6411978	BH43NP			1l green glass bottle
			6411997	BH99 DUPLICATE			1l green glass bottle
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 9	X		X		X		X		X		X		X		X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 9		X		X		X		X		X		X		X	X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8	X		X		X		X		X		X		X		

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH34	BH43	BH41A	BH42A	BH41A NP	BH42A NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	24/10/2012	24/10/2012	24/10/2012	24/10/2012	24/10/2012	24/10/2012
			Sample Time	.	.	.	.	.	.
			Date Received	25/10/2012	25/10/2012	25/10/2012	25/10/2012	25/10/2012	25/10/2012
			SDG Ref	121027-11	121027-11	121027-11	121027-11	121027-11	121027-11
			Lab Sample No.(s)	6411987	6411990	6411992	6411994	6411981	6411984
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		70.1 #	185 #	790 #	50400 #	1250 #	21800 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		46.6	32.3	307	11700	459	5370
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		23.6	153	484	38700	791	16400

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH99 DUPLICATE	BH34NP	BH43NP			
			Depth (m)	.	.	.			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	24/10/2012	24/10/2012	24/10/2012			
			Sample Time	.	.	.			
			Date Received	25/10/2012	25/10/2012	25/10/2012			
			SDG Ref	121027-11	121027-11	121027-11			
			Lab Sample No.(s)	6411997	6411974	6411978			
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		439 #	64.2 #	172 #			
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		43.8	40.3	<10			
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		395	24	172			

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH34	BH43	BH41A	BH42A	BH41A NP	BH42A NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	24/10/2012	24/10/2012	24/10/2012	24/10/2012	24/10/2012	24/10/2012
			Sample Time	.	.	.	.	.	.
			Date Received	25/10/2012	25/10/2012	25/10/2012	25/10/2012	25/10/2012	25/10/2012
			SDG Ref	121027-11	121027-11	121027-11	121027-11	121027-11	121027-11
			Lab Sample No.(s)	6411987	6411990	6411992	6411994	6411981	6411984
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	11	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	70	<10	78
GRO >C8-C10	<10 µg/l	TM245		<10	29	<10	274	<10	586
GRO >C5-C10	<10 µg/l	TM245		<10	32	<10	355	<10	672

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH99 DUPLICATE	BH34NP	BH43NP			
			Depth (m)	.	.	.			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	24/10/2012	24/10/2012	24/10/2012			
			Sample Time	.	.	.			
			Date Received	25/10/2012	25/10/2012	25/10/2012			
			SDG Ref	121027-11	121027-11	121027-11			
			Lab Sample No.(s)	6411997	6411974	6411978			
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10 §	<10	<10			
GRO >C6-C8	<10 µg/l	TM245		<10 §	<10	<10			
GRO >C8-C10	<10 µg/l	TM245		30 §	<10	26			
GRO >C5-C10	<10 µg/l	TM245		31 §	<10	29			

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH34	BH43	BH41A	BH42A	BH41A NP	BH42A NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	24/10/2012	24/10/2012	24/10/2012	24/10/2012	24/10/2012	24/10/2012
			Sample Time	.	.	.	.	.	.
			Date Received	25/10/2012	25/10/2012	25/10/2012	25/10/2012	25/10/2012	25/10/2012
			SDG Ref	121027-11	121027-11	121027-11	121027-11	121027-11	121027-11
			Lab Sample No.(s)	6411987	6411990	6411992	6411994	6411981	6411984
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	57.9	<1	17.3
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1	<1	3.29	<1	1.87
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		3.66	<2	<2	<4	<2	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend		Customer Sample R	BH34	BH43	BH41A	BH42A	BH41A NP	BH42A NP
#	ISO17025 accredited.							
M	*m*CERTS accredited.							
§	Deviating sample.							
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 individual compounds within samples aren't corrected for the recovery	Depth (m)	.	.	.	.	.	.
		Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
		Date Sampled	24/10/2012	24/10/2012	24/10/2012	24/10/2012	24/10/2012	24/10/2012
		Sample Time	.	.	.	.	.	.
		Date Received	25/10/2012	25/10/2012	25/10/2012	25/10/2012	25/10/2012	25/10/2012
		SDG Ref	121027-11	121027-11	121027-11	121027-11	121027-11	121027-11
		Lab Sample No.(s)	6411987	6411990	6411992	6411994	6411981	6411984
(F)	Trigger breach confirmed	AGS Reference						

Component	LOD/Units	Method						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Carbazole (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Chrysene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<5	<5	<10	<5	<5
Fluoranthene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Fluorene (aq)	<1 µg/l	TM176	<1	<1	<1	6.4	<1	3.13
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Pentachlorophenol (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Phenol (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Hexachloroethane (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Nitrobenzene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Naphthalene (aq)	<1 µg/l	TM176	<1	<1	<1	23.4	<1	9.46
Isophorone (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176	<1	<1	<1	12.4	<1	4.37
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	<2	<1	<1
Pyrene (aq)	<1 µg/l	TM176	<1	<1	<1	2.24	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH34NP	BH43NP				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	24/10/2012	24/10/2012				
			Sample Time	.	.				
			Date Received	25/10/2012	25/10/2012				
			SDG Ref	121027-11	121027-11				
			Lab Sample No.(s)	6411974	6411978				
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1				
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1				
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1				
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1				
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1				
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1				
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1				
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1				
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1				
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
Azobenzene (aq)	<1 µg/l	TM176		<1	<1				
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1				
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1				
Anthracene (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2				
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1				

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH34NP	BH43NP				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	24/10/2012	24/10/2012				
			Sample Time	.	.				
			Date Received	25/10/2012	25/10/2012				
			SDG Ref	121027-11	121027-11				
			Lab Sample No.(s)	6411974	6411978				
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1				
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1				
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1				
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1				
Carbazole (aq)	<1 µg/l	TM176		<1	<1				
Chrysene (aq)	<1 µg/l	TM176		<1	<1				
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1				
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	1.05				
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1				
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5				
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1				
Fluorene (aq)	<1 µg/l	TM176		<1	<1				
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1				
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1				
Phenol (aq)	<1 µg/l	TM176		<1	<1				
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1				
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1				
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1				
Naphthalene (aq)	<1 µg/l	TM176		<1	<1				
Isophorone (aq)	<1 µg/l	TM176		<1	<1				
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1				
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1				
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1				
Pyrene (aq)	<1 µg/l	TM176		<1	<1				

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Notification of Deviating Samples

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
6441054	BH99 DUPLICATE		LIQUID	GRO by GC-FID (W)	GRO >C5-C10	Container with Headspace provided for volatiles analysis
6441054	BH99 DUPLICATE		LIQUID	GRO by GC-FID (W)	GRO >C5-C6	Container with Headspace provided for volatiles analysis
6441054	BH99 DUPLICATE		LIQUID	GRO by GC-FID (W)	GRO >C6-C8	Container with Headspace provided for volatiles analysis
6441054	BH99 DUPLICATE		LIQUID	GRO by GC-FID (W)	GRO >C8-C10	Container with Headspace provided for volatiles analysis

Note : Test results may be compromised

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6411987	6411990	6411997	6411992	6411994	6411981	6411984	6411974	6411978
Customer Sample Ref.	BH34	BH43	BH99 DUPLICATE	BH41A	BH42A	BH41A NP	BH42A NP	BH34NP	BH43NP
AGS Ref.									
Depth									
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	02-Nov-2012	02-Nov-2012	07-Nov-2012	02-Nov-2012	02-Nov-2012	02-Nov-2012	02-Nov-2012	02-Nov-2012	02-Nov-2012
GRO by GC-FID (W)	01-Nov-2012	01-Nov-2012	01-Nov-2012	01-Nov-2012	01-Nov-2012	01-Nov-2012	01-Nov-2012	01-Nov-2012	01-Nov-2012
SVOC MS (W) - Aqueous	02-Nov-2012	02-Nov-2012		01-Nov-2012	02-Nov-2012	02-Nov-2012	02-Nov-2012	02-Nov-2012	02-Nov-2012

CERTIFICATE OF ANALYSIS

SDG:	121027-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	200778
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5 -C12 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.

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
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 AROCLOR 1254 / PCB CON	D&C	HEXANE:ACETONE	END OVER END	GC-MS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE:ACETONE	MICROWAVE TM218.	GC-MS
>C6-C40	WET	HEXANE:ACETONE	SHAKER	GC-FID
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE:ACETONE	SHAKER	GC-FID
SEMI VOLATILE ORGANIC COMPOUNDS	WET	DCM:ACETONE	SONICATE	GC-MS

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 AROCLOR 1254	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PESTOCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	ACETONE	SOLID PHASE EXTRACTION	GC MS
TPH by INFRARED (IR)	TCE	STIRRED EXTRACTION (STIR-BAR)	IR
MINERAL OIL by IR	TCE	STIRRED EXTRACTION (STIR-BAR)	IR
GLYCOLS	NONE	DIRECT INJECTION	GC FID

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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RPS Consultants Ltd
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Aztec West
Almondsbury
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BS32 4AQ

Attention: Adrian Green

CERTIFICATE OF ANALYSIS

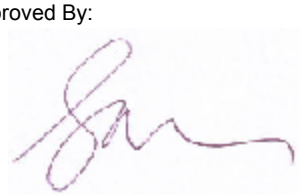
Date:	06 December 2012
Customer:	H_RPS_ADB
Sample Delivery Group (SDG):	121128-12
Your Reference:	JER5575U
Location:	SHLNG
Report No:	204663

We received 19 samples on Tuesday November 27, 2012 and 10 of these samples were scheduled for analysis which was completed on Thursday December 06, 2012. 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.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6567539	BH43			23/11/2012
6567546	BH99			23/11/2012
6567549	BH100			23/11/2012
6567543	BH41A			23/11/2012
6567555	BH42A			23/11/2012
6567544	BH41A(DUPLICATE)			23/11/2012
6567556	BH42A(DUPLICATE)			23/11/2012
6567541	BH41A-NP			23/11/2012
6567553	BH42A-NP			23/11/2012
6567542	BH41A-NP(DUPLICATE)			23/11/2012
6567554	BH42A-NP(DUPLICATE)			23/11/2012
6567534	BH34B			23/11/2012
6567535	BH34B(DUPLICATE)			23/11/2012
6567531	BH34B-NP			23/11/2012
6567540	BH43(DUPLICATE)			23/11/2012
6567536	BH43-NP			23/11/2012
6567537	BH43-NP(DUPLICATE)			23/11/2012
6567533	BH348-NP(DUPLICATE)			23/11/2012
6567557	TRIP BLANK			23/11/2012

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

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			6567539	BH43			1l green glass bottle
			6567546	BH99			Vial (ALE297)
			6567549	BH100			1l green glass bottle
			6567543	BH41A			Vial (ALE297)
			6567555	BH42A			1l green glass bottle
			6567541	BH41A-NP			Vial (ALE297)
			6567553	BH42A-NP			1l green glass bottle
			6567534	BH34B			Vial (ALE297)
			6567531	BH34B-NP			Vial (ALE297)
			6567536	BH43-NP			1l green glass bottle
							Vial (ALE297)
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 10	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 10		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8	X				X	X	X	X	X	X	X	X	X	X	X	X	X	

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH43	BH99	BH100	BH41A	BH42A	BH41A-NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567546	6567549	6567543	6567555	6567541
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		154 #	64.3 #	<46 #	1060 #	20200 #	409 #

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH42A-NP	BH34B	BH34B-NP	BH43-NP		
			Depth (m)	.	.	.	.		
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012		
			Sample Time	.	.	.	.		
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012		
			SDG Ref	121128-12	121128-12	121128-12	121128-12		
			Lab Sample No.(s)	6567553	6567534	6567531	6567536		
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		27900 #	52.8 #	60.8 #	104 #		

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH43	BH99	BH100	BH41A	BH42A	BH41A-NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567546	6567549	6567543	6567555	6567541
			AGS Reference						
GRO >C5-C12	<50 µg/l	TM245		145 § #	<50 § #	<50 § #	<50 § #	267 #	<50 § #
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245		<3 § #	<3 § #	<3 § #	<3 § #	<3 #	<3 § #
Benzene	<7 µg/l	TM245		<7 § #	<7 § #	<7 § #	<7 § #	<7 #	<7 § #
Toluene	<4 µg/l	TM245		<4 § #	<4 § #	<4 § #	<4 § #	<4 #	<4 § #
Ethylbenzene	<5 µg/l	TM245		<5 § #	<5 § #	<5 § #	<5 § #	<5 #	<5 § #
m,p-Xylene	<8 µg/l	TM245		<8 § #	<8 § #	<8 § #	<8 § #	<8 #	<8 § #
o-Xylene	<3 µg/l	TM245		<3 § #	<3 § #	<3 § #	<3 § #	<3 #	<3 § #
Sum of detected Xylenes	<11 µg/l	TM245		<11 §	<11 §	<11 §	<11 §	<11	<11 §
Sum of detected BTEX	<28 µg/l	TM245		<28 §	<28 §	<28 §	<28 §	<28	<28 §

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH42A-NP	BH34B	BH34B-NP	BH43-NP		
			Depth (m)	.	.	.	.		
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012		
			Sample Time	.	.	.	.		
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012		
			SDG Ref	121128-12	121128-12	121128-12	121128-12		
			Lab Sample No.(s)	6567553	6567534	6567531	6567536		
			AGS Reference						
GRO >C5-C12	<50 µg/l	TM245		1380 § #	<50 § #	<50 § #	50 § #		
Methyl tertiary butyl ether (MTBE)	<3 µg/l	TM245		<3 § #	<3 § #	<3 § #	<3 § #		
Benzene	<7 µg/l	TM245		10 § #	<7 § #	<7 § #	<7 § #		
Toluene	<4 µg/l	TM245		<4 § #	<4 § #	<4 § #	<4 § #		
Ethylbenzene	<5 µg/l	TM245		<5 § #	<5 § #	<5 § #	<5 § #		
m,p-Xylene	<8 µg/l	TM245		<8 § #	<8 § #	<8 § #	<8 § #		
o-Xylene	<3 µg/l	TM245		<3 § #	<3 § #	<3 § #	<3 § #		
Sum of detected Xylenes	<11 µg/l	TM245		<11 §	<11 §	<11 §	<11 §		
Sum of detected BTEX	<28 µg/l	TM245		<28 §	<28 §	<28 §	<28 §		

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH43	BH41A	BH42A	BH41A-NP	BH42A-NP	BH34B
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567543	6567555	6567541	6567553	6567534
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1	2.4	<1	<1	<1
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	1.5	<1	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2	<2	<2	<2	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH43	BH41A	BH42A	BH41A-NP	BH42A-NP	BH34B
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567543	6567555	6567541	6567553	6567534
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5	<5	<5	<5
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Fluorene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pentachlorophenol (aq)	<1 µg/l	TM176		<4	<4	<4	<4	<4	<4
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Naphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	6.73	<1	<1	<1
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pyrene (aq)	<1 µg/l	TM176		<1	<1	1.81	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS accredited.
§	Deviating sample.
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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed

Component	LOD/Units	Method	Customer Sample R	BH34B-NP	BH43-NP				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	23/11/2012	23/11/2012				
			Sample Time	.	.				
			Date Received	27/11/2012	27/11/2012				
			SDG Ref	121128-12	121128-12				
			Lab Sample No.(s)	6567531	6567536				
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1				
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1				
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1				
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1				
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1				
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1				
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1				
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1				
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1				
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
Azobenzene (aq)	<1 µg/l	TM176		<1	<1				
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1				
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1				
Anthracene (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2				
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1				

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend		Customer Sample R	BH34B-NP	BH43-NP				
#	ISO17025 accredited.							
M	*m*CERTS accredited.							
§	Deviating sample.	Depth (m)	.	.				
aq	Aqueous / settled sample.	Sample Type	Water(GW/SW)	Water(GW/SW)				
diss.filt	Dissolved / filtered sample.	Date Sampled	23/11/2012	23/11/2012				
tot.unfilt	Total / unfiltered sample.	Sample Time	.	.				
*	Subcontracted test.	Date Received	27/11/2012	27/11/2012				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	SDG Ref	121128-12	121128-12				
		Lab Sample No.(s)	6567531	6567536				
(F)	Trigger breach confirmed	AGS Reference						

Component	LOD/Units	Method						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176	<1	<1				
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176	<1	<1				
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176	<1	<1				
Benzo(a)pyrene (aq)	<1 µg/l	TM176	<1	<1				
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176	<1	<1				
Carbazole (aq)	<1 µg/l	TM176	<1	<1				
Chrysene (aq)	<1 µg/l	TM176	<1	<1				
Dibenzofuran (aq)	<1 µg/l	TM176	<1	<1				
n-Dibutyl phthalate (aq)	<1 µg/l	TM176	<1	<1				
Diethyl phthalate (aq)	<1 µg/l	TM176	<1	<1				
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176	<1	<1				
Dimethyl phthalate (aq)	<1 µg/l	TM176	<1	<1				
n-Dioctyl phthalate (aq)	<5 µg/l	TM176	<5	<5				
Fluoranthene (aq)	<1 µg/l	TM176	<1	<1				
Fluorene (aq)	<1 µg/l	TM176	<1	<1				
Hexachlorobenzene (aq)	<1 µg/l	TM176	<1	<1				
Hexachlorobutadiene (aq)	<1 µg/l	TM176	<1	<1				
Pentachlorophenol (aq)	<1 µg/l	TM176	<4	<4				
Phenol (aq)	<1 µg/l	TM176	<1	<1				
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176	<1	<1				
Hexachloroethane (aq)	<1 µg/l	TM176	<1	<1				
Nitrobenzene (aq)	<1 µg/l	TM176	<1	<1				
Naphthalene (aq)	<1 µg/l	TM176	<1	<1				
Isophorone (aq)	<1 µg/l	TM176	<1	<1				
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176	<1	<1				
Phenanthrene (aq)	<1 µg/l	TM176	<1	<1				
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176	<1	<1				
Pyrene (aq)	<1 µg/l	TM176	<1	<1				

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Notification of Deviating Samples

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
6581048	BH100		LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
6581048	BH100		LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
6581048	BH100		LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
6581048	BH100		LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
6581048	BH100		LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
6581048	BH100		LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
6581048	BH100		LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
6581048	BH100		LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
6581048	BH100		LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis
6581084	BH41A		LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
6581084	BH41A		LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
6581084	BH41A		LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
6581084	BH41A		LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
6581084	BH41A		LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
6581084	BH41A		LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
6581084	BH41A		LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
6581084	BH41A		LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
6581084	BH41A		LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis
6581138	BH99		LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
6581138	BH99		LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
6581138	BH99		LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
6581138	BH99		LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
6581138	BH99		LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
6581138	BH99		LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
6581138	BH99		LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
6581138	BH99		LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
6581138	BH99		LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis
6581153	BH42A-NP		LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
6581153	BH42A-NP		LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
6581153	BH42A-NP		LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
6581153	BH42A-NP		LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
6581153	BH42A-NP		LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
6581153	BH42A-NP		LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
6581153	BH42A-NP		LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
6581153	BH42A-NP		LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
6581153	BH42A-NP		LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
6581187	BH43		LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
6581187	BH43		LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
6581187	BH43		LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
6581187	BH43		LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
6581187	BH43		LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
6581187	BH43		LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
6581187	BH43		LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
6581187	BH43		LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
6581187	BH43		LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis
6581200	BH41A-NP		LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
6581200	BH41A-NP		LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
6581200	BH41A-NP		LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
6581200	BH41A-NP		LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
6581200	BH41A-NP		LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
6581200	BH41A-NP		LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
6581200	BH41A-NP		LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
6581200	BH41A-NP		LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
6581200	BH41A-NP		LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis
6581222	BH34B		LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
6581222	BH34B		LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
6581222	BH34B		LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
6581222	BH34B		LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
6581222	BH34B		LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
6581222	BH34B		LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
6581222	BH34B		LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
6581222	BH34B		LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
6581222	BH34B		LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis
6581232	BH43-NP		LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis
6581232	BH43-NP		LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
6581232	BH43-NP		LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
6581232	BH43-NP		LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
6581232	BH43-NP		LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
6581232	BH43-NP		LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
6581232	BH43-NP		LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
6581232	BH43-NP		LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
6581232	BH43-NP		LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis
6581255	BH34B-NP		LIQUID	GRO by GC-FID (W)	Benzene	Container with Headspace provided for volatiles analysis

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Sample Number	Customer Sample Ref.	Depth (m)	Matrix	Test Name	Component Name	Comment
6581255	BH34B-NP		LIQUID	GRO by GC-FID (W)	Ethylbenzene	Container with Headspace provided for volatiles analysis
6581255	BH34B-NP		LIQUID	GRO by GC-FID (W)	GRO >C5-C12	Container with Headspace provided for volatiles analysis
6581255	BH34B-NP		LIQUID	GRO by GC-FID (W)	m,p-Xylene	Container with Headspace provided for volatiles analysis
6581255	BH34B-NP		LIQUID	GRO by GC-FID (W)	Methyl tertiary butyl ether (MTBE)	Container with Headspace provided for volatiles analysis
6581255	BH34B-NP		LIQUID	GRO by GC-FID (W)	o-Xylene	Container with Headspace provided for volatiles analysis
6581255	BH34B-NP		LIQUID	GRO by GC-FID (W)	Sum of detected BTEX	Container with Headspace provided for volatiles analysis
6581255	BH34B-NP		LIQUID	GRO by GC-FID (W)	Sum of detected Xylenes	Container with Headspace provided for volatiles analysis
6581255	BH34B-NP		LIQUID	GRO by GC-FID (W)	Toluene	Container with Headspace provided for volatiles analysis

Note : Test results may be compromised

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6567539	6567546	6567549	6567543	6567555	6567541	6567553	6567534	6567531	6567536
Customer Sample Ref.	BH43	BH99	BH100	BH41A	BH42A	BH41A-NP	BH42A-NP	BH34B	BH34B-NP	BH43-NP
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	05-Dec-2012	05-Dec-2012	05-Dec-2012	04-Dec-2012	05-Dec-2012	05-Dec-2012	05-Dec-2012	05-Dec-2012	05-Dec-2012	05-Dec-2012
GRO by GC-FID (W)	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012
SVOC MS (W) - Aqueous	06-Dec-2012			06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	204663
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Appendix

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5 -C12 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.

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
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 AROCLOR 1254 / PCB CON	D&C	HEXANE:ACETONE	END OVER END	GC-MS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANE:ACETONE	MICROWAVE TM218.	GC-MS
>C6-C40	WET	HEXANE:ACETONE	SHAKER	GC-FID
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANE:ACETONE	SHAKER	GC-FID
SEMI VOLATILE ORGANIC COMPOUNDS	WET	DCM:ACETONE	SONICATE	GC-MS

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 AROCLOR 1254	HEXANE	STIRRED EXTRACTION (STIR-BAR)	GC MS
SVOC	DCM	LIQUID/LIQUID SHAKE	GC MS
FREE SULPHUR	DCM	SOLID PHASE EXTRACTION	HPLC
PESTOCP/OPP	DCM	LIQUID/LIQUID SHAKE	GC MS
TRIAZINE HERBS	DCM	LIQUID/LIQUID SHAKE	GC MS
PHENOLS MS	ACETONE	SOLID PHASE EXTRACTION	GC MS
TPH by INFRARED (IR)	TCE	STIRRED EXTRACTION (STIR-BAR)	IR
MINERAL OIL by IR	TCE	STIRRED EXTRACTION (STIR-BAR)	IR
GLYCOLS	NONE	DIRECT INJECTION	GC FID

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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Attention: Adrian Green

CERTIFICATE OF ANALYSIS

Date:	11 December 2012
Customer:	H_RPS_ADB
Sample Delivery Group (SDG):	121128-12
Your Reference:	JER5575U
Location:	SHLNG
Report No:	205185

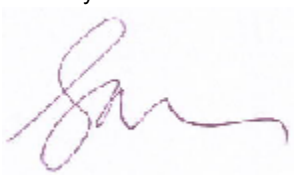
This report has been revised and directly supersedes 205137 in its entirety.

We received 19 samples on Tuesday November 27, 2012 and 10 of these samples were scheduled for analysis which was completed on Tuesday December 11, 2012. 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.

Approved By:



Sonia McWhan
Operations Manager

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CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6567539	BH43			23/11/2012
6567546	BH99			23/11/2012
6567549	BH100			23/11/2012
6567543	BH41A			23/11/2012
6567555	BH42A			23/11/2012
6567544	BH41A(DUPLICATE)			23/11/2012
6567556	BH42A(DUPLICATE)			23/11/2012
6567541	BH41A-NP			23/11/2012
6567553	BH42A-NP			23/11/2012
6567542	BH41A-NP(DUPLICATE)			23/11/2012
6567554	BH42A-NP(DUPLICATE)			23/11/2012
6567534	BH34B			23/11/2012
6567535	BH34B(DUPLICATE)			23/11/2012
6567531	BH34B-NP			23/11/2012
6567540	BH43(DUPLICATE)			23/11/2012
6567536	BH43-NP			23/11/2012
6567537	BH43-NP(DUPLICATE)			23/11/2012
6567533	BH348-NP(DUPLICATE)			23/11/2012
6567557	TRIP BLANK			23/11/2012

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

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

LIQUID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 10	6567539	BH43			1l green glass bottle
			6567546	BH99			Vial (ALE297)
			6567549	BH100			1l green glass bottle
			6567543	BH41A			Vial (ALE297)
			6567555	BH42A			1l green glass bottle
			6567541	BH41A-NP			Vial (ALE297)
			6567553	BH42A-NP			1l green glass bottle
			6567534	BH34B			Vial (ALE297)
			6567531	BH34B-NP			1l green glass bottle
			6567536	BH43-NP			Vial (ALE297)
GRO by GC-FID (W)	All	NDPs: 0 Tests: 10					
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8					

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH43	BH99	BH100	BH41A	BH42A	BH41A-NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567546	6567549	6567543	6567555	6567541
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		154 #	64.3 #	<46 #	1060 #	20200 #	409 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		17.4	36	<10	390	5040	118
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		137	28.3	<10	670	15200	291

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH42A-NP	BH34B	BH34B-NP	BH43-NP		
			Depth (m)	.	.	.	.		
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012		
			Sample Time	.	.	.	.		
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012		
			SDG Ref	121128-12	121128-12	121128-12	121128-12		
			Lab Sample No.(s)	6567553	6567534	6567531	6567536		
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		27900 #	52.8 #	60.8 #	104 #		
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		6940	31.9	39.2	22.1		
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		21000	20.9	21.6	82		

CERTIFICATE OF ANALYSIS

SDG: 121128-12 **Location:** SHLNG **Order Number:**
Job: H_RPS_ADB-8 **Customer:** RPS Consultants Ltd **Report Number:** 205185
Client Reference: JER5575U **Attention:** Adrian Green **Superseded Report:** 205137

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH43	BH99	BH100	BH41A	BH42A	BH41A-NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567546	6567549	6567543	6567555	6567541
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C8-C10	<10 µg/l	TM245		22	<10	<10	<10	36	<10
GRO >C5-C10	<10 µg/l	TM245		25	<10	<10	<10	38	<10

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

GRO by GC-FID (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH42A-NP	BH34B	BH34B-NP	BH43-NP		
			Depth (m)	.	.	.	.		
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012		
			Sample Time	.	.	.	.		
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012		
			SDG Ref	121128-12	121128-12	121128-12	121128-12		
			Lab Sample No.(s)	6567553	6567534	6567531	6567536		
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10		
GRO >C6-C8	<10 µg/l	TM245		41	<10	<10	<10		
GRO >C8-C10	<10 µg/l	TM245		205	<10	<10	13		
GRO >C5-C10	<10 µg/l	TM245		254	<10	<10	15		

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH43	BH41A	BH42A	BH41A-NP	BH42A-NP	BH34B
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567543	6567555	6567541	6567553	6567534
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1	2.4	<1	<1	<1
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	1.5	<1	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2	<2	<2	<2	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH43	BH41A	BH42A	BH41A-NP	BH42A-NP	BH34B
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567543	6567555	6567541	6567553	6567534
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5	<5	<5	<5
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Fluorene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pentachlorophenol (aq)	<1 µg/l	TM176		<4	<4	<4	<4	<4	<4
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Naphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	6.73	<1	<1	<1
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pyrene (aq)	<1 µg/l	TM176		<1	<1	1.81	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH34B-NP	BH43-NP				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	23/11/2012	23/11/2012				
			Sample Time	.	.				
			Date Received	27/11/2012	27/11/2012				
			SDG Ref	121128-12	121128-12				
			Lab Sample No.(s)	6567531	6567536				
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1				
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1				
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1				
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1				
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1				
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1				
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1				
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1				
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1				
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
Azobenzene (aq)	<1 µg/l	TM176		<1	<1				
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1				
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1				
Anthracene (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2				
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1				

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH34B-NP	BH43-NP				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	23/11/2012	23/11/2012				
			Sample Time	.	.				
			Date Received	27/11/2012	27/11/2012				
			SDG Ref	121128-12	121128-12				
			Lab Sample No.(s)	6567531	6567536				
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1				
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1				
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1				
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1				
Carbazole (aq)	<1 µg/l	TM176		<1	<1				
Chrysene (aq)	<1 µg/l	TM176		<1	<1				
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1				
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1				
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5				
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1				
Fluorene (aq)	<1 µg/l	TM176		<1	<1				
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1				
Pentachlorophenol (aq)	<1 µg/l	TM176		<4	<4				
Phenol (aq)	<1 µg/l	TM176		<1	<1				
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1				
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1				
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1				
Naphthalene (aq)	<1 µg/l	TM176		<1	<1				
Isophorone (aq)	<1 µg/l	TM176		<1	<1				
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1				
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1				
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1				
Pyrene (aq)	<1 µg/l	TM176		<1	<1				

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Test Completion Dates

Lab Sample No(s)	6567539	6567546	6567549	6567543	6567555	6567541	6567553	6567534	6567531	6567536
Customer Sample Ref.	BH43	BH99	BH100	BH41A	BH42A	BH41A-NP	BH42A-NP	BH34B	BH34B-NP	BH43-NP
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012
GRO by GC-FID (W)	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012
SVOC MS (W) - Aqueous	06-Dec-2012			06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5 -C12 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.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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RPS Consultants Ltd
2420 The Quadrant
Aztec West
Almondsbury
Bristol
BS32 4AQ

Attention: Adrian Green

CERTIFICATE OF ANALYSIS

Date:	11 December 2012
Customer:	H_RPS_ADB
Sample Delivery Group (SDG):	121128-12
Your Reference:	JER5575U
Location:	SHLNG
Report No:	205185

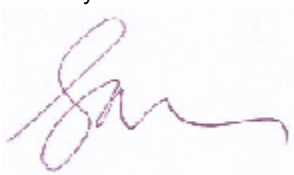
This report has been revised and directly supersedes 205137 in its entirety.

We received 19 samples on Tuesday November 27, 2012 and 10 of these samples were scheduled for analysis which was completed on Tuesday December 11, 2012. 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.

Approved By:



Sonia McWhan
Operations Manager

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Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No. 4057291.

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6567539	BH43			23/11/2012
6567546	BH99			23/11/2012
6567549	BH100			23/11/2012
6567543	BH41A			23/11/2012
6567555	BH42A			23/11/2012
6567544	BH41A(DUPLICATE)			23/11/2012
6567556	BH42A(DUPLICATE)			23/11/2012
6567541	BH41A-NP			23/11/2012
6567553	BH42A-NP			23/11/2012
6567542	BH41A-NP(DUPLICATE)			23/11/2012
6567554	BH42A-NP(DUPLICATE)			23/11/2012
6567534	BH34B			23/11/2012
6567535	BH34B(DUPLICATE)			23/11/2012
6567531	BH34B-NP			23/11/2012
6567540	BH43(DUPLICATE)			23/11/2012
6567536	BH43-NP			23/11/2012
6567537	BH43-NP(DUPLICATE)			23/11/2012
6567533	BH348-NP(DUPLICATE)			23/11/2012
6567557	TRIP BLANK			23/11/2012

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

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

LIQUID

Results Legend

X Test

N No Determination Possible

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 10	6567539	BH43			1l green glass bottle
			6567546	BH99			Vial (ALE297)
			6567549	BH100			1l green glass bottle
			6567543	BH41A			Vial (ALE297)
			6567555	BH42A			1l green glass bottle
			6567541	BH41A-NP			Vial (ALE297)
			6567553	BH42A-NP			1l green glass bottle
			6567534	BH34B			Vial (ALE297)
			6567531	BH34B-NP			1l green glass bottle
			6567536	BH43-NP			Vial (ALE297)
GRO by GC-FID (W)	All	NDPs: 0 Tests: 10					
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 8					

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH43	BH99	BH100	BH41A	BH42A	BH41A-NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567546	6567549	6567543	6567555	6567541
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		154 #	64.3 #	<46 #	1060 #	20200 #	409 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		17.4	36	<10	390	5040	118
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		137	28.3	<10	670	15200	291

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH42A-NP	BH34B	BH34B-NP	BH43-NP		
			Depth (m)	.	.	.	.		
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012		
			Sample Time	.	.	.	.		
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012		
			SDG Ref	121128-12	121128-12	121128-12	121128-12		
			Lab Sample No.(s)	6567553	6567534	6567531	6567536		
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		27900 #	52.8 #	60.8 #	104 #		
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		6940	31.9	39.2	22.1		
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		21000	20.9	21.6	82		

CERTIFICATE OF ANALYSIS

SDG: 121128-12 **Location:** SHLNG **Order Number:**
Job: H_RPS_ADB-8 **Customer:** RPS Consultants Ltd **Report Number:** 205185
Client Reference: JER5575U **Attention:** Adrian Green **Superseded Report:** 205137

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH43	BH99	BH100	BH41A	BH42A	BH41A-NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567546	6567549	6567543	6567555	6567541
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C8-C10	<10 µg/l	TM245		22	<10	<10	<10	36	<10
GRO >C5-C10	<10 µg/l	TM245		25	<10	<10	<10	38	<10

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

GRO by GC-FID (W)

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH42A-NP	BH34B	BH34B-NP	BH43-NP		
			Depth (m)	.	.	.	.		
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012		
			Sample Time	.	.	.	.		
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012		
			SDG Ref	121128-12	121128-12	121128-12	121128-12		
			Lab Sample No.(s)	6567553	6567534	6567531	6567536		
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10		
GRO >C6-C8	<10 µg/l	TM245		41	<10	<10	<10		
GRO >C8-C10	<10 µg/l	TM245		205	<10	<10	13		
GRO >C5-C10	<10 µg/l	TM245		254	<10	<10	15		

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH43	BH41A	BH42A	BH41A-NP	BH42A-NP	BH34B
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567543	6567555	6567541	6567553	6567534
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1	2.4	<1	<1	<1
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	1.5	<1	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2	<2	<2	<2	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH43	BH41A	BH42A	BH41A-NP	BH42A-NP	BH34B
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012	23/11/2012
			Sample Time	.	.	.	.	.	.
			Date Received	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012	27/11/2012
			SDG Ref	121128-12	121128-12	121128-12	121128-12	121128-12	121128-12
			Lab Sample No.(s)	6567539	6567543	6567555	6567541	6567553	6567534
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5	<5	<5	<5
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Fluorene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pentachlorophenol (aq)	<1 µg/l	TM176		<4	<4	<4	<4	<4	<4
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Naphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	6.73	<1	<1	<1
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pyrene (aq)	<1 µg/l	TM176		<1	<1	1.81	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

SVOC MS (W) - Aqueous

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH34B-NP	BH43-NP				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	23/11/2012	23/11/2012				
			Sample Time	.	.				
			Date Received	27/11/2012	27/11/2012				
			SDG Ref	121128-12	121128-12				
			Lab Sample No.(s)	6567531	6567536				
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1				
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1				
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1				
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1				
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1				
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1				
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1				
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1				
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1				
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1				
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1				
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1				
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1				
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1				
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1				
Azobenzene (aq)	<1 µg/l	TM176		<1	<1				
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1				
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1				
Anthracene (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1				
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2				
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1				

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample Ref.	BH34B-NP	BH43-NP				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	23/11/2012	23/11/2012				
			Sample Time	.	.				
			Date Received	27/11/2012	27/11/2012				
			SDG Ref	121128-12	121128-12				
			Lab Sample No.(s)	6567531	6567536				
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1				
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1				
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1				
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1				
Carbazole (aq)	<1 µg/l	TM176		<1	<1				
Chrysene (aq)	<1 µg/l	TM176		<1	<1				
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1				
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1				
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1				
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5				
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1				
Fluorene (aq)	<1 µg/l	TM176		<1	<1				
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1				
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1				
Pentachlorophenol (aq)	<1 µg/l	TM176		<4	<4				
Phenol (aq)	<1 µg/l	TM176		<1	<1				
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1				
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1				
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1				
Naphthalene (aq)	<1 µg/l	TM176		<1	<1				
Isophorone (aq)	<1 µg/l	TM176		<1	<1				
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1				
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1				
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1				
Pyrene (aq)	<1 µg/l	TM176		<1	<1				

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Test Completion Dates

Lab Sample No(s)	6567539	6567546	6567549	6567543	6567555	6567541	6567553	6567534	6567531	6567536
Customer Sample Ref.	BH43	BH99	BH100	BH41A	BH42A	BH41A-NP	BH42A-NP	BH34B	BH34B-NP	BH43-NP
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012	10-Dec-2012
GRO by GC-FID (W)	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012	30-Nov-2012
SVOC MS (W) - Aqueous	06-Dec-2012			06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012	06-Dec-2012

SDG:	121128-12	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205185
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	205137

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5 -C12 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.

Sample Deviations

1	Container with Headspace provided for volatiles analysis
2	Incorrect container received
3	Deviation from method
4	Holding time exceeded before sample received
§	Sampled on date not provided
♦	Sample holding time exceeded in laboratory
@	Sample holding time exceeded due to sampled on date
&	Sample Holding Time exceeded - Late arrival of instructions.

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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Attention: Adrian Green

CERTIFICATE OF ANALYSIS

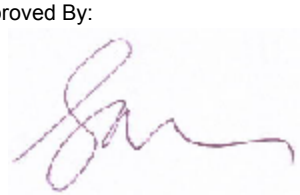
Date:	17 December 2012
Customer:	H_RPS_ADB
Sample Delivery Group (SDG):	121205-78
Your Reference:	JER5575U
Location:	SHLNG
Report No:	205917

We received 15 samples on Tuesday December 04, 2012 and 8 of these samples were scheduled for analysis which was completed on Monday December 17, 2012. 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.

Approved By:



Sonia McWhan

Operations Manager

ALcontrol Laboratories is a trading division of ALcontrol UK Limited
Registered Office: Units 7 & 8 Hawarden Business Park, Manor Road, Hawarden, Deeside, CH5 3US. Registered in England and Wales No.

CERTIFICATE OF ANALYSIS

SDG:	121205-78	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205917
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6607875	BH20			03/12/2012
6607869	BH22			03/12/2012
6607860	BH26			03/12/2012
6607865	BH53			03/12/2012
6608223	BH20 DUPLICATE			03/12/2012
6607868	BH22 DUPLICATE			03/12/2012
6607867	BH26 DUPLICATE			03/12/2012
6607863	BH53 DUPLICATE			03/12/2012
6607873	BH22NP			03/12/2012
6607872	BH26NP			03/12/2012
6607864	BH53NP			03/12/2012
6607862	BH20NP DUPLICATE			03/12/2012
6607874	BH22NP DUPLICATE			03/12/2012
6607870	BH26NP DUPLICATE			03/12/2012
6607866	BH53NP DUPLICATE			03/12/2012

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

CERTIFICATE OF ANALYSIS

SDG:	121205-78	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205917
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 8	6607875	BH20			1l green glass bottle
			6607869	BH22			Vial (ALE297)
			6607860	BH26			1l green glass bottle
			6607865	BH53			Vial (ALE297)
			6607873	BH22NP			1l green glass bottle
			6607872	BH26NP			Vial (ALE297)
			6607864	BH53NP			1l green glass bottle
			6607862	BH20NP DUPLICATE			Vial (ALE297)
GRO by GC-FID (W)	All	NDPs: 0 Tests: 8	6607875	BH20			1l green glass bottle
			6607869	BH22			Vial (ALE297)
			6607860	BH26			1l green glass bottle
			6607865	BH53			Vial (ALE297)
			6607873	BH22NP			1l green glass bottle
			6607872	BH26NP			Vial (ALE297)
			6607864	BH53NP			1l green glass bottle
			6607862	BH20NP DUPLICATE			Vial (ALE297)

CERTIFICATE OF ANALYSIS

SDG:	121205-78	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205917
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH20	BH22	BH26	BH53	BH22NP	BH26NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	03/12/2012	03/12/2012	03/12/2012	03/12/2012	03/12/2012	03/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012
			SDG Ref	121205-78	121205-78	121205-78	121205-78	121205-78	121205-78
			Lab Sample No.(s)	6607875	6607869	6607860	6607865	6607873	6607872
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		582 #	323 #	212 #	664 #	376 #	281 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		18.3	<10	<10	16.1	17.9	<10
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		564	313	212	647	357	281

CERTIFICATE OF ANALYSIS

SDG:	121205-78	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205917
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Customer Sample R			BH53NP	BH20NP DUPLICAT E				
Depth (m)			.	.				
Sample Type			Water(GW/SW)	Water(GW/SW)				
Date Sampled			03/12/2012	03/12/2012				
Sample Time			.	.				
Date Received			04/12/2012	04/12/2012				
SDG Ref			121205-78	121205-78				
Lab Sample No.(s)			6607864	6607862				
AGS Reference								
Component	**LOD/Units**	**Method**						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172	324 #	447 #				
EPH Band >C21-C35 (aq)	<10 µg/l	TM172	<10	27.9				
EPH Band >C10-C21 (aq)	<10 µg/l	TM172	324	418				

CERTIFICATE OF ANALYSIS

SDG:	121205-78	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205917
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH20	BH22	BH26	BH53	BH22NP	BH26NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	03/12/2012	03/12/2012	03/12/2012	03/12/2012	03/12/2012	03/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012
			SDG Ref	121205-78	121205-78	121205-78	121205-78	121205-78	121205-78
			Lab Sample No.(s)	6607875	6607869	6607860	6607865	6607873	6607872
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C8-C10	<10 µg/l	TM245		20	<10	<10	19	21	<10
GRO >C5-C10	<10 µg/l	TM245		21	<10	<10	20	22	<10

CERTIFICATE OF ANALYSIS

SDG:	121205-78	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205917
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH53NP	BH20NP DUPLICAT E				
			Depth (m)	.	.				
			Sample Type	Water(GW/SW)	Water(GW/SW)				
			Date Sampled	03/12/2012	03/12/2012				
			Sample Time	.	.				
			Date Received	04/12/2012	04/12/2012				
			SDG Ref	121205-78	121205-78				
			Lab Sample No.(s)	6607864	6607862				
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10				
GRO >C6-C8	<10 µg/l	TM245		<10	<10				
GRO >C8-C10	<10 µg/l	TM245		17	<10				
GRO >C5-C10	<10 µg/l	TM245		18	<10				

CERTIFICATE OF ANALYSIS

SDG:	121205-78	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205917
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	121205-78	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205917
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6607875	6607869	6607860	6607865	6607873	6607872	6607864	6607862
Customer Sample Ref.	BH20	BH22	BH26	BH53	BH22NP	BH26NP	BH53NP	BH20NP DUPLICATE
AGS Ref.								
Depth								
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	17-Dec-2012
GRO by GC-FID (W)	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012

SDG:	121205-78	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	205917
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5-C12 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.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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RPS Consultants Ltd
2420 The Quadrant
Aztec West
Almondsbury
Bristol
BS32 4AQ

Attention: Adrian Green

CERTIFICATE OF ANALYSIS

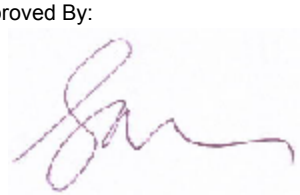
Date:	18 December 2012
Customer:	H_RPS_ADB
Sample Delivery Group (SDG):	121206-113
Your Reference:	JER5575U
Location:	SHLNG
Report No:	206249

We received 31 samples on Thursday December 06, 2012 and 16 of these samples were scheduled for analysis which was completed on Tuesday December 18, 2012. 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.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6617186	BH01			05/12/2012
6617165	BH19			05/12/2012
6617135	BH49			05/12/2012
6617158	BH50			05/12/2012
6617141	BH65			05/12/2012
6617171	BH199			05/12/2012
6617174	BH200			05/12/2012
6617153	BH61a			05/12/2012
6617154	BH61a DUPLICATE			05/12/2012
6617151	BH61a NP			05/12/2012
6617152	BH61a NP DUPLICATE			05/12/2012
6617147	BH60b			05/12/2012
6617148	BH60b DUPLICATE			05/12/2012
6617144	BH60b NP			05/12/2012
6617146	BH60b NP DUPLICATE			05/12/2012
6617192	BH01 DUPLICATE			05/12/2012
6617168	BH19 DUPLICATE			05/12/2012
6617137	BH49 DUPLICATE			05/12/2012
6617159	BH50 DUPLICATE			05/12/2012
6617143	BH65 DUPLICATE			05/12/2012
6617177	BH01 NP			05/12/2012
6617160	BH19 NP			05/12/2012
6617131	BH49 NP			05/12/2012
6617156	BH50 NP			05/12/2012
6617138	BH65 NP			05/12/2012
6617180	BH01 NP DUPLICATE			05/12/2012
6617161	BH19 NP DUPLICATE			05/12/2012
6617133	BH49 NP DUPLICATE			05/12/2012
6617157	BH50 NP DUPLICATE			05/12/2012
6617139	BH65 NP DUPLICATE			05/12/2012
6617194	TRIP BLANK			

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

CERTIFICATE OF ANALYSIS

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 16	6617186	BH01			1l green glass bottle
			6617165	BH19			Vial (ALE297)
			6617135	BH49			1l green glass bottle
			6617158	BH50			Vial (ALE297)
			6617141	BH65			1l green glass bottle
			6617171	BH199			Vial (ALE297)
			6617174	BH200			1l green glass bottle
			6617153	BH61a			Vial (ALE297)
			6617151	BH61a NP			1l green glass bottle
			6617147	BH60b			Vial (ALE297)
			6617144	BH60b NP			1l green glass bottle
			6617177	BH01 NP			Vial (ALE297)
			6617160	BH19 NP			1l green glass bottle
			6617131	BH49 NP			Vial (ALE297)
			6617156	BH50 NP			1l green glass bottle
			6617138	BH65 NP			Vial (ALE297)
GRO by GC-FID (W)	All	NDPs: 0 Tests: 16					

CERTIFICATE OF ANALYSIS

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH01	BH19	BH49	BH50	BH65	BH199
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012
			SDG Ref	121206-113	121206-113	121206-113	121206-113	121206-113	121206-113
			Lab Sample No.(s)	6617186	6617165	6617135	6617158	6617141	6617171
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		135 #	94.2 #	214 #	2720 #	182 #	<46 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		<10	<10	<10	198	<10	<10
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		135	94.2	214	2520	182	<10

CERTIFICATE OF ANALYSIS

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH200	BH61a	BH61a NP	BH60b	BH60b NP	BH01 NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012
			SDG Ref	121206-113	121206-113	121206-113	121206-113	121206-113	121206-113
			Lab Sample No.(s)	6617174	6617153	6617151	6617147	6617144	6617177
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		127 #	1690 #	1660 #	132 #	220 #	163 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		<10	272	231	<10	<10	<10
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		127	1420	1430	132	220	163

CERTIFICATE OF ANALYSIS

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH19 NP	BH49 NP	BH50 NP	BH65 NP		
			Depth (m)	.	.	.	.		
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
			Date Sampled	05/12/2012	05/12/2012	05/12/2012	05/12/2012		
			Sample Time	.	.	.	.		
			Date Received	06/12/2012	06/12/2012	06/12/2012	06/12/2012		
			SDG Ref	121206-113	121206-113	121206-113	121206-113		
			Lab Sample No.(s)	6617160	6617131	6617156	6617138		
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		107 #	312 #	224 #	196 #		
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		<10	14.1	45.2	<10		
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		107	298	179	196		

CERTIFICATE OF ANALYSIS

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH01	BH19	BH49	BH50	BH65	BH199
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012
			SDG Ref	121206-113	121206-113	121206-113	121206-113	121206-113	121206-113
			Lab Sample No.(s)	6617186	6617165	6617135	6617158	6617141	6617171
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	86	<10	<10
GRO >C8-C10	<10 µg/l	TM245		<10	<10	<10	1650	<10	<10
GRO >C5-C10	<10 µg/l	TM245		<10	<10	<10	1750	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH200	BH61a	BH61a NP	BH60b	BH60b NP	BH01 NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012
			SDG Ref	121206-113	121206-113	121206-113	121206-113	121206-113	121206-113
			Lab Sample No.(s)	6617174	6617153	6617151	6617147	6617144	6617177
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	11	13	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	646	495	<10	<10	<10
GRO >C8-C10	<10 µg/l	TM245		<10	166	166	<10	<10	<10
GRO >C5-C10	<10 µg/l	TM245		<10	823	674	<10	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH19 NP	BH49 NP	BH50 NP	BH65 NP		
			Depth (m)	.	.	.	.		
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)		
			Date Sampled	05/12/2012	05/12/2012	05/12/2012	05/12/2012		
			Sample Time	.	.	.	.		
			Date Received	06/12/2012	06/12/2012	06/12/2012	06/12/2012		
			SDG Ref	121206-113	121206-113	121206-113	121206-113		
			Lab Sample No.(s)	6617160	6617131	6617156	6617138		
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10 1	<10	<10 1		
GRO >C6-C8	<10 µg/l	TM245		<10	<10 1	<10	<10 1		
GRO >C8-C10	<10 µg/l	TM245		<10	<10 1	<10	<10 1		
GRO >C5-C10	<10 µg/l	TM245		<10	<10 1	<10	<10 1		

CERTIFICATE OF ANALYSIS

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6617186	6617165	6617135	6617158	6617141	6617171	6617174	6617153	6617151	6617147
Customer Sample Ref.	BH01	BH19	BH49	BH50	BH65	BH199	BH200	BH61a	BH61a NP	BH60b
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	17-Dec-2012	17-Dec-2012	17-Dec-2012	17-Dec-2012	17-Dec-2012	14-Dec-2012	17-Dec-2012	17-Dec-2012	17-Dec-2012	17-Dec-2012
GRO by GC-FID (W)	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012

Lab Sample No(s)	6617177	6617160	6617131	6617156	6617138	6617144
Customer Sample Ref.	BH01 NP	BH19 NP	BH49 NP	BH50 NP	BH65 NP	BH60b NP
AGS Ref.						
Depth						
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	17-Dec-2012	17-Dec-2012	17-Dec-2012	17-Dec-2012	17-Dec-2012	17-Dec-2012
GRO by GC-FID (W)	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012

SDG:	121206-113	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206249
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5-C12 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.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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Website: www.alcontrol.com

RPS Consultants Ltd
2420 The Quadrant
Aztec West
Almondsbury
Bristol
BS32 4AQ

Attention: Adrian Green

CERTIFICATE OF ANALYSIS

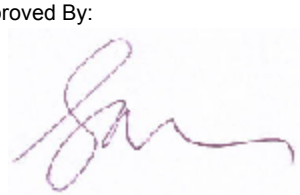
Date:	18 December 2012
Customer:	H_RPS_ADB
Sample Delivery Group (SDG):	121206-89
Your Reference:	JER5575U
Location:	SHLNG
Report No:	206250

We received 24 samples on Wednesday December 05, 2012 and 12 of these samples were scheduled for analysis which was completed on Tuesday December 18, 2012. 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.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	121206-89	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206250
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6615509	BH18			04/12/2012
6615536	BH55			04/12/2012
6615520	BH59			04/12/2012
6615514	BH27A			04/12/2012
6615543	BH47A			04/12/2012
6615515	BH27A DUPLICATE			04/12/2012
6615545	BH47A DUPLICATE			04/12/2012
6615517	BH27A NP			04/12/2012
6615548	BH47A NP			04/12/2012
6615518	BH27A NP DUPLICATE			04/12/2012
6615550	BH47A NP DUPLICATE			04/12/2012
6615525	BH36B			04/12/2012
6615527	BH36B DUPLICATE			04/12/2012
6615529	BH36B NP			04/12/2012
6615534	BH36B NP DUPLICATE			04/12/2012
6615510	BH18 DUPLICATE			04/12/2012
6615537	BH55 DUPLICATE			04/12/2012
6615521	BH59 DUPLICATE			04/12/2012
6615511	BH18 NP			04/12/2012
6615540	BH55 NP			04/12/2012
6615522	BH59 NP			04/12/2012
6615512	BH18 NP DUPLICATE			04/12/2012
6615541	BH55 NP DUPLICATE			04/12/2012
6615523	BH59 NP DUPLICATE			04/12/2012

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

CERTIFICATE OF ANALYSIS

SDG:	121206-89	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206250
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 12	6615509	BH18			1l green glass bottle
			6615536	BH55			Vial (ALE297)
			6615520	BH59			1l green glass bottle
			6615514	BH27A			Vial (ALE297)
			6615543	BH47A			1l green glass bottle
			6615517	BH27A NP			Vial (ALE297)
			6615548	BH47A NP			1l green glass bottle
			6615525	BH36B			Vial (ALE297)
			6615529	BH36B NP			1l green glass bottle
			6615511	BH18 NP			Vial (ALE297)
			6615540	BH55 NP			1l green glass bottle
			6615522	BH59 NP			Vial (ALE297)
			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 12		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	121206-89	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206250
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH18	BH55	BH59	BH27A	BH47A	BH27A NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012
			SDG Ref	121206-89	121206-89	121206-89	121206-89	121206-89	121206-89
			Lab Sample No.(s)	6615509	6615536	6615520	6615514	6615543	6615517
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		208 #	277 #	183 #	225 #	283 #	439 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		<10	<10	<10	<10	59	18.5
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		208	277	183	225	224	421

CERTIFICATE OF ANALYSIS

SDG:	121206-89	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206250
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH47A NP	BH36B	BH36B NP	BH18 NP	BH55 NP	BH59 NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012
			SDG Ref	121206-89	121206-89	121206-89	121206-89	121206-89	121206-89
			Lab Sample No.(s)	6615548	6615525	6615529	6615511	6615540	6615522
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		278 #	252 #	202 #	398 #	214 #	209 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		50.1	<10	<10	15.9	<10	<10
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		228	252	202	382	214	209

CERTIFICATE OF ANALYSIS

SDG:	121206-89	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206250
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH18	BH55	BH59	BH27A	BH47A	BH27A NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012
			SDG Ref	121206-89	121206-89	121206-89	121206-89	121206-89	121206-89
			Lab Sample No.(s)	6615509	6615536	6615520	6615514	6615543	6615517
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10 1	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	<10 1	<10	<10
GRO >C8-C10	<10 µg/l	TM245		<10	<10	<10	11 1	<10	<10
GRO >C5-C10	<10 µg/l	TM245		<10	<10	<10	12 1	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	121206-89	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206250
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH47A NP	BH36B	BH36B NP	BH18 NP	BH55 NP	BH59 NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012	04/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012	05/12/2012
			SDG Ref	121206-89	121206-89	121206-89	121206-89	121206-89	121206-89
			Lab Sample No.(s)	6615548	6615525	6615529	6615511	6615540	6615522
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C8-C10	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C5-C10	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	121206-89	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206250
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	121206-89	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206250
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6615509	6615536	6615520	6615511	6615514	6615543	6615517	6615548	6615525	6615529
Customer Sample Ref.	BH18	BH55	BH59	BH18 NP	BH27A	BH47A	BH27A NP	BH47A NP	BH36B	BH36B NP
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012	14-Dec-2012
GRO by GC-FID (W)	18-Dec-2012	18-Dec-2012	17-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012

Lab Sample No(s)	6615540	6615522
Customer Sample Ref.	BH55 NP	BH59 NP
AGS Ref.		
Depth		
Type	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	14-Dec-2012	14-Dec-2012
GRO by GC-FID (W)	18-Dec-2012	18-Dec-2012

SDG:	121206-89	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206250
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5-C12 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.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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RPS Consultants Ltd
2420 The Quadrant
Aztec West
Almondsbury
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BS32 4AQ

Attention: Adrian Green

CERTIFICATE OF ANALYSIS

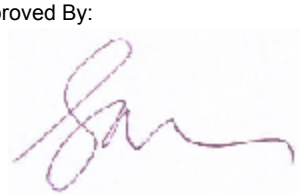
Date:	19 December 2012
Customer:	H_RPS_ADB
Sample Delivery Group (SDG):	121209-20
Your Reference:	JER5575U
Location:	SHLNG
Report No:	206453

We received 22 samples on Saturday December 08, 2012 and 12 of these samples were scheduled for analysis which was completed on Wednesday December 19, 2012. 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.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6633589	BH43			07/12/2012
6633580	BH30a			07/12/2012
6633578	BH41a			07/12/2012
6633601	BH42a			07/12/2012
6633581	BH30a DUPLICATE			07/12/2012
6633596	BH41a DUPLICATE			07/12/2012
6633597	BH42a DUPLICATE			07/12/2012
6633602	BH30a NP			07/12/2012
6633582	BH41a NP			07/12/2012
6633598	BH42a NP			07/12/2012
6633606	BH30a NP DUPLICATE			07/12/2012
6633579	BH41a NP DUPLICATE			07/12/2012
6633599	BH42a NP DUPLICATE			07/12/2012
6633593	BH45b			07/12/2012
6633584	BH45b DUPLICATE			07/12/2012
6633595	BH45b NP			07/12/2012
6633583	BH45b NP DUPLICATE			07/12/2012
6633586	BHG2b			07/12/2012
6633590	BHG2b DUPLICATE			07/12/2012
6633588	BHG2b NP			07/12/2012
6633587	BHG2b NP DUPLICATE			07/12/2012
6633585	BH43 NP			07/12/2012

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

CERTIFICATE OF ANALYSIS

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			6633589	BH43			1l green glass bottle
			6633589	BH43			Vial (ALE297)
			6633580	BH30a			1l green glass bottle
			6633580	BH30a			Vial (ALE297)
			6633578	BH41a			1l green glass bottle
			6633578	BH41a			Vial (ALE297)
			6633601	BH42a			1l green glass bottle
			6633601	BH42a			Vial (ALE297)
			6633602	BH30a NP			1l green glass bottle
			6633602	BH30a NP			Vial (ALE297)
			6633582	BH41a NP			1l green glass bottle
			6633582	BH41a NP			Vial (ALE297)
			6633598	BH42a NP			1l green glass bottle
			6633598	BH42a NP			Vial (ALE297)
			6633593	BH45b			1l green glass bottle
			6633593	BH45b			Vial (ALE297)
			6633595	BH45b NP			1l green glass bottle
			6633595	BH45b NP			Vial (ALE297)
			6633586	BHG2b			1l green glass bottle
			6633586	BHG2b			Vial (ALE297)
			6633588	BHG2b NP			1l green glass bottle
			6633588	BHG2b NP			Vial (ALE297)
			6633585	BH43 NP			1l green glass bottle
			6633585	BH43 NP			Vial (ALE297)
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 12	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 6	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH30a	BH41a	BH42a	BH30a NP	BH41a NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012
			SDG Ref	121209-20	121209-20	121209-20	121209-20	121209-20	121209-20
			Lab Sample No.(s)	6633589	6633580	6633578	6633601	6633602	6633582
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		419 #	<46 #	1960 #	3660 #	<46 #	424 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		33.3	<10	679	882	<10	154
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		386	<10	1280	2780	<10	272

CERTIFICATE OF ANALYSIS

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH42a NP	BH45b	BH45b NP	BHG2b	BHG2b NP	BH43 NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012
			SDG Ref	121209-20	121209-20	121209-20	121209-20	121209-20	121209-20
			Lab Sample No.(s)	6633598	6633593	6633595	6633586	6633588	6633585
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		3490 #	224 #	210 #	<46 #	51.8 #	505 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		752	155	140	<10	36.3	44.3
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		2740	68.8	70	<10	15.4	462

CERTIFICATE OF ANALYSIS

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH30a	BH41a	BH42a	BH30a NP	BH41a NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012
			SDG Ref	121209-20	121209-20	121209-20	121209-20	121209-20	121209-20
			Lab Sample No.(s)	6633589	6633580	6633578	6633601	6633602	6633582
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	11	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	50	<10	<10
GRO >C8-C10	<10 µg/l	TM245		48	<10	<10	176	<10	<10
GRO >C5-C10	<10 µg/l	TM245		50	<10	<10	237	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH42a NP	BH45b	BH45b NP	BHG2b	BHG2b NP	BH43 NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012
			SDG Ref	121209-20	121209-20	121209-20	121209-20	121209-20	121209-20
			Lab Sample No.(s)	6633598	6633593	6633595	6633586	6633588	6633585
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		12	<10	<10	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		52	<10	<10	<10	<10	<10
GRO >C8-C10	<10 µg/l	TM245		57	<10	<10	<10	<10	30
GRO >C5-C10	<10 µg/l	TM245		121	<10	<10	<10	<10	32

CERTIFICATE OF ANALYSIS

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH41a	BH42a	BH41a NP	BH42a NP	BH43 NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012
			SDG Ref	121209-20	121209-20	121209-20	121209-20	121209-20	121209-20
			Lab Sample No.(s)	6633589	6633578	6633601	6633582	6633598	6633585
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	1.75	<1	1.26	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	9.53	<1	3.29	<1
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1	1.07	<1	1.17	<1
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2	<2	<2	<2	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH41a	BH42a	BH41a NP	BH42a NP	BH43 NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012	08/12/2012
			SDG Ref	121209-20	121209-20	121209-20	121209-20	121209-20	121209-20
			Lab Sample No.(s)	6633589	6633578	6633601	6633582	6633598	6633585
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5	<5	<5	<5
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Fluorene (aq)	<1 µg/l	TM176		<1	<1	2.16	<1	1.94	<1
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Naphthalene (aq)	<1 µg/l	TM176		<1	<1	3.13	<1	2.22	<1
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	3.25	<1	2.22	<1
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6633589	6633580	6633578	6633601	6633602	6633582	6633598	6633593	6633595	6633586
Customer Sample Ref.	BH43	BH30a	BH41a	BH42a	BH30a NP	BH41a NP	BH42a NP	BH45b	BH45b NP	BHG2b
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012
GRO by GC-FID (W)	19-Dec-2012	19-Dec-2012	19-Dec-2012	19-Dec-2012	19-Dec-2012	19-Dec-2012	19-Dec-2012	19-Dec-2012	19-Dec-2012	19-Dec-2012
SVOC MS (W) - Aqueous	18-Dec-2012		17-Dec-2012	17-Dec-2012		17-Dec-2012	18-Dec-2012			

Lab Sample No(s)	6633585	6633588
Customer Sample Ref.	BH43 NP	BHG2b NP
AGS Ref.		
Depth		
Type	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	18-Dec-2012	18-Dec-2012
GRO by GC-FID (W)	19-Dec-2012	19-Dec-2012
SVOC MS (W) - Aqueous	18-Dec-2012	

SDG:	121209-20	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206453
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5-C12 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.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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BS32 4AQ

Attention: Adrian Green

CERTIFICATE OF ANALYSIS

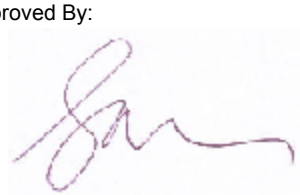
Date:	19 December 2012
Customer:	H_RPS_ADB
Sample Delivery Group (SDG):	121209-9
Your Reference:	JER5575U
Location:	SHLNG
Report No:	206273

We received 30 samples on Friday December 07, 2012 and 14 of these samples were scheduled for analysis which was completed on Wednesday December 19, 2012. 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.

Approved By:



Sonia McWhan

Operations Manager

ilac-MRA UKAS TESTING 1291

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6633122	BH06			06/12/2012
6633109	BH44			06/12/2012
6633110	BH40a			06/12/2012
6633104	BH63a			06/12/2012
6633113	BH40a DUPLICATE			06/12/2012
6633119	BH63a DUPLICATE			06/12/2012
6633114	BH40a NP			06/12/2012
6633118	BH63a NP			06/12/2012
6633112	BH40a NP DUPLICATE			06/12/2012
6633117	BH63a NP DUPLICATE			06/12/2012
6633120	BH34b			06/12/2012
6633121	BH34b DUPLICATE			06/12/2012
6633123	BH34b NP			06/12/2012
6633126	BH34b NP DUPLICATE			06/12/2012
6633125	BH06 DUPLICATE			06/12/2012
6633128	BH43 DUPLICATE			06/12/2012
6633108	BH44 DUPLICATE			06/12/2012
6633095	BH06 NP			06/12/2012
6633115	BH44 NP			06/12/2012
6633096	BH06 NP DUPLICATE			06/12/2012
6633116	BH43 NP DUPLICATE			06/12/2012
6633111	BH44 NP DUPLICATE			06/12/2012
6633099	MW1			06/12/2012
6633092	MW3			06/12/2012
6633101	MW1 DUPLICATE			06/12/2012
6633091	MW3 DUPLICATE			06/12/2012
6633097	MW1 NP			06/12/2012
6633093	MW3 NP			06/12/2012
6633098	MW1 NP DUPLICATE			06/12/2012
6633094	MW3 NP DUPLICATE			06/12/2012

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

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 14	6633122	BH06			1l green glass bottle
			6633109	BH44			Vial (ALE297)
			6633110	BH40a			1l green glass bottle
			6633104	BH63a			Vial (ALE297)
			6633114	BH40a NP			1l green glass bottle
			6633118	BH63a NP			Vial (ALE297)
			6633120	BH34b			1l green glass bottle
			6633123	BH34b NP			Vial (ALE297)
			6633095	BH06 NP			1l green glass bottle
			6633115	BH44 NP			Vial (ALE297)
			6633099	MW1			1l green glass bottle
			6633092	MW3			Vial (ALE297)
			6633097	MW1 NP			1l green glass bottle
			6633093	MW3 NP			Vial (ALE297)
GRO by GC-FID (W)	All	NDPs: 0 Tests: 14					
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 6					

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend

#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	Depth (m)	Sample Type	Date Sampled	Sample Time	Date Received	SDG Ref	Lab Sample No.(s)	AGS Reference
			BH06	.	Water(GW/SW)	06/12/2012	.	07/12/2012	121209-9	6633122	
			BH44	.	Water(GW/SW)	06/12/2012	.	07/12/2012	121209-9	6633109	
			BH40a	.	Water(GW/SW)	06/12/2012	.	07/12/2012	121209-9	6633110	
			BH63a	.	Water(GW/SW)	06/12/2012	.	07/12/2012	121209-9	6633104	
			BH40a NP	.	Water(GW/SW)	06/12/2012	.	07/12/2012	121209-9	6633114	
			BH63a NP	.	Water(GW/SW)	06/12/2012	.	07/12/2012	121209-9	6633118	
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172	90.2 #	<46 #	6150 #	<46 #	561 #	<46 #			
EPH Band >C21-C35 (aq)	<10 µg/l	TM172	47.9	46.2	5640	<10	521	<10			
EPH Band >C10-C21 (aq)	<10 µg/l	TM172	42.2	<10	526	<10	40.5	<10			

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34b	BH34b NP	BH06 NP	BH44 NP	MW1	MW3
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			SDG Ref	121209-9	121209-9	121209-9	121209-9	121209-9	121209-9
			Lab Sample No.(s)	6633120	6633123	6633095	6633115	6633099	6633092
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		92.1 #	71.9 #	93.5 #	<46 #	<46 #	179 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		51.5	39.5	44.5	<10	30.5	68.4
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		40.6	32.4	49.2	<10	15.5	110

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	MW1 NP	MW3 NP
			Depth (m)	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)
			Date Sampled	06/12/2012	06/12/2012
			Sample Time	.	.
			Date Received	07/12/2012	07/12/2012
			SDG Ref	121209-9	121209-9
			Lab Sample No.(s)	6633097	6633093
			AGS Reference		
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		48.1 #	213 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		32.9	106
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		15.2	107

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH06	BH44	BH40a	BH63a	BH40a NP	BH63a NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			SDG Ref	121209-9	121209-9	121209-9	121209-9	121209-9	121209-9
			Lab Sample No.(s)	6633122	6633109	6633110	6633104	6633114	6633118
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C8-C10	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C5-C10	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34b	BH34b NP	BH06 NP	BH44 NP	MW1	MW3
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			SDG Ref	121209-9	121209-9	121209-9	121209-9	121209-9	121209-9
			Lab Sample No.(s)	6633120	6633123	6633095	6633115	6633099	6633092
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C8-C10	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C5-C10	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend		Customer Sample R	MW1 NP	MW3 NP				
#	ISO17025 accredited.							
M	*m*CERTS accredited.							
aq	Aqueous / settled sample.	Depth (m)	.	.				
diss.filt	Dissolved / filtered sample.	Sample Type	Water(GW/SW)	Water(GW/SW)				
tot.unfilt	Total / unfiltered sample.	Date Sampled	06/12/2012	06/12/2012				
*	Subcontracted test.	Sample Time	.	.				
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Date Received	07/12/2012	07/12/2012				
		SDG Ref	121209-9	121209-9				
(F)	Trigger breach confirmed	Lab Sample No.(s)	6633097	6633093				
1-4&+§@	Sample deviation (see appendix)	AGS Reference						

Component	LOD/Units	Method						
GRO >C5-C6	<10 µg/l	TM245	<10	<10				
GRO >C6-C8	<10 µg/l	TM245	<10	<10				
GRO >C8-C10	<10 µg/l	TM245	<10	<10				
GRO >C5-C10	<10 µg/l	TM245	<10	<10				

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34b	BH34b NP	MW1	MW3	MW1 NP	MW3 NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			SDG Ref	121209-9	121209-9	121209-9	121209-9	121209-9	121209-9
			Lab Sample No.(s)	6633120	6633123	6633099	6633092	6633097	6633093
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2	<2	<2	<2	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34b	BH34b NP	MW1	MW3	MW1 NP	MW3 NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012	06/12/2012
			Sample Time	.	.	.	.	.	.
			Date Received	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012	07/12/2012
			SDG Ref	121209-9	121209-9	121209-9	121209-9	121209-9	121209-9
			Lab Sample No.(s)	6633120	6633123	6633099	6633092	6633097	6633093
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5	<5	<5	<5
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Fluorene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<10	<1	<10
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Naphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<10	<1	<10
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6633122	6633109	6633095	6633115	6633110	6633104	6633114	6633118	6633120	6633123
Customer Sample Ref.	BH06	BH44	BH06 NP	BH44 NP	BH40a	BH63a	BH40a NP	BH63a NP	BH34b	BH34b NP
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	17-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012
GRO by GC-FID (W)	18-Dec-2012	19-Dec-2012	19-Dec-2012	18-Dec-2012	18-Dec-2012	19-Dec-2012	19-Dec-2012	18-Dec-2012	18-Dec-2012	18-Dec-2012
SVOC MS (W) - Aqueous									18-Dec-2012	18-Dec-2012

Lab Sample No(s)	6633099	6633092	6633097	6633093
Customer Sample Ref.	MW1	MW3	MW1 NP	MW3 NP
AGS Ref.				
Depth				
Type	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	17-Dec-2012	18-Dec-2012	17-Dec-2012	18-Dec-2012
GRO by GC-FID (W)	18-Dec-2012	18-Dec-2012	19-Dec-2012	19-Dec-2012
SVOC MS (W) - Aqueous	17-Dec-2012	18-Dec-2012	17-Dec-2012	18-Dec-2012

SDG:	121209-9	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	206273
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5-C12 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.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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RPS Consultants Ltd
2420 The Quadrant
Aztec West
Almondsbury
Bristol
BS32 4AQ

Attention: Adrian Green

CERTIFICATE OF ANALYSIS

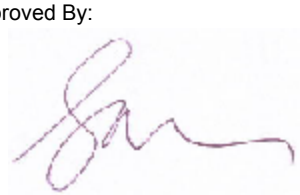
Date:	29 January 2013
Customer:	H_RPS_ADB
Sample Delivery Group (SDG):	130120-11
Your Reference:	JER5575U
Location:	SHLNG
Report No:	210126

We received 19 samples on Friday January 18, 2013 and 9 of these samples were scheduled for analysis which was completed on Tuesday January 29, 2013. 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.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6797632	BH43			16/01/2013
6797648	BH99			16/01/2013
6797637	BH41A			16/01/2013
6797641	BH42A			16/01/2013
6797638	BH41A DUPLICATE			16/01/2013
6797642	BH42A DUPLICATE			16/01/2013
6797634	BH41ANP			16/01/2013
6797639	BH42ANP			16/01/2013
6797635	BH41ANP DUPLICATE			16/01/2013
6797640	BH42ANP DUPLICATE			16/01/2013
6797645	BH34B			16/01/2013
6797647	BH34B DUPLICATE			16/01/2013
6797643	BH34BNP			16/01/2013
6797644	BH34BNP DUPLICATE			16/01/2013
6797633	BH43 DUPLICATE			16/01/2013
6797649	BH99 DUPLICATE			16/01/2013
6797629	BH43NP			16/01/2013
6797630	BH43NP DUPLICATE			16/01/2013
6797650	TRIP BLANK			16/01/2013

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

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

		Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
EPH (DRO) (C10-C40) Aqueous (W)	All	6797632	BH43			1l green glass bottle
	NDPs: 0 Tests: 9	6797648	BH99			Vial (ALE297)
		6797637	BH41A			1l green glass bottle
		6797641	BH42A			Vial (ALE297)
		6797634	BH41ANP			1l green glass bottle
		6797639	BH42ANP			Vial (ALE297)
		6797645	BH34B			1l green glass bottle
		6797643	BH34BNP			Vial (ALE297)
		6797629	BH43NP			1l green glass bottle
						Vial (ALE297)
GRO by GC-FID (W)	All					
	NDPs: 0 Tests: 9					
SVOC MS (W) - Aqueous	All					
	NDPs: 0 Tests: 9					

	6797632	6797648	6797637	6797641	6797634	6797639	6797645	6797643	6797629
	BH43	BH99	BH41A	BH42A	BH41ANP	BH42ANP	BH34B	BH34BNP	BH43NP
	1l green glass bottle	Vial (ALE297)	1l green glass bottle	Vial (ALE297)	1l green glass bottle	Vial (ALE297)	1l green glass bottle	Vial (ALE297)	1l green glass bottle	Vial (ALE297)
EPH (DRO) (C10-C40) Aqueous (W)	X	X	X	X	X	X	X	X	X	
GRO by GC-FID (W)		X	X	X	X	X	X	X	X	X
SVOC MS (W) - Aqueous	X	X	X	X	X	X	X	X	X	

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH99	BH41A	BH42A	BH41ANP	BH42ANP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/01/2013	16/01/2013	16/01/2013	16/01/2013	16/01/2013	16/01/2013
			Sample Time	.	.	.	.	.	.
			Date Received	18/01/2013	18/01/2013	18/01/2013	18/01/2013	18/01/2013	18/01/2013
			SDG Ref	130120-11	130120-11	130120-11	130120-11	130120-11	130120-11
			Lab Sample No.(s)	6797632	6797648	6797637	6797641	6797634	6797639
			AGS Reference	M-Jan13	M-Jan13	M-Jan13	M-Jan13	M-Jan13	M-Jan13
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		469 #	522 #	1680 #	35400 #	1270 #	3640 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		53.9	59.7	525	8510	382	909
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		415	461	1160	26900	889	2730

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34B	BH34BNP	BH43NP			
			Depth (m)	.	.	.			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	16/01/2013	16/01/2013	16/01/2013			
			Sample Time	.	.	.			
			Date Received	18/01/2013	18/01/2013	18/01/2013			
			SDG Ref	130120-11	130120-11	130120-11			
			Lab Sample No.(s)	6797645	6797643	6797629			
			AGS Reference	M-Jan13	M-Jan13	M-Jan13			
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		330 #	385 #	438 #			
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		59.7	72.3	41.3			
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		270	313	397			

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH99	BH41A	BH42A	BH41ANP	BH42ANP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/01/2013	16/01/2013	16/01/2013	16/01/2013	16/01/2013	16/01/2013
			Sample Time	.	.	.	.	.	.
			Date Received	18/01/2013	18/01/2013	18/01/2013	18/01/2013	18/01/2013	18/01/2013
			SDG Ref	130120-11	130120-11	130120-11	130120-11	130120-11	130120-11
			Lab Sample No.(s)	6797632	6797648	6797637	6797641	6797634	6797639
			AGS Reference	M-Jan13	M-Jan13	M-Jan13	M-Jan13	M-Jan13	M-Jan13
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	10	<10	10
GRO >C8-C10	<10 µg/l	TM245		37	57	15	65	<10	59
GRO >C5-C10	<10 µg/l	TM245		39	60	17	81	<10	76

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34B	BH34BNP	BH43NP			
			Depth (m)	.	.	.			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	16/01/2013	16/01/2013	16/01/2013			
			Sample Time	.	.	.			
			Date Received	18/01/2013	18/01/2013	18/01/2013			
			SDG Ref	130120-11	130120-11	130120-11			
			Lab Sample No.(s)	6797645	6797643	6797629			
			AGS Reference	M-Jan13	M-Jan13	M-Jan13			
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10			
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10			
GRO >C8-C10	<10 µg/l	TM245		16	22	44			
GRO >C5-C10	<10 µg/l	TM245		18	24	46			

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH99	BH41A	BH42A	BH41ANP	BH42ANP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/01/2013	16/01/2013	16/01/2013	16/01/2013	16/01/2013	16/01/2013
			Sample Time	.	.	.	.	.	.
			Date Received	18/01/2013	18/01/2013	18/01/2013	18/01/2013	18/01/2013	18/01/2013
			SDG Ref	130120-11	130120-11	130120-11	130120-11	130120-11	130120-11
			Lab Sample No.(s)	6797632	6797648	6797637	6797641	6797634	6797639
			AGS Reference	M-Jan13	M-Jan13	M-Jan13	M-Jan13	M-Jan13	M-Jan13
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		4.61	<2	2.33	<4	<2	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH99	BH41A	BH42A	BH41ANP	BH42ANP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	16/01/2013	16/01/2013	16/01/2013	16/01/2013	16/01/2013	16/01/2013
			Sample Time	.	.	.	.	.	.
			Date Received	18/01/2013	18/01/2013	18/01/2013	18/01/2013	18/01/2013	18/01/2013
			SDG Ref	130120-11	130120-11	130120-11	130120-11	130120-11	130120-11
			Lab Sample No.(s)	6797632	6797648	6797637	6797641	6797634	6797639
			AGS Reference	M-Jan13	M-Jan13	M-Jan13	M-Jan13	M-Jan13	M-Jan13
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5	<10	<5	<5
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Fluorene (aq)	<1 µg/l	TM176		<1	<1	<1	2.35	<1	<1
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Naphthalene (aq)	<1 µg/l	TM176		1.69	<1	<1	<2	<1	<1
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	<1	3.19	<1	<1
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34B	BH34BNP	BH43NP			
			Depth (m)	.	.	.			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	16/01/2013	16/01/2013	16/01/2013			
			Sample Time	.	.	.			
			Date Received	18/01/2013	18/01/2013	18/01/2013			
			SDG Ref	130120-11	130120-11	130120-11			
			Lab Sample No.(s)	6797645	6797643	6797629			
			AGS Reference	M-Jan13	M-Jan13	M-Jan13			
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1			
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1			
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1			
Acenaphthene (aq)	<1 µg/l	TM176		<1	1.17	<1			
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1			
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1			
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	<1			
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2	<2			
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1			

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34B	BH34BNP	BH43NP			
			Depth (m)	.	.	.			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	16/01/2013	16/01/2013	16/01/2013			
			Sample Time	.	.	.			
			Date Received	18/01/2013	18/01/2013	18/01/2013			
			SDG Ref	130120-11	130120-11	130120-11			
			Lab Sample No.(s)	6797645	6797643	6797629			
			AGS Reference	M-Jan13	M-Jan13	M-Jan13			
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1			
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1			
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1			
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1			
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1			
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1			
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1			
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1			
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1			
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1			
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5			
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1			
Fluorene (aq)	<1 µg/l	TM176		1.07	2.64	<1			
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1			
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1			
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1			
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1			
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
Naphthalene (aq)	<1 µg/l	TM176		<1	<1	<1			
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1			
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1			
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	<1			
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1			
Pyrene (aq)	<1 µg/l	TM176		<1	<1	<1			

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6797632	6797648	6797637	6797641	6797634	6797639	6797645	6797643	6797629
Customer Sample Ref.	BH43	BH99	BH41A	BH42A	BH41ANP	BH42ANP	BH34B	BH34BNP	BH43NP
AGS Ref.									
Depth									
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	28-Jan-2013	28-Jan-2013	28-Jan-2013	28-Jan-2013	28-Jan-2013	28-Jan-2013	28-Jan-2013	28-Jan-2013	28-Jan-2013
GRO by GC-FID (W)	26-Jan-2013	26-Jan-2013	26-Jan-2013	26-Jan-2013	26-Jan-2013	26-Jan-2013	26-Jan-2013	26-Jan-2013	26-Jan-2013
SVOC MS (W) - Aqueous	28-Jan-2013	28-Jan-2013	28-Jan-2013	29-Jan-2013	29-Jan-2013	29-Jan-2013	29-Jan-2013	28-Jan-2013	28-Jan-2013

SDG:	130120-11	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	210126
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5-C12 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.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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Attention: Helen McIntosh

CERTIFICATE OF ANALYSIS

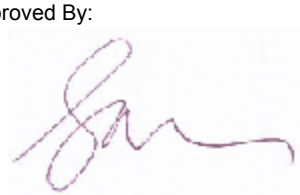
Date:	05 March 2013
Customer:	H_RPS_CHP
Sample Delivery Group (SDG):	130222-93
Your Reference:	JER5575U
Location:	SHLNG
Report No:	214406

We received 19 samples on Thursday February 21, 2013 and 9 of these samples were scheduled for analysis which was completed on Tuesday March 05, 2013. 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.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
6964752	BH43			19/02/2013
6964753	BH99			19/02/2013
6964748	BH41a			19/02/2013
6964750	BH42a			19/02/2013
6964757	BH41a duplicate			19/02/2013
6964763	BH42a duplicate			19/02/2013
6964747	BH41aNP			19/02/2013
6964749	BH42aNP			19/02/2013
6964756	BH41aNP duplicate			19/02/2013
6964761	BH42aNP duplicate			19/02/2013
6964746	BH34b			19/02/2013
6964755	BH34b duplicate			19/02/2013
6964745	BH34bNP			19/02/2013
6964754	BH34bNP duplicate			19/02/2013
6964765	BH43 duplicate			19/02/2013
6964767	BH99 duplicate			19/02/2013
6964751	BH43NP			19/02/2013
6964764	BH43NP duplicate			19/02/2013
6964772	TRIP BLANK			19/02/2013

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

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			6964752	BH43			1l green glass bottle
			6964752	BH43			Vial (ALE297)
			6964753	BH99			1l green glass bottle
			6964753	BH99			Vial (ALE297)
			6964748	BH41a			1l green glass bottle
			6964748	BH41a			Vial (ALE297)
			6964750	BH42a			1l green glass bottle
			6964750	BH42a			Vial (ALE297)
			6964747	BH41aNP			1l green glass bottle
			6964747	BH41aNP			Vial (ALE297)
			6964749	BH42aNP			1l green glass bottle
			6964749	BH42aNP			Vial (ALE297)
			6964746	BH34b			1l green glass bottle
			6964746	BH34b			Vial (ALE297)
			6964745	BH34bNP			1l green glass bottle
			6964745	BH34bNP			Vial (ALE297)
			6964751	BH43NP			1l green glass bottle
			6964751	BH43NP			Vial (ALE297)
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 9	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GRO by GC-FID (W)	All	NDPs: 0 Tests: 9	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 9	X	X	X	X	X	X	X	X	X	X	X	X	X	X

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH99	BH41a	BH42a	BH41aNP	BH42aNP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	19/02/2013	19/02/2013	19/02/2013	19/02/2013	19/02/2013	19/02/2013
			Sample Time	.	.	.	.	.	.
			Date Received	21/02/2013	21/02/2013	21/02/2013	21/02/2013	21/02/2013	21/02/2013
			SDG Ref	130222-93	130222-93	130222-93	130222-93	130222-93	130222-93
			Lab Sample No.(s)	6964752	6964753	6964748	6964750	6964747	6964749
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		259 #	192 #	2640 #	30000 #	464 #	3700 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		19.1	39	960	7450	137	1050
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		240	153	1680	22500	329	2640

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Customer Sample R			BH34b	BH34bNP	BH43NP			
Depth (m)			.	.	.			
Sample Type			Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
Date Sampled			19/02/2013	19/02/2013	19/02/2013			
Sample Time			.	.	.			
Date Received			21/02/2013	21/02/2013	21/02/2013			
SDG Ref			130222-93	130222-93	130222-93			
Lab Sample No.(s)			6964746	6964745	6964751			
AGS Reference								
Component	**LOD/Units**	**Method**						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172	124 #	111 #	278 #			
EPH Band >C21-C35 (aq)	<10 µg/l	TM172	41.4	36.8	<10			
EPH Band >C10-C21 (aq)	<10 µg/l	TM172	82.5	74.2	278			

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH99	BH41a	BH42a	BH41aNP	BH42aNP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	19/02/2013	19/02/2013	19/02/2013	19/02/2013	19/02/2013	19/02/2013
			Sample Time	.	.	.	.	.	.
			Date Received	21/02/2013	21/02/2013	21/02/2013	21/02/2013	21/02/2013	21/02/2013
			SDG Ref	130222-93	130222-93	130222-93	130222-93	130222-93	130222-93
			Lab Sample No.(s)	6964752	6964753	6964748	6964750	6964747	6964749
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	10	<10	<10
GRO >C8-C10	<10 µg/l	TM245		<10	<10	<10	65	<10	81
GRO >C5-C10	<10 µg/l	TM245		<10	11	<10	79	<10	86

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend		Customer Sample R	BH34b	BH34bNP	BH43NP			
#	ISO17025 accredited.	Depth (m)	.	.	.			
M	*m*CERTS accredited.	Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
aq	Aqueous / settled sample.	Date Sampled	19/02/2013	19/02/2013	19/02/2013			
diss.filt	Dissolved / filtered sample.	Sample Time	.	.	.			
tot.unfilt	Total / unfiltered sample.	Date Received	21/02/2013	21/02/2013	21/02/2013			
*	Subcontracted test.	SDG Ref	130222-93	130222-93	130222-93			
**	% recovery of the surrogate standard to check the efficiency of the method. The results of individual compounds within samples aren't corrected for the recovery	Lab Sample No.(s)	6964746	6964745	6964751			
(F)	Trigger breach confirmed	AGS Reference						
1-4&+§@	Sample deviation (see appendix)							

Component	LOD/Units	Method						
GRO >C5-C6	<10 µg/l	TM245	<10	<10	<10			
GRO >C6-C8	<10 µg/l	TM245	<10	<10	<10			
GRO >C8-C10	<10 µg/l	TM245	<10	<10	30			
GRO >C5-C10	<10 µg/l	TM245	<10	<10	32			

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH99	BH41a	BH42a	BH41aNP	BH42aNP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	19/02/2013	19/02/2013	19/02/2013	19/02/2013	19/02/2013	19/02/2013
			Sample Time	.	.	.	.	.	.
			Date Received	21/02/2013	21/02/2013	21/02/2013	21/02/2013	21/02/2013	21/02/2013
			SDG Ref	130222-93	130222-93	130222-93	130222-93	130222-93	130222-93
			Lab Sample No.(s)	6964752	6964753	6964748	6964750	6964747	6964749
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2	<2	<4	<2	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH99	BH41a	BH42a	BH41aNP	BH42aNP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	19/02/2013	19/02/2013	19/02/2013	19/02/2013	19/02/2013	19/02/2013
			Sample Time	.	.	.	.	.	.
			Date Received	21/02/2013	21/02/2013	21/02/2013	21/02/2013	21/02/2013	21/02/2013
			SDG Ref	130222-93	130222-93	130222-93	130222-93	130222-93	130222-93
			Lab Sample No.(s)	6964752	6964753	6964748	6964750	6964747	6964749
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5	<10	<5	<5
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Fluorene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Naphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	<1	4.21	<1	<1
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<2	<1	<1
Pyrene (aq)	<1 µg/l	TM176		<1	<1	1.01	<2	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34b	BH34bNP	BH43NP			
			Depth (m)	.	.	.			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	19/02/2013	19/02/2013	19/02/2013			
			Sample Time	.	.	.			
			Date Received	21/02/2013	21/02/2013	21/02/2013			
			SDG Ref	130222-93	130222-93	130222-93			
			Lab Sample No.(s)	6964746	6964745	6964751			
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1			
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1			
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1			
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1			
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1	<1			
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1			
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1			
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	<1			
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2	<2			
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1			

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34b	BH34bNP	BH43NP			
			Depth (m)	.	.	.			
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)			
			Date Sampled	19/02/2013	19/02/2013	19/02/2013			
			Sample Time	.	.	.			
			Date Received	21/02/2013	21/02/2013	21/02/2013			
			SDG Ref	130222-93	130222-93	130222-93			
			Lab Sample No.(s)	6964746	6964745	6964751			
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1			
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1			
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1			
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1			
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1			
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1			
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1			
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1			
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1			
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1			
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1			
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1			
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5			
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1			
Fluorene (aq)	<1 µg/l	TM176		<1	<1	<1			
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1			
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1			
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1			
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1			
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1			
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1			
Naphthalene (aq)	<1 µg/l	TM176		<1	<1	<1			
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1			
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1			
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	<1			
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1			
Pyrene (aq)	<1 µg/l	TM176		<1	<1	<1			

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	6964752	6964753	6964748	6964750	6964747	6964749	6964746	6964745	6964751
Customer Sample Ref.	BH43	BH99	BH41a	BH42a	BH41aNP	BH42aNP	BH34b	BH34bNP	BH43NP
AGS Ref.									
Depth									
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	05-Mar-2013	04-Mar-2013	05-Mar-2013	05-Mar-2013	05-Mar-2013	05-Mar-2013	05-Mar-2013	05-Mar-2013	05-Mar-2013
GRO by GC-FID (W)	04-Mar-2013	04-Mar-2013	04-Mar-2013	04-Mar-2013	04-Mar-2013	04-Mar-2013	04-Mar-2013	04-Mar-2013	04-Mar-2013
SVOC MS (W) - Aqueous	04-Mar-2013	04-Mar-2013	04-Mar-2013	01-Mar-2013	04-Mar-2013	04-Mar-2013	04-Mar-2013	01-Mar-2013	01-Mar-2013

SDG:	130222-93	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_CHP-30	**Customer:**	RPS Consultants Ltd	**Report Number:**	214406
Client Reference:	JER5575U	**Attention:**	Helen McIntosh	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as "Not detected". If no asbestos fibre types are found all will be reported as "Not detected" and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5-C12 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.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.

ALcontrol Laboratories

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RPS Consultants Ltd
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Aztec West
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BS32 4AQ

Attention: Adrian Green

CERTIFICATE OF ANALYSIS

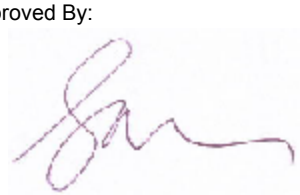
Date:	18 March 2013
Customer:	H_RPS_ADB
Sample Delivery Group (SDG):	130307-75
Your Reference:	JER5575U
Location:	SHLNG
Report No:	216148

We received 38 samples on Thursday March 07, 2013 and 19 of these samples were scheduled for analysis which was completed on Monday March 18, 2013. 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.

Approved By:



Sonia McWhan

Operations Manager

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Received Sample Overview

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
7036180	BH06			05/03/2013
7036173	BH43			05/03/2013
7036185	BH44			05/03/2013
7036203	BH50			05/03/2013
7036178	BH99			05/03/2013
7036169	BH41A			06/03/2013
7036163	BH42A			06/03/2013
7036170	BH41A DUPLICATE			06/03/2013
7036164	BH42A DUPLICATE			06/03/2013
7036171	BH41ANP			06/03/2013
7036165	BH42ANP			06/03/2013
7036172	BH41ANP DUPLICATE			06/03/2013
7036167	BH42ANP DUPLICATE			06/03/2013
7036199	BH34B			05/03/2013
7036200	BH34B DUPLICATE			05/03/2013
7036201	BH34BNP			05/03/2013
7036202	BH34BNP DUPLICATE			05/03/2013
7036181	BH06 DUPLICATE			05/03/2013
7036174	BH43 DUPLICATE			05/03/2013
7036186	BH44 DUPLICATE			05/03/2013
7036204	BH50 DUPLICATE			05/03/2013
7036182	BH06NP			05/03/2013
7036175	BH43NP			05/03/2013
7036188	BH44NP			05/03/2013
7036205	BH50NP			05/03/2013
7036184	BH06NP DUPLICATE			05/03/2013
7036177	BH43NP DUPLICATE			05/03/2013
7036189	BH44NP DUPLICATE			05/03/2013
7036206	BH50NP DUPLICATE			05/03/2013
7036190	MW01			05/03/2013
7036194	MW03			05/03/2013
7036191	MW01 DUPLICATE			05/03/2013
7036195	MW03 DUPLICATE			05/03/2013
7036192	MW01NP			05/03/2013
7036196	MW03NP			05/03/2013
7036193	MW01NP DUPLICATE			05/03/2013
7036197	MW03NP DUPLICATE			05/03/2013
7036207	TRIP BLANK			05/03/2013

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

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

LIQUID

Results Legend

X **Test**

N **No Determination Possible**

			Lab Sample No(s)	Customer Sample Reference	AGS Reference	Depth (m)	Container
			7036180	BH06			1l green glass bottle
			7036173	BH43			1l green glass bottle
			7036185	BH44			Vial (ALE297)
			7036203	BH50			1l green glass bottle
			7036178	BH99			1l green glass bottle
			7036169	BH41A			Vial (ALE297)
			7036163	BH42A			1l green glass bottle
			7036171	BH41ANP			Vial (ALE297)
			7036165	BH42ANP			Vial (ALE297)
			7036199	BH34B			1l green glass bottle
			7036201	BH34BNP			Vial (ALE297)
			7036182	BH06NP			1l green glass bottle
			7036175	BH43NP			Vial (ALE297)
			7036188	BH44NP			1l green glass bottle
			7036205	BH50NP			1l green glass bottle
			7036190	MW01			Vial (ALE297)
			7036194	MW03			1l green glass bottle
			7036192	MW01NP			Vial (ALE297)
			7036196	MW03NP			Vial (ALE297)
EPH (DRO) (C10-C40) Aqueous (W)	All	NDPs: 0 Tests: 19	X	X		X	X	X	X		X		X		X		X		X	X		X	X	X		X		X		
GRO by GC-FID (W)	All	NDPs: 0 Tests: 19	X		X	X	X		X		X		X		X		X		X	X		X	X	X		X		X		X
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 12		X					X		X		X		X		X			X			X		X		X		X	

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH06	BH43	BH44	BH50	BH99	BH41A
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/03/2013	05/03/2013	05/03/2013	05/03/2013	05/03/2013	06/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013
			SDG Ref	130307-75	130307-75	130307-75	130307-75	130307-75	130307-75
			Lab Sample No.(s)	7036180	7036173	7036185	7036203	7036178	7036169
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		77.8 #	270 #	52 #	345 #	254 #	864 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		45.3	<10	50.9	89.8	52.8	311
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		32.3	270	<10	255	201	553

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH42A	BH41ANP	BH42ANP	BH34B	BH34BNP	BH06NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	06/03/2013	06/03/2013	06/03/2013	05/03/2013	05/03/2013	05/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013
			SDG Ref	130307-75	130307-75	130307-75	130307-75	130307-75	130307-75
			Lab Sample No.(s)	7036163	7036171	7036165	7036199	7036201	7036182
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		19500 #	610 #	7260 #	300 #	397 #	66.2 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		4230	205	2180	59.1	58.1	39.2
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		10800	403	5080	241	339	26.8

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43NP	BH44NP	BH50NP	MW01	MW03	MW01NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/03/2013	05/03/2013	05/03/2013	05/03/2013	05/03/2013	05/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013
			SDG Ref	130307-75	130307-75	130307-75	130307-75	130307-75	130307-75
			Lab Sample No.(s)	7036175	7036188	7036205	7036190	7036194	7036192
			AGS Reference						
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172		469 #	<46 #	335 #	<46 #	170 #	<46 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172		<10	<10	90.7	<10	52.9	<10
EPH Band >C10-C21 (aq)	<10 µg/l	TM172		471	<10	244	<10	117	<10

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

	Customer Sample R	MW03NP	
	Depth (m)	.	
	Sample Type	Water(GW/SW)	
	Date Sampled	05/03/2013	
	Sample Time	.	
	Date Received	07/03/2013	
	SDG Ref	130307-75	
	Lab Sample No.(s)	7036196	
	AGS Reference		
Component	**LOD/Units**	**Method**	
EPH Range >C10 - C40 (aq)	<46 µg/l	TM172	151 #
EPH Band >C21-C35 (aq)	<10 µg/l	TM172	47.9
EPH Band >C10-C21 (aq)	<10 µg/l	TM172	103

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH06	BH43	BH44	BH50	BH99	BH41A
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/03/2013	05/03/2013	05/03/2013	05/03/2013	05/03/2013	06/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013
			SDG Ref	130307-75	130307-75	130307-75	130307-75	130307-75	130307-75
			Lab Sample No.(s)	7036180	7036173	7036185	7036203	7036178	7036169
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10 1	<10	<10 2	<10 2	12	<10
GRO >C6-C8	<10 µg/l	TM245		<10 1	<10	<10 2	<10 2	84	<10
GRO >C8-C10	<10 µg/l	TM245		<10 1	51	<10 2	91 2	1340	13
GRO >C5-C10	<10 µg/l	TM245		<10 1	56	<10 2	92 2	1440	17

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH42A	BH41ANP	BH42ANP	BH34B	BH34BNP	BH06NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	06/03/2013	06/03/2013	06/03/2013	05/03/2013	05/03/2013	05/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013
			SDG Ref	130307-75	130307-75	130307-75	130307-75	130307-75	130307-75
			Lab Sample No.(s)	7036163	7036171	7036165	7036199	7036201	7036182
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10 2
GRO >C6-C8	<10 µg/l	TM245		<10	<10	<10	<10	<10	<10 2
GRO >C8-C10	<10 µg/l	TM245		17	11	12	11	10	<10 2
GRO >C5-C10	<10 µg/l	TM245		22	14	16	15	14	<10 2

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43NP	BH44NP	BH50NP	MW01	MW03	MW01NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/03/2013	05/03/2013	05/03/2013	05/03/2013	05/03/2013	05/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013
			SDG Ref	130307-75	130307-75	130307-75	130307-75	130307-75	130307-75
			Lab Sample No.(s)	7036175	7036188	7036205	7036190	7036194	7036192
			AGS Reference						
GRO >C5-C6	<10 µg/l	TM245		<10	<10 2	<10 2	<10	<10	<10
GRO >C6-C8	<10 µg/l	TM245		10	<10 2	<10 2	<10	<10	<10
GRO >C8-C10	<10 µg/l	TM245		57	<10 2	61 2	<10	<10	<10
GRO >C5-C10	<10 µg/l	TM245		72	<10 2	65 2	<10	14	<10

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

GRO by GC-FID (W)

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Customer Sample R			MW03NP
Depth (m)			.
Sample Type			Water(GW/SW)
Date Sampled			05/03/2013
Sample Time			.
Date Received			07/03/2013
SDG Ref			130307-75
Lab Sample No.(s)			7036196
AGS Reference			
Component	**LOD/Units**	**Method**	
GRO >C5-C6	<10 µg/l	TM245	<10
GRO >C6-C8	<10 µg/l	TM245	<10
GRO >C8-C10	<10 µg/l	TM245	<10
GRO >C5-C10	<10 µg/l	TM245	11

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH41A	BH42A	BH41ANP	BH42ANP	BH34B
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/03/2013	06/03/2013	06/03/2013	06/03/2013	06/03/2013	05/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013
			SDG Ref	130307-75	130307-75	130307-75	130307-75	130307-75	130307-75
			Lab Sample No.(s)	7036173	7036169	7036163	7036171	7036165	7036199
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2	12.6	<2	<2	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH43	BH41A	BH42A	BH41ANP	BH42ANP	BH34B
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/03/2013	06/03/2013	06/03/2013	06/03/2013	06/03/2013	05/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013
			SDG Ref	130307-75	130307-75	130307-75	130307-75	130307-75	130307-75
			Lab Sample No.(s)	7036173	7036169	7036163	7036171	7036165	7036199
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5	<5	<5	<5
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Fluorene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	1.15
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Naphthalene (aq)	<1 µg/l	TM176		1.07	<1	<1	<1	<1	<1
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34BNP	BH43NP	MW01	MW03	MW01NP	MW03NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/03/2013	05/03/2013	05/03/2013	05/03/2013	05/03/2013	05/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013
			SDG Ref	130307-75	130307-75	130307-75	130307-75	130307-75	130307-75
			Lab Sample No.(s)	7036201	7036175	7036190	7036194	7036192	7036196
			AGS Reference						
1,2,4-Trichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,2-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,3-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
1,4-Dichlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,5-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4,6-Trichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dichlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dimethylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,4-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2,6-Dinitrotoluene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chloronaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Chlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylnaphthalene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
2-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
3-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Bromophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloro-3-methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chloroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Chlorophenylphenylether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Methylphenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitrophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
4-Nitroaniline (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Azobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Acenaphthene (aq)	<1 µg/l	TM176		1.47	<1	<1	<1	<1	<1
Anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethyl)ether (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Chloroethoxy)methane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
bis(2-Ethylhexyl) phthalate (aq)	<2 µg/l	TM176		<2	<2	<2	<2	<2	<2
Benzo(a)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

SVOC MS (W) - Aqueous

Results Legend	
#	ISO17025 accredited.
M	*m*CERTS 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 individual compounds within samples aren't corrected for the recovery
(F)	Trigger breach confirmed
1-4&+§@	Sample deviation (see appendix)

Component	LOD/Units	Method	Customer Sample R	BH34BNP	BH43NP	MW01	MW03	MW01NP	MW03NP
			Depth (m)	.	.	.	.	.	.
			Sample Type	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)	Water(GW/SW)
			Date Sampled	05/03/2013	05/03/2013	05/03/2013	05/03/2013	05/03/2013	05/03/2013
			Sample Time	.	.	.	.	.	.
			Date Received	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013	07/03/2013
			SDG Ref	130307-75	130307-75	130307-75	130307-75	130307-75	130307-75
			Lab Sample No.(s)	7036201	7036175	7036190	7036194	7036192	7036196
			AGS Reference						
Butylbenzyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(b)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(k)fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(a)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Benzo(g,h,i)perylene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Carbazole (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Chrysene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzofuran (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dibutyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Diethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dibenzo(a,h)anthracene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Dimethyl phthalate (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Dioctyl phthalate (aq)	<5 µg/l	TM176		<5	<5	<5	<5	<5	<5
Fluoranthene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Fluorene (aq)	<1 µg/l	TM176		3.09	<1	<1	<1	<1	<1
Hexachlorobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorobutadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pentachlorophenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenol (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
n-Nitroso-n-dipropylamine (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachloroethane (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Nitrobenzene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Naphthalene (aq)	<1 µg/l	TM176		<1	1.12	<1	<1	<1	<1
Isophorone (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Hexachlorocyclopentadiene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Phenanthrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Indeno(1,2,3-cd)pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1
Pyrene (aq)	<1 µg/l	TM176		<1	<1	<1	<1	<1	<1

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Table of Results - Appendix

Method No	Reference	Description	Wet/Dry Sample [1]	Surrogate Corrected
TM061	Method for the Determination of EPH,Massachusetts Dept.of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)		
TM172	Analysis of Petroleum Hydrocarbons in Environmental Media – Total Petroleum Hydrocarbon Criteria	EPH in Waters		
TM176	EPA 8270D Semi-Volatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS)	Determination of SVOCs in Water by GCMS		
TM245	By GC-FID	Determination of GRO by Headspace in waters		

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

CERTIFICATE OF ANALYSIS

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Test Completion Dates

Lab Sample No(s)	7036180	7036173	7036185	7036203	7036178	7036169	7036163	7036171	7036165	7036199
Customer Sample Ref.	BH06	BH43	BH44	BH50	BH99	BH41A	BH42A	BH41ANP	BH42ANP	BH34B
AGS Ref.										
Depth										
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013
GRO by GC-FID (W)	18-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013
SVOC MS (W) - Aqueous		15-Mar-2013				15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013

Lab Sample No(s)	7036201	7036182	7036175	7036188	7036205	7036190	7036194	7036192	7036196
Customer Sample Ref.	BH34BNP	BH06NP	BH43NP	BH44NP	BH50NP	MW01	MW03	MW01NP	MW03NP
AGS Ref.									
Depth									
Type	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
EPH (DRO) (C10-C40) Aqueous (W)	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013
GRO by GC-FID (W)	13-Mar-2013	18-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013	13-Mar-2013
SVOC MS (W) - Aqueous	15-Mar-2013		15-Mar-2013			15-Mar-2013	15-Mar-2013	15-Mar-2013	15-Mar-2013

SDG:	130307-75	**Location:**	SHLNG	**Order Number:**	
Job:	H_RPS_ADB-8	**Customer:**	RPS Consultants Ltd	**Report Number:**	216148
Client Reference:	JER5575U	**Attention:**	Adrian Green	**Superseded Report:**	

Appendix
General

1. Results are expressed on a dry weight basis (dried at 35ºC) for all soil analyses except for the following: NRA and CEN Leach tests, flash point LOI, pH, ammonium as NH4 by the BRE method, VOC TICS and SVOC 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 all sample types unless the sample is destroyed on testing. The prepared soil sub sample that is analysed for asbestos will be retained for a period of 2 months after the analysis date. All bulk samples 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 analysed in house for the presence of asbestos fibres and asbestos containing material by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If a specific asbestos fibre type is not found this will be reported as “Not detected”. If no asbestos fibre types are found all will be reported as “Not detected” and the sub sample analysed deemed to be clear of asbestos. If an asbestos fibre type is found it will be reported as detected (for each fibre type found). Testing can be carried out on asbestos positive samples, but, due to Health and Safety considerations, may be replaced by alternative tests or reported as No Determination Possible. The quantity of asbestos present is not determined unless specifically requested.

7. If no separate volatile sample is supplied by the client, or if a headspace or sediment is present in the volatile sample, the integrity of the data may be compromised. This will be flagged up as an invalid VOC on the test schedule and the result marked as deviating on the test certificate.

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. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

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 Dimethyphenol, 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 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. 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 C5-C12 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.

Sample Deviations

1	**Container with Headspace provided for volatiles analysis**
2	**Incorrect container received**
3	**Deviation from method**
4	**Holding time exceeded before sample received**
§	**Sampled on date not provided**
♦	**Sample holding time exceeded in laboratory**
@	**Sample holding time exceeded due to sampled on date**
&	**Sample Holding Time exceeded - Late arrival of instructions.**

Asbestos

Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk 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).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has 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).

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

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 HSG 264.

The identification of asbestos containing materials and soils 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.