| Report No | Date |
|---|---|
| 25061/R1 | October 2025 |

Project

# COED D'ARCY – SUB SOIL VERIFICATION REPORT: PLOTS 25 TO 57 AREA 1

Client

**TRJ**

**Spectrum Geo Services**
**Foxglove Cottage,**
**Cwm Risca Lane,**
**Tondu,**
**BRIDGEND**
**CF32 0EH**

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| Report No: | Date: |
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| Project: |
|---|
| **COED D'ARCY – SUB SOIL VERIFICATION REPORT: PLOTS 25 TO 57 AREA 1** |

| Issue Number | Status | Description of Amendments |
|---|---|---|
| 1 | Draft | |
| 2 | Final | |
| | | |
| | | |

| Report prepared by: | |
|---|---|
| Signed  | BSc.(Hons), MSc., FGS, CGeol |

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# FOREWORD

## General Conditions Relating to a Verification Report

*This investigation has been devised to generally comply with the relevant principles and requirements of B.S.10175:2011+A2:2017 'Investigation of potentially contaminated sites - Code of practice', science report SC050021/SR3 'Updated Technical Background to the CLEA Model' (Environment Agency, 2008), and DEFRA/Environment Agency (EA), 2019 'land contamination: risk management'. The recommendations made and opinions expressed in this report are based on the information obtained from the sources described using a methodology intended to provide reasonable consistency and robustness.*

*The opinions expressed in this report are based on the ground conditions revealed by the site works, together with an assessment of the site and of laboratory test results. Whilst opinions may be expressed relating to sub-soil conditions in parts of the site not investigated, for example between exploratory positions, these are only for guidance and no liability can be accepted for their accuracy.*

*Boring and sampling procedures are undertaken in accordance with B.S.5930:2015 +A1:2020 'Code of Practice for Ground Investigations'. Likewise, in-situ and laboratory testing complies with B.S.1377:1990 'Methods of Tests for Soils for Civil Engineering Purposes' and B.S.22475:2011, unless stated otherwise in the text. Chemical testing has been undertaken by a UKAS accredited laboratory.*

*Some items of the investigation have been provided by third parties and whilst Spectrum Geo Services Ltd (SGS) have no reason to doubt the accuracy, the items relied on have not been verified. No responsibility can be accepted for errors within third party items presented in this report.*

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*Any advice, opinions, or recommendations within this document should be read and relied upon only in the context of the document as a whole. The contents of this document are not to be construed as providing legal, business or tax advice or opinion.*

# 1.0 TERMS OF REFERENCE AND INTRODUCTION

## 1.1 Introduction

The work covered by this document was undertaken on behalf of TRJ, in general accordance with and amendment to the following document:

- *BP Area 1 Remediation. Validation Report. 44382729/BRRP0004. URS 18 January 2010*

The work described in this report represents validation and verification of the sub-grade, which had been remediated and previously validated within that report, comprising soil chemistry limits also set out within that report.

## 1.2 Scope of Works

The objectives of this assessment are:

- To physically verify the chemical nature of the sub-soils at Plots 25 to 57, to ensure compliance with the validation suite set out by URS on Page 41 of their Remediation Report (*44382729/BRRP0004).*
- This verification does not include gas membrane validation by others

## 1.3 Development Proposals

It is understood that the intention is to develop the site for the purposes of a residential use, with soft landscaped gardens.

## 1.4 Limitations

Subsoils are inherently variable and by their very nature are hidden from view such that no investigation can be exhaustive to the extent that all soil conditions are revealed. Conditions may therefore be present beneath the site that was not apparent from the data available for review.

Unless specifically noted to the contrary, it should be assumed that this report has not been submitted to any regulatory authorities for approval. Redevelopment sites in particular may have planning conditions attached in respect of contaminated land assessment. Where we are made aware of such conditions in advance of scoping the works, we can tailor the report to the

regulatory authority requirements. Where we are not made aware of any such requirements there can be no certainty that our investigation will meet any or all the regulatory authority requirements.

# 2.0 BACKGROUND INFORMATION

## 2.1 Verification Report Structure

This document has been set out as follows:

• A brief background of the site and nature of the remediation verification planned.

• A description of the activities undertaken.

• Concluding with an assessment of the compliance with the URS validation suites limits.

• Further Recommendations if deemed necessary.

## 2.2 Site Location

The site is located at Coed D'Arcy, the site of the former BP Llandarcy oil refinery.

At the time of the investigation, the site comprised an open area of partially developed residential units.

## 2.3 Previous Reports

The site had been previously reported on within:

- *Integral Geotechnique: Coed D'Arcy – Additional Drilling Investigation and Phase 3 Coal Mining Risk Assessment 30 September 2019*
- *Integral Geotechnique: Coed D'Arcy – Proof Drilling of Plots 31November 2019*
- *Integral Geotechnique: Phase 2 Heritage Park, Coed D'Arcy – Planning Condition 11. Planning Application P2019/0021 13 December 2019*
- *BP Area 1 Remediation. Validation Report. 44382729/BRRP0004. URS 18 January 2010*

These documents are appended herein, but not to each of the finished surface validation reports.

## 2.4 Brief Background and Nature of the Proposed Verification

As part of the regeneration of the former BP Llandarcy oil refinery site, URS were commissioned by BP to develop a remediation strategy and validation for the site known as Area 1 (the site). The site location is shown in Figure 1.

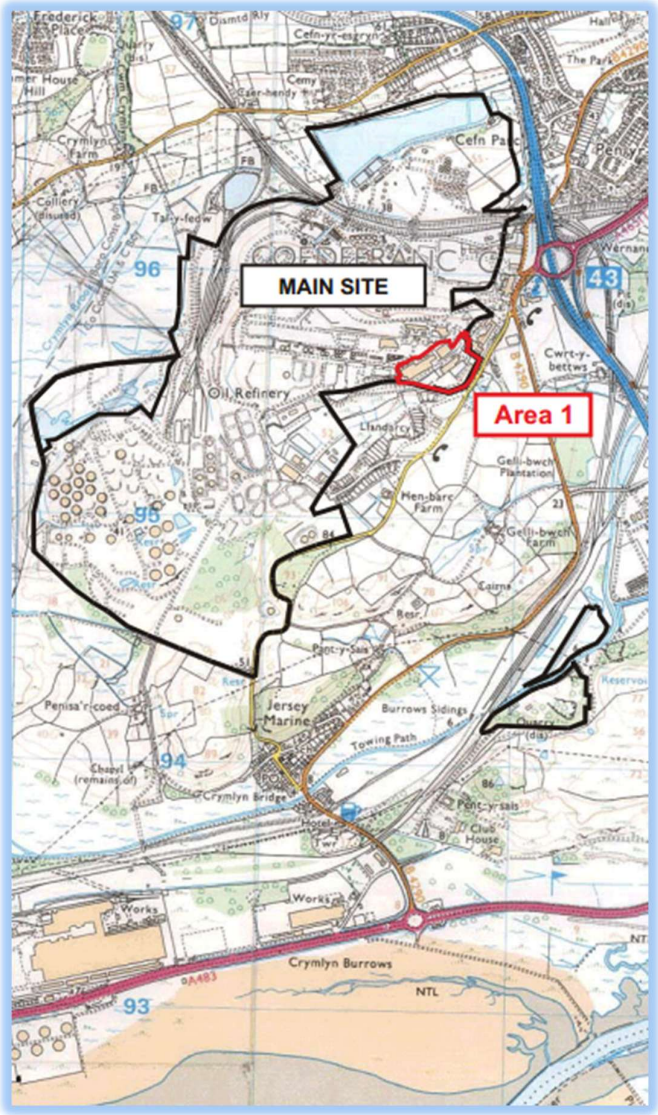



***Figure 1: Area 1 Location***

Following regulatory acceptance of the remediation strategy, the remediation of Area 1 was undertaken between 5 February 2007 and 29 June 2009. URS thence validated the remediated site, and proposed measures need for future validation of the site, once end use had been developed. These requirements are fully described in the appended URS Validation Report.

The main approved points for Area 1 were;

a) Soils Validated to the agreed remedial criteria in the area excluding the Lower Car Park,
b) In-situ validation of the soils prior to the final profiling (this report)
c) Final validation of of soils within garden areas,
d) Incorporation of passive venting and gas membranes beneath properties (not included in these reports, but verified by others.)

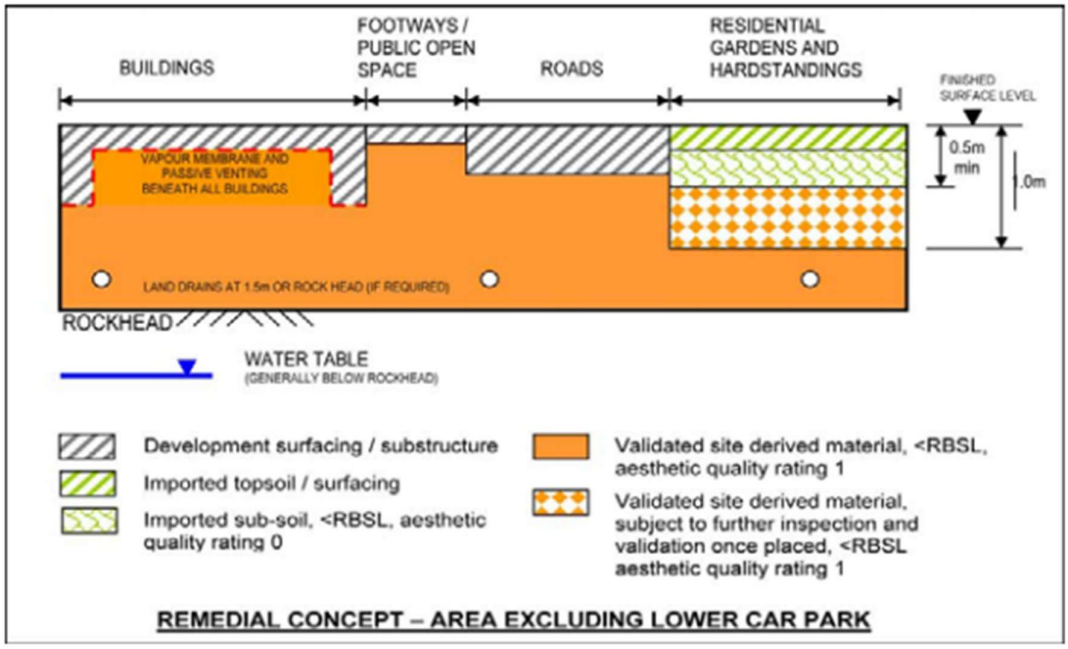
Thus, SGS propose the following:

i) Attend site to verify the sub-grade, to ensure compliance with the URS validation limits,
ii) Attend site once imported materials comprising the upper 500mm of imported topsoils and sub-soils have been placed, to inspect the thickness and compliance with the URS validation limits and to ensure the “no-dig” layer has been incorporated.

## 3.0 SOIL TESTING

### 3.1 Introduction

Testing of soils in accordance with the enclosed URS validation suite was undertaken at each of Area 1 Plots 25 to 57, to determine the soil chemistry values of the upper surface of the remediated site soils, which had been verified by URS and signed off by NPT. The materials tested in this phase, correspond with the following URS diagram, being the "Validated site derived material, subject to further inspection and validation once placed", as approved by NPT in the URS validation report.




This testing was undertaken across the whole site, prior to the import of the final "inert" materials making up the 500mm garden areas of each plot. Testing was undertaken at a UKAS accredited laboratory. The results are appended to this report, together with an assessment of those values related to the approved URS validation suite.

| Parameter | All remaining soils, excavated surplus soils and imported material [1] (mg/kg) Residential | Excavated treated granular material (mg/kg) |
|---|---|---|
| Asbestos (sum of all types) | 200 | 200 |
| Arsenic[2] | 64 | The quality of the material was not be affected by its treatment, other than as regards the asbestos content. Testing of this material for parameters other than asbestos had previously been undertaken. |
| Cadmium | 3.6 | |
| Chromium | 130 | |
| Mercury[2] | 1 | |
| Nickel[2] | 50 | |
| Selenium | 3 | |
| Lead[2] | 337 | |
| Vanadium | 416 | |
| Copper[2] | 478 | |
| Zinc[3] | 3280 | |
| Benzene | 0.12 | |
| Ethylbenzene | 37 | |
| Toluene | 36 | |
| Xylene | 32 | |
| Benzo(a)pyrene[2,4] | 0.9 | |
| 1,2-Dichloroethane | 0.04 | |
| Dichloromethane | 5 | |
| Tetrachloroethene | 11 | |
| Trichloroethene | 1 | |
| Vinyl Chloride | 0.01 | |

| Parameter | All remaining soils, excavated surplus soils and imported material [1] (mg/kg) Residential | Excavated treated granular material (mg/kg) |
|---|---|---|
| 1,2-Dichloroethene | 4 | |
| 1,1,1-Trichloroethane | 154 | |
| TPH | 1,717 | |

***Table 3: URS Soil Validation Limits***

Site testing was undertaken on 07 October 2025, and comprised hand dug trial pits to 600mm, or rockhead. All locations noted Made Ground, with no hydrocarbon odours. At Plots 25 and 26, rock head was noted at between 500mm to 600mm depth.

General photographs of the landscaped areas are appended.

## 4.0 CONCLUSIONS

All test results were in accordance with and did not exceed the limits set out by URS within Table 3 3.

The plots will subsequently be required to have a total of 500mm of this compliant material, including 100mm of topsoil, with a “no dig” separation barrier at the base of the 500mm.

Verification of this soil structure will need to be undertaken at a minimum of 1 in 4 plots, to ensure depth and chemical compliance. SGS have undertaken testing at a higher frequency.

# APPENDIX A

## Drawings

Site Boundary




This line should measure 10mm when printed correctly

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| Rev | Date | By | Chk | Description |
|---|---|---|---|---|
| C01 | 15.05.2025 | AP | AJP | First Issue |
| C02 | 26.05.2025 | AP | AJP | Key ledged added, PV and ASHP added to all plots, Sheds and bin stores added in line with Pod spec. |

Key Ledged

- Electric Meter Box
- EV Charging
- BT
- SVP
- RWP
- ASHP
- PV Panel
- Tool/Bike Store
- Bin Store
- Rotary Clothes Line
- BATTERY

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**Project Name**
Residential Development
Coed Darcy Phase 2 (Pobl)

**Client Name**
TRJ

**Drawing Title**
Site Plan

| Scale | Project No. |
|---|---|
| 1/100 @ A1 | 9856 |

| Status | Purpose Of Issue |
|---|---|
| C1 | Issued for Construction |

Project • Org • Vol • Form • Info
11341 • RL • ZZ • 00 • DR • A

| Number | Revision |
|---|---|
| 0920 | C02 |

# APPENDIX B

## Soil Validation

Soil Test Results

Comparison with URS Validation Limits

General Site Photographs

envirolab
Hattersley Science & Technology Park
Stockport Road, Hattersley, SK14 3QU

# FINAL ANALYTICAL TEST REPORT

**Envirolab Job Number:** 25/11651
**Issue Number:** 1 **Date:** 22 October, 2025

**Client:**
Spectrum Geo Services
Foxglove Cottage
Cwm Risca Lane
Tondu
Wales
CF32 0EH

**Project Manager:** Rob Griffiths
**Project Name:** Coed Darcy
**Project Ref:** 25061
**Order No:** 25061/01
**Date Samples Received:** 14/10/25
**Date Instructions Received:** 14/10/25
**Date Analysis Completed:** 22/10/25

**Approved by:**



Gemma Berrisford
Deputy Client Services Supervisor

mCERTS THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME
UKAS TESTING 1247

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/1 | 25/11651/2 | 25/11651/3 | 25/11651/4 | 25/11651/5 | 25/11651/6 | 25/11651/7 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| Depth To Bottom | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 4A | 4A | 4A | 4A | 5AE | 4AE | 4A | | | |
| % Stones >10mm$_A$ | 22.0 | 27.6 | 10.5 | 20.2 | 21.0 | 23.4 | 10.0 | % w/w | 0.1 | A-T-044 |
| Arsenic$_D^{M\#}$ | 5 | 7 | 8 | 10 | 6 | 5 | 5 | mg/kg | 1 | A-T-024s |
| Cadmium$_D$ | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | mg/kg | 1 | A-T-024s |
| Copper$_D^{M\#}$ | 17 | 23 | 28 | 26 | 17 | 18 | 15 | mg/kg | 1 | A-T-024s |
| Chromium$_D^{M\#}$ | 10 | 12 | 15 | 10 | 10 | 22 | 13 | mg/kg | 1 | A-T-024s |
| Lead$_D^{M\#}$ | 23 | 35 | 36 | 37 | 24 | 40 | 21 | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | mg/kg | 0.17 | A-T-024s |
| Nickel$_D^{M\#}$ | 23 | 14 | 25 | 14 | 13 | 14 | 15 | mg/kg | 1 | A-T-024s |
| Selenium$_D^{M\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-024s |
| Vanadium$_D^{M\#}$ | 10 | 15 | 16 | 12 | 13 | 18 | 13 | mg/kg | 1 | A-T-024s |
| Zinc$_D^{M\#}$ | 74 | 84 | 118 | 93 | 87 | 152 | 99 | mg/kg | 1 | A-T-024s |
| Benzo(a)pyrene$_A^{M\#}$ | 0.21 | 0.16 | 0.35 | 0.20 | 0.10 | 0.24 | 0.20 | mg/kg | 0.04 | A-T-019s |
| Vinyl Chloride (Chloroethene)$_A^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| Dichloromethane$_A$ | <5 | <5 | <5 | <5 | <5 | <5 | <5 | µg/kg | 5 | A-T-006s |
| cis 1,2-Dichloroethene$_A^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| 1,1,1-Trichloroethane$_A^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| 1,2-Dichloroethane$_A^{\#}$ | <2 | <2 | <2 | <2 | <2 | <2 | <2 | µg/kg | 2 | A-T-006s |
| Trichloroethene$_A^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| Tetrachloroethene$_A^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |

Envirolab Job Number: 25/11651

Client Project Name: Coed Darcy

Client Project Ref: 25061

| Lab Sample ID | 25/11651/1 | 25/11651/2 | 25/11651/3 | 25/11651/4 | 25/11651/5 | 25/11651/6 | 25/11651/7 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| Depth To Bottom | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 4A | 4A | 4A | 4A | 5AE | 4AE | 4A | | | |
| Asbestos in Soil (inc. matrix) ^ | | | | | | | | | | |
| Asbestos in soil$_D^{\#}$ | NAD | NAD | NAD | NAD | NAD | NAD | NAD | | | A-T-045 |
| Asbestos Matrix (visual)$_D$ | - | - | - | - | - | - | - | | | A-T-045 |
| Asbestos Matrix (microscope)$_D$ | - | - | - | - | - | - | - | | | A-T-045 |
| Asbestos ACM - Suitable for Water Absorption Test?$_D$ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | | A-T-045 |

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/1 | 25/11651/2 | 25/11651/3 | 25/11651/4 | 25/11651/5 | 25/11651/6 | 25/11651/7 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| Depth To Bottom | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 4A | 4A | 4A | 4A | 5AE | 4AE | 4A | | | |
| **TPH CWG with Clean Up** | | | | | | | | | | |
| Ali >C5-C6$_A$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Ali >C6-C8$_A$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Ali >C8-C10$_A$ | <1 | <1 | <1 | <1 | <5 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C10-C12$_A^{M\#}$ | <1 | <1 | <1 | 4 | <5 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C12-C16$_A^{M\#}$ | <1 | <1 | <1 | 10 | <5 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C16-C21$_A^{M\#}$ | <1 | <1 | <1 | <1 | 8 | <1 | 2 | mg/kg | 1 | A-T-055s |
| Ali >C21-C35$_A^{M\#}$ | 3 | 2 | 12 | 5 | 45 | 12 | 22 | mg/kg | 1 | A-T-055s |
| Total Aliphatics$_A$ | 3 | 2 | 13 | 20 | 56 | 13 | 24 | mg/kg | 1 | Calc-As Recd |
| Aro >C5-C7$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Aro >C7-C8$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Aro >C8-C10$_A$ | <1 | <1 | <1 | <1 | <5 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C10-C12$_A$ | <1 | <1 | <1 | <1 | <5 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C12-C16$_A$ | <1 | <1 | <1 | 3 | 27 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C16-C21$_A^{M\#}$ | <1 | <1 | 3 | 2 | 199 | 2 | 5 | mg/kg | 1 | A-T-055s |
| Aro >C21-C35$_A^{M\#}$ | 4 | 5 | 15 | 8 | 390 | 11 | 30 | mg/kg | 1 | A-T-055s |
| Total Aromatics$_A$ | 5 | 6 | 19 | 13 | 615 | 14 | 37 | mg/kg | 1 | Calc-As Recd |
| TPH (Ali & Aro >C5-C35)$_A$ | 8 | 8 | 32 | 34 | 672 | 27 | 61 | mg/kg | 1 | Calc-As Recd |
| BTEX - Benzene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - Toluene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - Ethyl Benzene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - m & p Xylene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - o Xylene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| MTBE$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/8 | 25/11651/9 | 25/11651/10 | 25/11651/11 | 25/11651/12 | 25/11651/13 | 25/11651/14 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 32 | 33 | 34 | 35 | 36 | 37 | 38 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| Depth To Bottom | 0.50 | 0.50 | 0.50 | 0.60 | 0.50 | 0.50 | 0.50 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 4A | 4AB | 4ABE | 4A | 4A | 4A | 4A | | | |
| % Stones >10mm$_A$ | 23.0 | 18.3 | <0.1 | 10.5 | 36.4 | 14.5 | 8.6 | % w/w | 0.1 | A-T-044 |
| Arsenic$_D$$^{M\#}$ | 6 | 5 | 9 | 5 | 5 | 8 | 4 | mg/kg | 1 | A-T-024s |
| Cadmium$_D$ | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | mg/kg | 1 | A-T-024s |
| Copper$_D$$^{M\#}$ | 28 | 20 | 25 | 22 | 17 | 89 | 16 | mg/kg | 1 | A-T-024s |
| Chromium$_D$$^{M\#}$ | 25 | 12 | 15 | 13 | 9 | 11 | 12 | mg/kg | 1 | A-T-024s |
| Lead$_D$$^{M\#}$ | 18 | 20 | 24 | 20 | 17 | 16 | 13 | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | mg/kg | 0.17 | A-T-024s |
| Nickel$_D$$^{M\#}$ | 20 | 18 | 25 | 26 | 17 | 16 | 18 | mg/kg | 1 | A-T-024s |
| Selenium$_D$$^{M\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-024s |
| Vanadium$_D$$^{M\#}$ | 22 | 14 | 15 | 13 | 10 | 12 | 13 | mg/kg | 1 | A-T-024s |
| Zinc$_D$$^{M\#}$ | 63 | 70 | 96 | 74 | 64 | 76 | 49 | mg/kg | 1 | A-T-024s |
| Benzo(a)pyrene$_A$$^{M\#}$ | 0.11 | 0.12 | 0.20 | 0.08 | 0.10 | <0.04 | <0.04 | mg/kg | 0.04 | A-T-019s |
| Vinyl Chloride (Chloroethene)$_A$$^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| Dichloromethane$_A$ | <5 | <5 | <5 | <5 | <5 | <5 | <5 | µg/kg | 5 | A-T-006s |
| cis 1,2-Dichloroethene$_A$$^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| 1,1,1-Trichloroethane$_A$$^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| 1,2-Dichloroethane$_A$$^{\#}$ | <2 | <2 | <2 | <2 | <2 | <2 | <2 | µg/kg | 2 | A-T-006s |
| Trichloroethene$_A$$^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| Tetrachloroethene$_A$$^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |

Envirolab Job Number: 25/11651

Client Project Name: Coed Darcy

Client Project Ref: 25061

| Lab Sample ID | 25/11651/8 | 25/11651/9 | 25/11651/10 | 25/11651/11 | 25/11651/12 | 25/11651/13 | 25/11651/14 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 32 | 33 | 34 | 35 | 36 | 37 | 38 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| Depth To Bottom | 0.50 | 0.50 | 0.50 | 0.60 | 0.50 | 0.50 | 0.50 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 4A | 4AB | 4ABE | 4A | 4A | 4A | 4A | | | |
| Asbestos in Soil (inc. matrix) ^ | | | | | | | | | | |
| Asbestos in soil$_D^{\#}$ | NAD | NAD | NAD | NAD | NAD | NAD | NAD | | | A-T-045 |
| Asbestos Matrix (visual)$_D$ | - | - | - | - | - | - | - | | | A-T-045 |
| Asbestos Matrix (microscope)$_D$ | - | - | - | - | - | - | - | | | A-T-045 |
| Asbestos ACM - Suitable for Water Absorption Test?$_D$ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | | A-T-045 |

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/8 | 25/11651/9 | 25/11651/10 | 25/11651/11 | 25/11651/12 | 25/11651/13 | 25/11651/14 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 32 | 33 | 34 | 35 | 36 | 37 | 38 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| Depth To Bottom | 0.50 | 0.50 | 0.50 | 0.60 | 0.50 | 0.50 | 0.50 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 4A | 4AB | 4ABE | 4A | 4A | 4A | 4A | | | |
| **TPH CWG with Clean Up** | | | | | | | | | | |
| Ali >C5-C6$_A$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Ali >C6-C8$_A$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Ali >C8-C10$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C10-C12$_A^{M\#}$ | <1 | <1 | <1 | <1 | <1 | 21 | 18 | mg/kg | 1 | A-T-055s |
| Ali >C12-C16$_A^{M\#}$ | <1 | <1 | <1 | <1 | <1 | 61 | 71 | mg/kg | 1 | A-T-055s |
| Ali >C16-C21$_A^{M\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | 2 | mg/kg | 1 | A-T-055s |
| Ali >C21-C35$_A^{M\#}$ | 12 | 8 | 13 | 2 | 2 | <1 | 6 | mg/kg | 1 | A-T-055s |
| Total Aliphatics$_A$ | 13 | 9 | 13 | 2 | 2 | 84 | 98 | mg/kg | 1 | Calc-As Recd |
| Aro >C5-C7$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Aro >C7-C8$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Aro >C8-C10$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C10-C12$_A$ | <1 | <1 | <1 | <1 | <1 | 2 | 2 | mg/kg | 1 | A-T-055s |
| Aro >C12-C16$_A$ | 2 | <1 | 1 | <1 | <1 | 9 | 9 | mg/kg | 1 | A-T-055s |
| Aro >C16-C21$_A^{M\#}$ | 3 | 2 | 2 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C21-C35$_A^{M\#}$ | 14 | 7 | 10 | 2 | 3 | <1 | 4 | mg/kg | 1 | A-T-055s |
| Total Aromatics$_A$ | 19 | 10 | 13 | 2 | 4 | 11 | 16 | mg/kg | 1 | Calc-As Recd |
| TPH (Ali & Aro >C5-C35)$_A$ | 32 | 18 | 26 | 4 | 6 | 96 | 114 | mg/kg | 1 | Calc-As Recd |
| BTEX - Benzene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - Toluene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - Ethyl Benzene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - m & p Xylene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - o Xylene$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| MTBE$_A^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/15 | 25/11651/16 | 25/11651/17 | 25/11651/18 | 25/11651/19 | 25/11651/20 | 25/11651/21 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 39 | 40 | 46 | 47 | 48 | 49 | 49 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | | | |
| Depth To Bottom | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.40 | 0.30 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 6A | 6A | 6A | 6A | 6A | 6AE | 6A | | | |
| % Stones >10mm$_A$ | <0.1 | <0.1 | 18.0 | 9.5 | 29.4 | 20.0 | <0.1 | % w/w | 0.1 | A-T-044 |
| Arsenic$_D^{M\#}$ | 12 | 10 | 8 | 11 | 6 | 7 | 8 | mg/kg | 1 | A-T-024s |
| Cadmium$_D$ | <1.0 | <1.0 | <2.0 | <1.0 | <1.0 | <1.0 | <2.0 | mg/kg | 1 | A-T-024s |
| Copper$_D^{M\#}$ | 38 | 33 | 18 | 39 | 18 | 21 | 14 | mg/kg | 1 | A-T-024s |
| Chromium$_D^{M\#}$ | 15 | 15 | 14 | 12 | 10 | 12 | 16 | mg/kg | 1 | A-T-024s |
| Lead$_D^{M\#}$ | 54 | 48 | 33 | 38 | 22 | 26 | 28 | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | <0.17 | <0.17 | <0.34 | <0.17 | <0.17 | <0.17 | <0.34 | mg/kg | 0.17 | A-T-024s |
| Nickel$_D^{M\#}$ | 15 | 18 | 19 | 21 | 15 | 15 | 19 | mg/kg | 1 | A-T-024s |
| Selenium$_D^{M\#}$ | 2 | <1 | <2 | <1 | <1 | <1 | <2 | mg/kg | 1 | A-T-024s |
| Vanadium$_D^{M\#}$ | 17 | 16 | 18 | 14 | 11 | 15 | 23 | mg/kg | 1 | A-T-024s |
| Zinc$_D^{M\#}$ | 112 | 118 | 101 | 108 | 76 | 86 | 91 | mg/kg | 1 | A-T-024s |
| Benzo(a)pyrene$_A^{M\#}$ | <0.04 | 0.06 | 0.15 | 0.07 | 0.10 | 0.23 | <0.04 | mg/kg | 0.04 | A-T-019s |
| Vinyl Chloride (Chloroethene)$_A^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| Dichloromethane$_A$ | <5 | <5 | <5 | <5 | <5 | <5 | <5 | µg/kg | 5 | A-T-006s |
| cis 1,2-Dichloroethene$_A^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| 1,1,1-Trichloroethane$_A^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| 1,2-Dichloroethane$_A^{\#}$ | <2 | <2 | <2 | <2 | <2 | <2 | <2 | µg/kg | 2 | A-T-006s |
| Trichloroethene$_A^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| Tetrachloroethene$_A^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |

Envirolab Job Number: 25/11651

Client Project Name: Coed Darcy

Client Project Ref: 25061

| Lab Sample ID | 25/11651/15 | 25/11651/16 | 25/11651/17 | 25/11651/18 | 25/11651/19 | 25/11651/20 | 25/11651/21 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 39 | 40 | 46 | 47 | 48 | 49 | 49 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | | | |
| Depth To Bottom | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.40 | 0.30 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 6A | 6A | 6A | 6A | 6A | 6AE | 6A | | | |
| Asbestos in Soil (inc. matrix) ^ | | | | | | | | | | |
| Asbestos in soil$_{D}^{\#}$ | NAD | NAD | NAD | NAD | NAD | NAD | NAD | | | A-T-045 |
| Asbestos Matrix (visual)$_{D}$ | - | - | - | - | - | - | - | | | A-T-045 |
| Asbestos Matrix (microscope)$_{D}$ | - | - | - | - | - | - | - | | | A-T-045 |
| Asbestos ACM - Suitable for Water Absorption Test?$_{D}$ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | | A-T-045 |

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/15 | 25/11651/16 | 25/11651/17 | 25/11651/18 | 25/11651/19 | 25/11651/20 | 25/11651/21 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 39 | 40 | 46 | 47 | 48 | 49 | 49 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | | | |
| Depth To Bottom | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.40 | 0.30 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 6A | 6A | 6A | 6A | 6A | 6AE | 6A | | | |
| **TPH CWG with Clean Up** | | | | | | | | | | |
| Ali >C5-C6$_A$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Ali >C6-C8$_A$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Ali >C8-C10$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C10-C12$_A$$^{M\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C12-C16$_A$$^{M\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C16-C21$_A$$^{M\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C21-C35$_A$$^{M\#}$ | 5 | 4 | 2 | 2 | 3 | 6 | 1 | mg/kg | 1 | A-T-055s |
| Total Aliphatics$_A$ | 5 | 4 | 2 | 2 | 3 | 7 | 1 | mg/kg | 1 | Calc-As Recd |
| Aro >C5-C7$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Aro >C7-C8$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Aro >C8-C10$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C10-C12$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C12-C16$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C16-C21$_A$$^{M\#}$ | <1 | 1 | <1 | <1 | <1 | 2 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C21-C35$_A$$^{M\#}$ | 3 | 3 | 2 | 2 | 5 | 6 | <1 | mg/kg | 1 | A-T-055s |
| Total Aromatics$_A$ | 3 | 4 | 2 | 2 | 5 | 7 | <1 | mg/kg | 1 | Calc-As Recd |
| TPH (Ali & Aro >C5-C35)$_A$ | 8 | 9 | 4 | 4 | 8 | 15 | 1 | mg/kg | 1 | Calc-As Recd |
| BTEX - Benzene$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - Toluene$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - Ethyl Benzene$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - m & p Xylene$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - o Xylene$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| MTBE$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/22 | 25/11651/23 | 25/11651/24 | 25/11651/25 | 25/11651/26 | 25/11651/27 | 25/11651/28 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 50 | 51 | 51 | 52 | 53 | 55 | 56 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| Depth To Bottom | 0.50 | 0.30 | 0.50 | 0.50 | 0.50 | 0.50 | 0.60 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 6AE | 6AE | 6AE | 6AE | 5AE | 4A | 5A | | | |
| % Stones >10mm$_A$ | <0.1 | <0.1 | 7.5 | 16.6 | 14.9 | 16.5 | 25.6 | % w/w | 0.1 | A-T-044 |
| Arsenic$_D$$^{M\#}$ | 9 | 9 | 6 | 8 | 10 | 8 | 6 | mg/kg | 1 | A-T-024s |
| Cadmium$_D$ | <2.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | mg/kg | 1 | A-T-024s |
| Copper$_D$$^{M\#}$ | 18 | 38 | 25 | 39 | 33 | 28 | 17 | mg/kg | 1 | A-T-024s |
| Chromium$_D$$^{M\#}$ | 16 | 17 | 13 | 11 | 11 | 15 | 10 | mg/kg | 1 | A-T-024s |
| Lead$_D$$^{M\#}$ | 32 | 37 | 27 | 50 | 65 | 44 | 21 | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | <0.34 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | mg/kg | 0.17 | A-T-024s |
| Nickel$_D$$^{M\#}$ | 20 | 21 | 20 | 22 | 22 | 14 | 12 | mg/kg | 1 | A-T-024s |
| Selenium$_D$$^{M\#}$ | <2 | 1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-024s |
| Vanadium$_D$$^{M\#}$ | 22 | 17 | 15 | 11 | 12 | 18 | 11 | mg/kg | 1 | A-T-024s |
| Zinc$_D$$^{M\#}$ | 95 | 120 | 86 | 164 | 162 | 205 | 61 | mg/kg | 1 | A-T-024s |
| Benzo(a)pyrene$_A$$^{M\#}$ | 0.06 | 0.15 | 0.06 | 0.25 | 0.09 | 0.49 | 0.12 | mg/kg | 0.04 | A-T-019s |
| Vinyl Chloride (Chloroethene)$_A$$^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| Dichloromethane$_A$ | <5 | <5 | <5 | <5 | <5 | <5 | <5 | µg/kg | 5 | A-T-006s |
| cis 1,2-Dichloroethene$_A$$^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| 1,1,1-Trichloroethane$_A$$^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| 1,2-Dichloroethane$_A$$^{\#}$ | <2 | <2 | <2 | <2 | <2 | <2 | <2 | µg/kg | 2 | A-T-006s |
| Trichloroethene$_A$$^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |
| Tetrachloroethene$_A$$^{\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | µg/kg | 1 | A-T-006s |

Envirolab Job Number: 25/11651

Client Project Name: Coed Darcy

Client Project Ref: 25061

| Lab Sample ID | 25/11651/22 | 25/11651/23 | 25/11651/24 | 25/11651/25 | 25/11651/26 | 25/11651/27 | 25/11651/28 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 50 | 51 | 51 | 52 | 53 | 55 | 56 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| Depth To Bottom | 0.50 | 0.30 | 0.50 | 0.50 | 0.50 | 0.50 | 0.60 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 6AE | 6AE | 6AE | 6AE | 5AE | 4A | 5A | | | |
| Asbestos in Soil (inc. matrix) ^ | | | | | | | | | | |
| Asbestos in soil$_{D}^{\#}$ | NAD | NAD | NAD | NAD | NAD | NAD | NAD | | | A-T-045 |
| Asbestos Matrix (visual)$_{D}$ | - | - | - | - | - | - | - | | | A-T-045 |
| Asbestos Matrix (microscope)$_{D}$ | - | - | - | - | - | - | - | | | A-T-045 |
| Asbestos ACM - Suitable for Water Absorption Test?$_{D}$ | N/A | N/A | N/A | N/A | N/A | N/A | N/A | | | A-T-045 |

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/22 | 25/11651/23 | 25/11651/24 | 25/11651/25 | 25/11651/26 | 25/11651/27 | 25/11651/28 | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 50 | 51 | 51 | 52 | 53 | 55 | 56 | | | |
| Depth to Top | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | | | |
| Depth To Bottom | 0.50 | 0.30 | 0.50 | 0.50 | 0.50 | 0.50 | 0.60 | | | |
| Date Sampled | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | | | |
| Sample Type | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | SOIL - ES | | | |
| Sample Matrix Code | 6AE | 6AE | 6AE | 6AE | 5AE | 4A | 5A | | | |
| **TPH CWG with Clean Up** | | | | | | | | | | |
| Ali >C5-C6$_A$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Ali >C6-C8$_A$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Ali >C8-C10$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C10-C12$_A$$^{M\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C12-C16$_A$$^{M\#}$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C16-C21$_A$$^{M\#}$ | <1 | 1 | 1 | <1 | <1 | 3 | <1 | mg/kg | 1 | A-T-055s |
| Ali >C21-C35$_A$$^{M\#}$ | 5 | 13 | 4 | 5 | 9 | 61 | 7 | mg/kg | 1 | A-T-055s |
| Total Aliphatics$_A$ | 5 | 14 | 5 | 5 | 9 | 64 | 9 | mg/kg | 1 | Calc-As Recd |
| Aro >C5-C7$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Aro >C7-C8$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| Aro >C8-C10$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | 2 | mg/kg | 1 | A-T-055s |
| Aro >C10-C12$_A$ | <1 | <1 | <1 | <1 | <1 | <1 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C12-C16$_A$ | 4 | <1 | <1 | <1 | <1 | 3 | <1 | mg/kg | 1 | A-T-055s |
| Aro >C16-C21$_A$$^{M\#}$ | 5 | 4 | 1 | 2 | 2 | 12 | 2 | mg/kg | 1 | A-T-055s |
| Aro >C21-C35$_A$$^{M\#}$ | 5 | 15 | 3 | 6 | 10 | 68 | 6 | mg/kg | 1 | A-T-055s |
| Total Aromatics$_A$ | 13 | 19 | 4 | 8 | 12 | 83 | 9 | mg/kg | 1 | Calc-As Recd |
| TPH (Ali & Aro >C5-C35)$_A$ | 18 | 33 | 9 | 13 | 22 | 147 | 18 | mg/kg | 1 | Calc-As Recd |
| BTEX - Benzene$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - Toluene$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - Ethyl Benzene$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - m & p Xylene$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| BTEX - o Xylene$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |
| MTBE$_A$$^{\#}$ | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | mg/kg | 0.01 | A-T-022s |

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/29 | | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 57 | | | | | | | | | |
| Depth to Top | 0.00 | | | | | | | | | |
| Depth To Bottom | 0.60 | | | | | | | | | |
| Date Sampled | 09-Oct-25 | | | | | | | | | |
| Sample Type | SOLID | | | | | | | | | |
| Sample Matrix Code | 7 | | | | | | | | | |
| % Stones >10mm$_A$ | <0.1 | | | | | | | % w/w | 0.1 | A-T-044 |
| Arsenic$_D^{M\#}$ | 5$^U$ | | | | | | | mg/kg | 1 | A-T-024s |
| Cadmium$_D$ | <1.0 | | | | | | | mg/kg | 1 | A-T-024s |
| Copper$_D^{M\#}$ | 17$^U$ | | | | | | | mg/kg | 1 | A-T-024s |
| Chromium$_D^{M\#}$ | 13$^U$ | | | | | | | mg/kg | 1 | A-T-024s |
| Lead$_D^{M\#}$ | 29$^U$ | | | | | | | mg/kg | 1 | A-T-024s |
| Mercury$_D$ | <0.17 | | | | | | | mg/kg | 0.17 | A-T-024s |
| Nickel$_D^{M\#}$ | 16$^U$ | | | | | | | mg/kg | 1 | A-T-024s |
| Selenium$_D^{M\#}$ | <1$^U$ | | | | | | | mg/kg | 1 | A-T-024s |
| Vanadium$_D^{M\#}$ | 15$^U$ | | | | | | | mg/kg | 1 | A-T-024s |
| Zinc$_D^{M\#}$ | 74$^U$ | | | | | | | mg/kg | 1 | A-T-024s |
| Benzo(a)pyrene$_A^{M\#}$ | 0.39$^U$ | | | | | | | mg/kg | 0.04 | A-T-019s |
| Vinyl Chloride (Chloroethene)$_A^{\#}$ | <1$^U$ | | | | | | | µg/kg | 1 | A-T-006s |
| Dichloromethane$_A$ | <5 | | | | | | | µg/kg | 5 | A-T-006s |
| cis 1,2-Dichloroethene$_A^{\#}$ | <1$^U$ | | | | | | | µg/kg | 1 | A-T-006s |
| 1,1,1-Trichloroethane$_A^{\#}$ | <1$^U$ | | | | | | | µg/kg | 1 | A-T-006s |
| 1,2-Dichloroethane$_A^{\#}$ | <2$^U$ | | | | | | | µg/kg | 2 | A-T-006s |
| Trichloroethene$_A^{\#}$ | <1$^U$ | | | | | | | µg/kg | 1 | A-T-006s |
| Tetrachloroethene$_A^{\#}$ | <1$^U$ | | | | | | | µg/kg | 1 | A-T-006s |

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/29 | | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 57 | | | | | | | | | |
| Depth to Top | 0.00 | | | | | | | | | |
| Depth To Bottom | 0.60 | | | | | | | | | |
| Date Sampled | 09-Oct-25 | | | | | | | | | |
| Sample Type | SOLID | | | | | | | | | |
| Sample Matrix Code | 7 | | | | | | | | | |
| **Asbestos in Soil (inc. matrix) ^** | | | | | | | | | | |
| Asbestos in soil$_D^{\#}$ | NAD$^U$ | | | | | | | | | A-T-045 |
| Asbestos Matrix (visual)$_D$ | - | | | | | | | | | A-T-045 |
| Asbestos Matrix (microscope)$_D$ | - | | | | | | | | | A-T-045 |
| Asbestos ACM - Suitable for Water Absorption Test?$_D$ | N/A | | | | | | | | | A-T-045 |

**Envirolab Job Number: 25/11651**

**Client Project Name: Coed Darcy**

**Client Project Ref: 25061**

| Lab Sample ID | 25/11651/29 | | | | | | | Units | Limit of Detection | Method ref |
|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | |
| Client Sample ID | 57 | | | | | | | | | |
| Depth to Top | 0.00 | | | | | | | | | |
| Depth To Bottom | 0.60 | | | | | | | | | |
| Date Sampled | 09-Oct-25 | | | | | | | | | |
| Sample Type | SOLID | | | | | | | | | |
| Sample Matrix Code | 7 | | | | | | | | | |
| **TPH CWG with Clean Up** | | | | | | | | | | |
| Ali >C5-C6$_A$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| Ali >C6-C8$_A$ | <0.01 | | | | | | | mg/kg | 0.01 | A-T-022s |
| Ali >C8-C10$_A$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C10-C12$_A^{M\#}$ | <1$^U$ | | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C12-C16$_A^{M\#}$ | <1$^U$ | | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C16-C21$_A^{M\#}$ | 3$^U$ | | | | | | | mg/kg | 1 | A-T-055s |
| Ali >C21-C35$_A^{M\#}$ | 64$^U$ | | | | | | | mg/kg | 1 | A-T-055s |
| Total Aliphatics$_A$ | 67 | | | | | | | mg/kg | 1 | Calc-As Recd |
| Aro >C5-C7$_A^{\#}$ | <0.01$^U$ | | | | | | | mg/kg | 0.01 | A-T-022s |
| Aro >C7-C8$_A^{\#}$ | <0.01$^U$ | | | | | | | mg/kg | 0.01 | A-T-022s |
| Aro >C8-C10$_A$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C10-C12$_A$ | <1 | | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C12-C16$_A$ | 1 | | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C16-C21$_A^{M\#}$ | 6$^U$ | | | | | | | mg/kg | 1 | A-T-055s |
| Aro >C21-C35$_A^{M\#}$ | 38$^U$ | | | | | | | mg/kg | 1 | A-T-055s |
| Total Aromatics$_A$ | 46 | | | | | | | mg/kg | 1 | Calc-As Recd |
| TPH (Ali & Aro >C5-C35)$_A$ | 112 | | | | | | | mg/kg | 1 | Calc-As Recd |
| BTEX - Benzene$_A^{\#}$ | <0.01$^U$ | | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - Toluene$_A^{\#}$ | <0.01$^U$ | | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - Ethyl Benzene$_A^{\#}$ | <0.01$^U$ | | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - m & p Xylene$_A^{\#}$ | <0.01$^U$ | | | | | | | mg/kg | 0.01 | A-T-022s |
| BTEX - o Xylene$_A^{\#}$ | <0.01$^U$ | | | | | | | mg/kg | 0.01 | A-T-022s |
| MTBE$_A^{\#}$ | <0.01$^U$ | | | | | | | mg/kg | 0.01 | A-T-022s |

## Report Notes

**General**

•This report shall not be reproduced, except in full, without written approval from Envirolab.
•The client Sample No, Client Sample ID, Depth to top, Depth to Bottom and Date Sampled are all provided by the client and can affect the validity of results.
•The results reported herein relate only to the material supplied to the laboratory.
•The residue of any samples contained within this report, and any received within the same delivery, will be disposed of **four weeks** after the initial scheduling. For samples tested for Asbestos we will retain a portion of the dried sample for a minimum of **six months** after the initial Asbestos testing is completed.
•Analytical results reflect the quality of the sample at the time of analysis only.
•Opinions and Interpretations expressed are outside our scope of accreditation.
•A deviating sample report is appended and will indicate if samples or tests have been found to be deviating. Any test results affected may not be an accurate record of the concentration at the time of sampling and, as a result, may be invalid.
•If a sample is outside of the calibration range or affected by interferences then it may need diluting. This will result in the limit of detection (LOD) being raised.
•Subcontracted Analysis: Please see the appended report for any deviations, current LODs and accreditation status of the test.

**Key**

| | |
|---|---|
| Superscript "#" | Accredited to ISO 17025 |
| Superscript "M" | Accredited to MCertS |
| Superscript "U" | Individual result not accredited |
| None of the above symbols | Analysis unaccredited |
| Subscript "A" | Analysis performed on as-received Sample |
| Subscript "D" | Analysis performed on the dried sample, crushed to pass 2mm sieve. |
| Subscript "D" on Asbestos | Analysis performed on a dried aliquot of sample provided. |
| Subscript "^" | Analysis has dependant options against results. Details appear in the comments of your Sample receipt |
| IS | Insufficient Sample for analysis |
| US | Unsuitable Sample for analysis |
| NDP | No Determination Possible |
| NAD | No Asbestos Detected |
| Trace | Asbestos found not suitable for Gravimetric Quantification – not enough to accurately weigh. |
| N/A | Not applicable |

**Asbestos**

**Identification:** Asbestos in soil analysis is performed on a dried aliquot of the submitted sample and cannot guarantee to identify asbestos if only present in small numbers as discrete fibres/fragments in the original sample.
Stones etc. are not removed from the sample prior to analysis
"Trace Asbestos Identified" will be reported if there is not enough present to verify the type.

**Assigned Matrix Codes**

| | | | | | |
|---|---|---|---|---|---|
| 1 | SAND | 6 | CLAY/LOAM | A | Contains Stones |
| 2 | LOAM | 7 | OTHER | B | Contains Construction Rubble |
| 3 | CLAY | 8 | Asbestos Bulk (Only Asbestos ID accredited) | C | Contains visible hydrocarbons |
| 4 | LOAM/SAND | 9 | Incinerator Ash (some Metals accredited) | D | Contains glass / metal |
| 5 | SAND/CLAY | | | E | Contains roots / twigs |
| **Note: 7,8,9 matrices are not covered by our ISO 17025 or MCertS accreditation, unless stated above.** | | | | | |

**Soil Chemical Analysis:**
All results are reported as dry weight (<40°C).
For samples with Matrix Codes 1 - 6 natural stones, brick and concrete fragments >10mm and any extraneous material (visible glass, metal or twigs) are removed and excluded from the sample prior to analysis and reported results corrected to a whole sample basis. This is reported as '% stones >10mm'.
For samples with Matrix Code 7 the whole sample is dried and crushed prior to analysis and this supersedes any "A" subscripts
All analysis is performed on the sample as received for soil samples which are positive for asbestos or the client has informed asbestos may be present and/or if they are from outside the European Union and this supersedes any "D" subscripts.

**TPH by method A-T-007:**
For waters, free and visible oils are excluded from the sample used for analysis, so the reported result represents the dissolved phase only.
Results "with Clean up" indicates samples cleaned up with Silica during extraction.

**EPH CWG (method A-T-055) from TPH CWG:**
EPH CWG results have humics mathematically subtracted through instrument calculation.
Where these humic substances have been identified in any IDs from "TPH CWG with clean up" please note that the concentration is **NOT** included in the quantified results but present in the ID for information.

**Electrical Conductivity of water by method A-T-037:**
Results greater than 12900µS/cm @ $25^0$C / 11550µS/cm @ $20^0$C fall outside the calibration range and as such are unaccredited.

Please contact your client manager if you require any further information.

# Envirolab Deviating Samples Report

Hattersley Science & Technology Park, Stockport Road, Hattersley, SK14 3QU
Tel. 0161 368 4921 email. ask@envlab.co.uk

**Client:** Spectrum Geo Services, Foxglove Cottage, Cwm Risca Lane, Tondu, Wales, CF32 0EH

**Project:** Coed Darcy

**Clients Project No:** 25061

**Project No:** 25/11651

**Date Received:** 14/10/2025 (am)

**Cool Box Temperatures (°C):** 12.4, 12.2, 11.9

NO DEVIATIONS IDENTIFIED

If, at any point before reaching the laboratory, the temperature of the samples has breached those set in published standards, e.g. BS-EN 5667-3, ISO 18400-102:2017, then the concentration of any affected analytes may differ from that at the time of sampling.

# Envirolab Analysis Dates

| Lab Sample ID | 25/11651/1 | 25/11651/2 | 25/11651/3 | 25/11651/4 | 25/11651/5 | 25/11651/6 | 25/11651/7 | 25/11651/8 | 25/11651/9 | 25/11651/10 | 25/11651/11 | 25/11651/12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | | | |
| Client Sample ID/Depth | 25<br>0.00-0.50m | 26<br>0.00-0.50m | 27<br>0.00-0.50m | 28<br>0.00-0.50m | 29<br>0.00-0.50m | 30<br>0.00-0.50m | 31<br>0.00-0.50m | 32<br>0.00-0.50m | 33<br>0.00-0.50m | 34<br>0.00-0.50m | 35<br>0.00-0.60m | 36<br>0.00-0.50m |
| Date Sampled | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 |
| A-T-006s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-019s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-022s | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 22/10/2025 | 22/10/2025 | 22/10/2025 | 22/10/2025 | 22/10/2025 | 22/10/2025 | 22/10/2025 | 21/10/2025 |
| A-T-024s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-044 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-045 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 |
| A-T-055s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 21/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| Calc-As Recd | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 22/10/2025 | 22/10/2025 | 22/10/2025 | 22/10/2025 | 22/10/2025 | 22/10/2025 | 22/10/2025 | 21/10/2025 |

| Lab Sample ID | 25/11651/13 | 25/11651/14 | 25/11651/15 | 25/11651/16 | 25/11651/17 | 25/11651/18 | 25/11651/19 | 25/11651/20 | 25/11651/21 | 25/11651/22 | 25/11651/23 | 25/11651/24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Client Sample No | | | | | | | | | | | | |
| Client Sample ID/Depth | 37<br>0.00-0.50m | 38<br>0.00-0.50m | 39<br>0.00-0.50m | 40<br>0.00-0.50m | 46<br>0.00-0.50m | 47<br>0.00-0.50m | 48<br>0.00-0.50m | 49<br>0.00-0.40m | 49<br>0.30-0.30m | 50<br>0.00-0.50m | 51<br>0.00-0.30m | 51<br>0.00-0.50m |
| Date Sampled | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 |
| A-T-006s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-019s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-022s | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-024s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-044 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-045 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 |
| A-T-055s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 |
| Calc-As Recd | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 |

| Lab Sample ID | 25/11651/25 | 25/11651/26 | 25/11651/27 | 25/11651/28 | 25/11651/29 |
|---|---|---|---|---|---|
| Client Sample No | | | | | |
| Client Sample ID/Depth | 52<br>0.00-0.50m | 53<br>0.00-0.50m | 55<br>0.00-0.50m | 56<br>0.00-0.60m | 57<br>0.00-0.60m |
| Date Sampled | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 | 09/10/25 |
| A-T-006s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-019s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-022s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-024s | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-044 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 | 20/10/2025 |
| A-T-045 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 | 16/10/2025 |
| A-T-055s | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 | 21/10/2025 |
| Calc-As Recd | 21/10/2025 | 21/10/2025 | 21/10/2025 | 20/10/2025 | 21/10/2025 |

The above dates are the analysis completion dates, please note that these are not necessarily the date that the analysis was weighed/extracted.

**End of Report**

**Client:** Spectrum Geo Services
**Client Project Name:** Coed Darcy
**Client Project Ref:** 25061

| Lab Sample ID | Units | Limit of Detection | Method | URS Agreed Limits | 25/11651/1 | 25/11651/2 | 25/11651/3 | 25/11651/4 | 25/11651/5 | 25/11651/6 | 25/11651/7 | 25/11651/8 | 25/11651/9 | 25/11651/10 | 25/11651/11 | 25/11651/12 | 25/11651/13 | 25/11651/14 | 25/11651/15 | 25/11651/16 | 25/11651/17 | 25/11651/18 | 25/11651/19 | 25/11651/20 | 25/11651/21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Client Sample No** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **Client Sample ID** | | | | | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 46 | 47 | 48 | 49 | 49 |
| **Depth to Top** | | | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 |
| **Depth to Bottom** | | | | | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.60 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.50 | 0.40 | 0.30 |
| **Date Sampled** | | | | | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 |
| **Sample Type** | | | | | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES |
| **Sample Matrix Code** | | | | | 4A | 4A | 4A | 4A | 5AE | 4AE | 4A | 4A | 4AB | 4ABE | 4A | 4A | 4A | 4A | 6A | 6A | 6A | 6A | 6A | 6AE | 6A |
| % Stones >10mm | % w/w | 0.1 | A-T-044 | | 22 | 27.6 | 10.5 | 20.2 | 21 | 23.4 | 10 | 23 | 18.3 | <0.1 | 10.5 | 36.4 | 14.5 | 8.6 | <0.1 | <0.1 | 18 | 9.5 | 29.4 | 20 | <0.1 |
| Arsenic | mg/kg | 1 | A-T-024s | 64 | 5 | 7 | 8 | 10 | 6 | 5 | 5 | 6 | 5 | 9 | 5 | 5 | 8 | 4 | 12 | 10 | 8 | 11 | 6 | 7 | 8 |
| Cadmium | mg/kg | 1 | A-T-024s | 3.6 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <2.0 | <1.0 | <1.0 | <1.0 | <2.0 |
| Copper | mg/kg | 1 | A-T-024s | 478 | 17 | 23 | 28 | 26 | 17 | 18 | 15 | 28 | 20 | 25 | 22 | 17 | 89 | 16 | 38 | 33 | 18 | 39 | 18 | 21 | 14 |
| Chromium | mg/kg | 1 | A-T-024s | 130 | 10 | 12 | 15 | 10 | 10 | 22 | 13 | 25 | 12 | 15 | 13 | 9 | 11 | 12 | 15 | 15 | 14 | 12 | 10 | 12 | 16 |
| Lead | mg/kg | 1 | A-T-024s | 337 | 23 | 35 | 36 | 37 | 24 | 40 | 21 | 18 | 20 | 24 | 20 | 17 | 16 | 13 | 54 | 48 | 33 | 38 | 22 | 26 | 28 |
| Mercury | mg/kg | 0.17 | A-T-024s | 1 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.34 | <0.17 | <0.17 | <0.17 | <0.34 |
| Nickel | mg/kg | 1 | A-T-024s | 50 | 23 | 14 | 25 | 14 | 13 | 14 | 15 | 20 | 18 | 25 | 26 | 17 | 16 | 18 | 15 | 18 | 19 | 21 | 15 | 15 | 19 |
| Selenium | mg/kg | 1 | A-T-024s | 3 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 2 | <1 | <2 | <1 | <1 | <1 | <2 |
| Vanadium | mg/kg | 1 | A-T-024s | 416 | 10 | 15 | 16 | 12 | 13 | 18 | 13 | 22 | 14 | 15 | 13 | 10 | 12 | 13 | 17 | 16 | 18 | 14 | 11 | 15 | 23 |
| Zinc | mg/kg | 1 | A-T-024s | 3280 | 74 | 84 | 118 | 93 | 87 | 152 | 99 | 63 | 70 | 96 | 74 | 64 | 76 | 49 | 112 | 118 | 101 | 108 | 76 | 86 | 91 |
| Benzo(a)pyrene | mg/kg | 0.04 | A-T-019s | 0.90 | 0.21 | 0.16 | 0.35 | 0.2 | 0.1 | 0.24 | 0.2 | 0.11 | 0.12 | 0.2 | 0.08 | 0.1 | <0.04 | <0.04 | <0.04 | 0.06 | 0.15 | 0.07 | 0.1 | 0.23 | <0.04 |
| Vinyl Chloride (Chloroethene) | µg/kg | 1 | A-T-006s | 0.01 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Dichloromethane | µg/kg | 5 | A-T-006s | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| cis 1,2-Dichloroethene | µg/kg | 1 | A-T-006s | 0.04 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,1,1-Trichloroethane | µg/kg | 1 | A-T-006s | 154 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,2-Dichloroethane | µg/kg | 2 | A-T-006s | 4 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| Trichloroethene | µg/kg | 1 | A-T-006s | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Tetrachloroethene | µg/kg | 1 | A-T-006s | 11 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| **Asbestos in Soil (inc. matrix) ^** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Asbestos in soil | | | A-T-045 | | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD |
| Asbestos Matrix (visual) | | | A-T-045 | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Asbestos Matrix (microscope) | | | A-T-045 | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Asbestos ACM - Suitable for Water Absorption Test? | | | A-T-045 | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **TPH CWG with Clean Up** | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ali >C5-C6 | mg/kg | 0.01 | A-T-022s | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Ali >C6-C8 | mg/kg | 0.01 | A-T-022s | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Ali >C8-C10 | mg/kg | 1 | A-T-055s | | <1 | <1 | <1 | <1 | <5 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Ali >C10-C12 | mg/kg | 1 | A-T-055s | | <1 | <1 | <1 | 4 | <5 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 21 | 18 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Ali >C12-C16 | mg/kg | 1 | A-T-055s | | <1 | <1 | <1 | 10 | <5 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 61 | 71 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Ali >C16-C21 | mg/kg | 1 | A-T-055s | | <1 | <1 | <1 | <1 | 8 | <1 | 2 | <1 | <1 | <1 | <1 | <1 | <1 | 2 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Ali >C21-C35 | mg/kg | 1 | A-T-055s | | 3 | 2 | 12 | 5 | 45 | 12 | 22 | 12 | 8 | 13 | 2 | 2 | <1 | 6 | 5 | 4 | 2 | 2 | 3 | 6 | 1 |
| Total Aliphatics | mg/kg | 1 | Calc-As Recd | | 3 | 2 | 13 | 20 | 56 | 13 | 24 | 13 | 9 | 13 | 2 | 2 | 84 | 98 | 5 | 4 | 2 | 2 | 3 | 7 | 1 |
| Aro >C5-C7 | mg/kg | 0.01 | A-T-022s | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Aro >C7-C8 | mg/kg | 0.01 | A-T-022s | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Aro >C8-C10 | mg/kg | 1 | A-T-055s | | <1 | <1 | <1 | <1 | <5 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Aro >C10-C12 | mg/kg | 1 | A-T-055s | | <1 | <1 | <1 | <1 | <5 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 2 | 2 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Aro >C12-C16 | mg/kg | 1 | A-T-055s | | <1 | <1 | <1 | 3 | 27 | <1 | <1 | 2 | <1 | 1 | <1 | <1 | 9 | 9 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Aro >C16-C21 | mg/kg | 1 | A-T-055s | | <1 | <1 | 3 | 2 | 199 | 2 | 5 | 3 | 2 | 2 | <1 | <1 | <1 | <1 | <1 | 1 | <1 | <1 | <1 | 2 | <1 |
| Aro >C21-C35 | mg/kg | 1 | A-T-055s | | 4 | 5 | 15 | 8 | 390 | 11 | 30 | 14 | 7 | 10 | 2 | 3 | <1 | 4 | 3 | 3 | 2 | 2 | 5 | 6 | <1 |
| Total Aromatics | mg/kg | 1 | Calc-As Recd | | 5 | 6 | 19 | 13 | 615 | 14 | 37 | 19 | 10 | 13 | 2 | 4 | 11 | 16 | 3 | 4 | 2 | 2 | 5 | 7 | <1 |
| TPH (Ali & Aro >C5-C35) | mg/kg | 1 | Calc-As Recd | 1717 | 8 | 8 | 32 | 34 | 672 | 27 | 61 | 32 | 18 | 26 | 4 | 6 | 96 | 114 | 8 | 9 | 4 | 4 | 8 | 15 | 1 |
| BTEX - Benzene | mg/kg | 0.01 | A-T-022s | 0.12 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| BTEX - Toluene | mg/kg | 0.01 | A-T-022s | 36 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| BTEX - Ethyl Benzene | mg/kg | 0.01 | A-T-022s | 37 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| BTEX - m & p Xylene | mg/kg | 0.01 | A-T-022s | 32 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| BTEX - o Xylene | mg/kg | 0.01 | A-T-022s | 32 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| MTBE | mg/kg | 0.01 | A-T-022s | | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |

**Client:** Spectrum Geo S
**Client Project Name:** Coed Darcy
**Client Project Ref:** 25061

| Lab Sample ID | Units | Limit of Detection | 25/11651/22 | 25/11651/23 | 25/11651/24 | 25/11651/25 | 25/11651/26 | 25/11651/27 | 25/11651/28 | 25/11651/29 |
|---|---|---|---|---|---|---|---|---|---|---|
| **Client Sample No** | | | | | | | | | | |
| **Client Sample ID** | | | 50 | 51 | 51 | 52 | 53 | 55 | 56 | 57 |
| **Depth to Top** | | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **Depth to Bottom** | | | 0.50 | 0.30 | 0.50 | 0.50 | 0.50 | 0.50 | 0.60 | 0.60 |
| **Date Sampled** | | | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 | 09-Oct-25 |
| **Sample Type** | | | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Soil - ES | Solid |
| **Sample Matrix Code** | | | 6AE | 6AE | 6AE | 6AE | 5AE | 4A | 5A | 7 |
| % Stones >10mm | % w/w | 0.1 | <0.1 | <0.1 | 7.5 | 16.6 | 14.9 | 16.5 | 25.6 | <0.1 |
| Arsenic | mg/kg | 1 | 9 | 9 | 6 | 8 | 10 | 8 | 6 | 5 |
| Cadmium | mg/kg | 1 | <2.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Copper | mg/kg | 1 | 18 | 38 | 25 | 39 | 33 | 28 | 17 | 17 |
| Chromium | mg/kg | 1 | 16 | 17 | 13 | 11 | 11 | 15 | 10 | 13 |
| Lead | mg/kg | 1 | 32 | 37 | 27 | 50 | 65 | 44 | 21 | 29 |
| Mercury | mg/kg | 0.17 | <0.34 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 | <0.17 |
| Nickel | mg/kg | 1 | 20 | 21 | 20 | 22 | 22 | 14 | 12 | 16 |
| Selenium | mg/kg | 1 | <2 | 1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Vanadium | mg/kg | 1 | 22 | 17 | 15 | 11 | 12 | 18 | 11 | 15 |
| Zinc | mg/kg | 1 | 95 | 120 | 86 | 164 | 162 | 205 | 61 | 74 |
| Benzo(a)pyrene | mg/kg | 0.04 | 0.06 | 0.15 | 0.06 | 0.25 | 0.09 | 0.49 | 0.12 | 0.39 |
| Vinyl Chloride (Chloroethene) | µg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Dichloromethane | µg/kg | 5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| cis 1,2-Dichloroethene | µg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,1,1-Trichloroethane | µg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,2-Dichloroethane | µg/kg | 2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| Trichloroethene | µg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Tetrachloroethene | µg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| **Asbestos in Soil (inc. matrix) ^** | | | | | | | | | | |
| Asbestos in soil | | | NAD | NAD | NAD | NAD | NAD | NAD | NAD | NAD |
| Asbestos Matrix (visual) | | | - | - | - | - | - | - | - | - |
| Asbestos Matrix (microscope) | | | - | - | - | - | - | - | - | - |
| Asbestos ACM - Suitable for Water Absorption Test? | | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **TPH CWG with Clean Up** | | | | | | | | | | |
| Ali >C5-C6 | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Ali >C6-C8 | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Ali >C8-C10 | mg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Ali >C10-C12 | mg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Ali >C12-C16 | mg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Ali >C16-C21 | mg/kg | 1 | <1 | 1 | 1 | <1 | <1 | 3 | <1 | 3 |
| Ali >C21-C35 | mg/kg | 1 | 5 | 13 | 4 | 5 | 9 | 61 | 7 | 64 |
| Total Aliphatics | mg/kg | 1 | 5 | 14 | 5 | 5 | 9 | 64 | 9 | 67 |
| Aro >C5-C7 | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Aro >C7-C8 | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Aro >C8-C10 | mg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | 2 | <1 |
| Aro >C10-C12 | mg/kg | 1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| Aro >C12-C16 | mg/kg | 1 | 4 | <1 | <1 | <1 | <1 | 3 | <1 | 1 |
| Aro >C16-C21 | mg/kg | 1 | 5 | 4 | 1 | 2 | 2 | 12 | 2 | 6 |
| Aro >C21-C35 | mg/kg | 1 | 5 | 15 | 3 | 6 | 10 | 68 | 6 | 38 |
| Total Aromatics | mg/kg | 1 | 13 | 19 | 4 | 8 | 12 | 83 | 9 | 46 |
| TPH (Ali & Aro >C5-C35) | mg/kg | 1 | 18 | 33 | 9 | 13 | 22 | 147 | 18 | 112 |
| BTEX - Benzene | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| BTEX - Toluene | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| BTEX - Ethyl Benzene | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| BTEX - m & p Xylene | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| BTEX - o Xylene | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| MTBE | mg/kg | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |







# APPENDIX C

## Relevant Documents

- Integral Geotechnique: Coed D'Arcy – Additional Drilling Investigation and Phase 3 Coal Mining Risk Assessment 30 September 2019
- Integral Geotechnique: Coed D'Arcy – Proof Drilling of Plots 31November 2019
- Integral Geotechnique: Phase 2 Heritage Park, Coed D'Arcy – Planning Condition 11. Planning Application P2019/0021 13 December 2019
- BP Area 1 Remediation. Validation Report. 44382729/BRRP0004. URS 18 January 2010

**Intégral Géotechnique**

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7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991
mail@integralgeotec.com

12494/PD/PB

30 September 2019

Waterstone Homes
Number One
Waterton Park
Bridgend CF31 3PH

**For the attention of Mr Jon Dobbs**

Dear Sirs,

**Coed D'Arcy – Additional Drilling Investigation and Phase 3 Coal Mining Risk Assessment**

Further to your instruction, we confirm that we have recently carried out an additional rotary drilling investigation at the above site, in order to establish the extent of any shallow mine workings beneath the site. We can now report as follows:

***Background***

The 1:50,000 British geological map show that the conjectured outcrop of the both Bodwr and Hughes coal seams are just south of the site and Tank Farm Road. Hence as the strata are believed to dip at approximately 10° to the north, both coal seams and any associated shallow mine workings could underlie the site at shallow depths.

Previously Earth Science Partnership (ESP) carried out a coal mining risk assessment for the site, which included drilling six rotary boreholes across the site to investigate the potential of shallow mine workings being present beneath the site. The borehole findings were given in their Phase 2 Coal Mining Assessment Report reference ESP.7103h.3169, dated April 2019, which should be read in conjunction with this report.

The ESP report identified workable coal seams in three of the boreholes. In addition, some broken ground was encountered in two of the drilled boreholes and was interpreted as probable backfilled working. The report recommended further rotary drilling works to more accurately define the ground subsidence risk zone beneath the site.

***Drilling Works***

The rotary drilling works were carried out by Apex Drilling Services Limited in September 2019. The hydraulically operated drilling rigs used compressed air and water as the flushing medium.

The borehole locations are shown on the attached plan and the borehole logs, which are based on the driller's logs, are presented in Appendix A.

In order to confirm the approximate extent of the area that is underlain at shallow depths by the Bodwr and Hughes coal seam and any associated mine workings, thirty boreholes were drilled across the site using a Beretta T44 rotary drilling rig.

The boreholes were drilled down to a maximum depth of 31.5m, in order to prove the extent and depths of any underlying shallow coal seams and/or associated mineworkings.

The rockhead was encountered at depths ranging from the site surface down to 2.6mbgl, while the coal seams or associated workings were found to increase in depth northwards.

***Mining***

Southern Area

Workable coal seams with occasional associated mine workings were only encountered at shallow depths beneath the south-central part of the site. These coal seams are thought to be the Bodwr and the underlying Hughes seams, which had a vertical separation of approximately 13m to 14m.

From the drilling results, only two of the thirty boreholes encountered any mine workings beneath the site. These boreholes were IG1 and IG17 both of which located beneath the southern half of the site. IG1 encountered 1.6m of broken ground at 16.7mbgl, while IG17 encountered 1.1m of broken ground at 26.1mbgl, in both cases at the horizon of the Bodwr seam.

In boreholes IG2, IG7 and IG8, together with the previous boreholes DH101 and DH102, the Bodwr seam was found to range in thickness between 1.0m and 1.3m. In addition, as discussed above, 1.6m of broken ground which was thought to be backfilled or collapsed workings, was encountered at the horizon of the Bodwr seam in borehole IG1.

To the east and west of this south-central area, the seam thickness was found to typically reduce to between 0.5m and 1.0m.

In addition to the Bodwr seam, IG7, IG8 and IG9 encountered an underlying banded coal seam, thought to be the Hughes seam, at depths ranging from 26.3mbgl to 29.6mbgl, with a seam thickness ranging from 0.7m to 1.8m.

The general convention for coal mining subsidence risk, is that the rock cover thickness should be ten times the height of the coal working, in order to prevent associated roof collapse migrating up to the surface.

Therefore, based on the seam thickness proved in the boreholes, some 13 to 16m of rock cover would be required above the Bodwr seam in the central area, reducing (with the seam thickness) to 10m to the east and west.

In the case of the deeper Hughes seam, some 18m of rock cover would be required, based on its seam thickness proved in IG8.

Based on these rock cover requirements, there is insufficient cover above the Bodwr seam in the south-central area and therefore there is thought to be a high potential risk of mining-related surface subsidence occurring in the zone highlighted red on Figure 1.

As already discussed, the boreholes proved that the Bodwr seam thins to the east and west of the south-central area. The boreholes did not encounter any evidence of associated workings in these areas. In addition, given the thinner nature of the seam in these parts, there is sufficient overlying rock cover to prevent any mining subsidence reaching the surface, should any unrecorded workings be present in these areas.

The boreholes also established that the underlying Hughes seam is generally deeper than 30m beneath most of the site. Only a few of the boreholes near the southern boundary encountered this seam some 13m to 14m below the Bodwr seam. In these boreholes the Hughes seam was deeper than 25m, with well over 18m of rock cover. It is therefore considered that, if there are any associated workings in the Hughes seam, they would be too deep to present a mining subsidence risk to the site.

North and Central Areas

The fifteen boreholes IG15 to IG30 drilled in northern and central parts of the site typically did not encounter any coal down to 30m depth. Only IG26 and IG28 encountered an intact coal seam of any note, but this was only 0.7m thick and had sufficient overlying rock cover. Previously, the ESP report discussed a potential mining risk in this area and possible faulting, due to their boreholes DH104 and DH106 encountering broken ground at 18.5mgbl and 13.5mbgl respectively. However, none of the nearby Intégral Géotechnique boreholes found any evidence of mine workings or any workable coal seams. It is therefore believed that these ESP boreholes encountered some localised, possibly fault-related, natural fractures within the rock strata, which ESP misconstrued as probable workings. Hence, in light of the findings from the numerous additional boreholes that have been drilled, there is not considered to be a shallow mining risk in this area of the site.

***Mining Recommendations***

The southern central part of the site shaded red on Figure 1, has been identified as having a high potential risk of mining subsidence associated with potential old shallow workings in the Bodwr seam. However, the extent of this potential high-risk mining subsidence zone, is significantly less than the subsidence risk zones initially postulated by ESP in their report.

Although no voids and only limited evidence of old collapsed or backfilled workings have been found to date, it is recommended that a plot by plot proof drilling exercise is carried out across this high potential risk zone as a precaution.

Subject to the thickness of rock cover proved above the Bodwr coal seam/workings, follow-on drilling and grouting ground stabilisation works may subsequently be considered necessary, if the proof drilling boreholes should encounter uncollapsed or partially collapsed shallow workings in the Bodwr seam, with insufficient overlying rock cover to prevent potential surface subsidence.

The extent of the potential high-risk mining subsidence zone has been based on a requirement of 16m of rock cover above the seam/associated workings, based on the 1.6m of broken ground which was encountered at the Bodwr horizon in the IG1 borehole. However, based on the maximum 1.3m seam thickness proved in the nearby boreholes, the 1.6m of broken ground may include some roof collapse.

This rock cover thickness guideline should be reviewed in light of additional findings from the recommended proof drilling works.

If the recommended proof drilling boreholes should consistently prove that the seam/associated workings are consistently thicker or thinner than 1.6m, then the required rock cover thickness may need to be adjusted accordingly.

The proof drilling works should be carried across this potential high-risk mining subsidence zone prior to any development of this part of the site. If the proof drilling should encounter uncollapsed or partially collapsed shallow workings in the Bodwr seam with insufficient overlying rock cover, then follow-up drilling and grouting stabilisation works may become necessary.

The underlying Hughes seam has been proved to be generally deeper than 30m depth and to have more than 20m of overlying competent rock cover, so it is not considered to represent a mining risk to the site development.

***Mine Gas Risk***

The ESP report postulated a potential risk of mine gases migrating up to the site's surface from possible underlying old workings, as a result of a possible fault crossing the site.

Apart from some broken ground being encountered in two of ESP's boreholes, none of the recent additional boreholes have encountered any evidence for a fault crossing the site. Neither is there any visible evidence in the nearby rock face that runs along the western boundary of the site. Nevertheless, a number of standpipes have been installed as a precaution, in order to carry out a gas monitoring programme.

Based on the preliminary round of readings, insignificant levels of methane and carbon dioxide have been measured so far and no gas flows have been detected.

An addendum report with a full set of gas readings and our concluding assessments and recommendations will be issued in due course, on completion of the whole gas monitoring programme.

It should be noted that the URS Validation Report ref. 44382729/BRRP0004 Issue No 1 of 18 January 2010 advises that a vapour (VOC and TPH) resistant membrane to provide a low permeability barrier against ingress of gas into the building fabric and a passive venting layer to all buildings.

We trust that the above is to your satisfaction. However, if you have any queries or require any further information, please do not hesitate to contact us.

Yours faithfully,

D. P. Davies

**D P Davies**
**For**
**Intégral Géotechnique (Wales) Limited**

Enc

# Appendix A

# Rotary Borehole Logs

| Intégral Géotechnique | Intégral House, 7 Beddau Way<br>Castlegate Business Park<br>Caerphilly CF83 2AX<br>Tel. 029 20807991<br>Fax. 029 20862176<br>mail@integralgeotec.com | Project Name:<br>**Coed Darcy** | Project No.:<br>**12494** | Borehole No.:<br>**IG1**<br>Sheet 1 of 1 |
|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>06/09/2019 - | Logged By:<br>PD |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |
| | | | | | | | 0.30 | | | | Clay<br>Sandstone |
| | | 0.00 - 30.00 | | | | | | | | | |
| | | | | | | | 16.70 | | | | Backfilled workings very wet (1.6m) retained flush |
| | | | | | | | 18.30 | | | | Sandstone and Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole wet at 16.7m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 06/07/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG2** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 09/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.90 | | | | Boulder Clay |
| | | 0.00 - 30.00 | | | | | | | | | Sandstone and Mudstone bands |
| | | | | | | | 23.40 | | | | Coal (1.1m) |
| | | | | | | | 24.50 | | | | Sandstone and Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 09/09/2019. Gas monitoring standpipe installed at 3.0m

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG3** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 09/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 0.90 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone and Mudstone bands |
| | | | | | | | 21.70 | | | | Coal (0.6m) |
| | | | | | | | 22.00 | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**
Borehole wet at 10.0m. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 09/09/2019

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG4** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 17/09/2019 - / Logged By: |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |

**Remarks:**

Dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 17/09/2019. Starter pit excavated to 0.6m

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG5** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 18/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.30 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone |
| | | 0.00 - 30.50 | | | | | 14.70 | | | | Coal (0.6m) |
| | | | | | | | 15.30 | | | | Mudstone |
| | | | | | | | 17.80 | | | | Coal (0.4m) |
| | | | | | | | 18.20 | | | | Mudstone |
| | | | | | | | 26.60 | | | | Broken Ground (2.9m) |
| | | | | | | | 29.50 | | | | Mudstone |
| | | | | | | | 30.50 | | | | End of Borehole at 30.50 m |

**Remarks:**

Borehole wet at 177m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 16/09/2019. Starter pit excavated to 0.3m

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG6** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 17/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring: Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.70 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone and Mudstone bands |
| | | | | | | | 9.20 | | | | Coal (0.1m) |
| | | | | | | | 9.30 | | | | Mudstone and Sandstone bands |
| | | | | | | | 11.20 | | | | Coal (0.4m) |
| | | | | | | | 11.60 | | | | Mudstone and Sandstone bands |
| | | 0.00 - 30.00 | | | | | 14.70 | | | | Coal (0.2m) |
| | | | | | | | 14.90 | | | | Mudstone |
| | | | | | | | 15.20 | | | | Coal (0.3m) |
| | | | | | | | 15.50 | | | | Mudstone and Sandstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 17/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG7** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 05/09/2019 - / Logged By: |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |

**Remarks:**

Borehole wet at 12.0m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 05/06/07/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>06/09/2019 - | Logged By:<br>PD |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |
| | | | | | | | 1.00 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone and Mudstone bands |
| | | | | | | | 11.80 | | | | Coal (1.1m) |
| | | | | | | | 12.90 | | | | Sandstone and Mudstone bands |
| | | 0.00 - 31.00 | | | | | | | | | |
| | | | | | | | 26.30 | | | | Banded Coal (1.8m) |
| | | | | | | | 29.00 | | | | Mudstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole wet at 9.0m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 06/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG9** Sheet 1 of 1 |

| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
|---|---|---|---|
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 16/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Boulder Clay |
| | | | | | | | 2.60 | | | | Weathered Sandstone |
| | | | | | | | 5.80 | | | | Broken Ground and Coal (0.5m) |
| | | | | | | | 6.30 | | | | Mudstone and Sandstone bands |
| | | 0.00 - 31.00 | | | | | 15.10 | | | | Coal (0.4m) |
| | | | | | | | 15.50 | | | | Mudstone and Sandstone bands |
| | | | | | | | 29.60 | | | | Coal (0.7m) |
| | | | | | | | 30.20 | | | | Mudstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole wet at 16.7m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 16/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG10** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 16/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.50 | | | | | 2.40 | | | | Boulder Clay |
| | | | | | | | 7.30 | | | | Sandstone |
| | | | | | | | 7.40 | | | | Coal (0.1m) |
| | | | | | | | 16.60 | | | | Mudstone and Sandstone bands |
| | | | | | | | 17.10 | | | | Coal (0.5m) |
| | | | | | | | 30.50 | | | | Mudstone and Sandstone bands with occasional coal traces |
| | | | | | | | | | | | End of Borehole at 30.50 m |

**Remarks:**

Borehole wet at 7.0m. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 16/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG11** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 09/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | | | | | Sandstone |
| | | | | | | | 22.10 | | | | Coal (0.6m) |
| | | | | | | | 23.00 | | | | Sandstone |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**
Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 09/09/2019

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG12** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 09/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 31.00 | | | | | | | | | Sandstone |
| | | | | | | | 28.20 | | | | Coal (0.6m) |
| | | | | | | | 28.80 | | | | Sandstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 09/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>09/09/2019 - | Logged By:<br>PD |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |
| | | 0.00 - 30.00 | | | | | | | | | Sandstone |
| | | | | | | | 27.50 | | | | Coal (0.6m) |
| | | | | | | | 28.10 | | | | Sandstone |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 09/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG14** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 10/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 31.00 | | | | | | | | | Sandstone |
| | | | | | | | 28.30 | | | | Coal (0.7m) |
| | | | | | | | 29.00 | | | | Sandstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 10/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG15** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 10/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | | | | | Sandstone |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**
Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 10/09/2019

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG16** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 11/09/2019 - / Logged By: |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 30.00 | | | | Sandstone with Mudstone bands |
| | | | | | | | | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 11/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>16/09/2019 - | Logged By:<br>PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 31.00 | | | | | 0.90 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone |
| | | | | | | | 23.00 | | | | Coal (1.2m) |
| | | | | | | | 24.20 | | | | Mudstone and Sandstone bands |
| | | | | | | | 26.10 | | | | Broken Ground |
| | | | | | | | 27.20 | | | | Mudstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole wet at 14.5m. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 16/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>16/09/2019 - | Logged By:<br>pD |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |
| | | 0.00 - 30.00 | | | | | | | | | Sandstone |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 16/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG19** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 11/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 16.00 | | | | Sandstone |
| | | | | | | | 30.00 | | | | Sandstone and Mudstone bands |
| | | | | | | | | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole wet at 25m. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 11/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG21** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 12/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 30.00 | | | | Sandstone with Mudstone bands<br>End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 12/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG22** Sheet 1 of 1 |
| Location: / Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig / Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: / Depth of Casing: | Dates 12/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 30.00 | | | | Sandstone<br>End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 12/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG23** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 12/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 31.00 | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 28.90 | | | | Soft Broken Ground (retained flush 0.8m) |
| | | | | | | | 29.70 | | | | Sandstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 12/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG24** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 13/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring: Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 1.90 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole wet at 12.0m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 13/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG25** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 12/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 2.50 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**
Borehole dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 12/09/2019.

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>18/09/2019 - | Logged By:<br>PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.70 | | | | Boulder Clay |
| | | | | | | | 3.20 | | | | Sandstone with some coal traces |
| | | | | | | | 6.70 | | | | Sandstone |
| | | | | | | | 6.90 | | | | Coal (0.2m) |
| | | | | | | | 9.10 | | | | Sandstone |
| | | | | | | | 9.80 | | | | Coal (0.7m) |
| | | | | | | | 13.50 | | | | Sandstone and Mudstone bands |
| | | 0.00 - 30.00 | | | | | 14.10 | | | | Coal (0.6m) |
| | | | | | | | 30.00 | | | | Sandstone and Mudstone bands with some coal traces |
| | | | | | | | | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry Air/water used as flushing medium. Description based on drillers logs. Date drilled 18/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG27** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 13/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 1.70 | | | | Boulder Clay |
| | | | | | | | 30.00 | | | | Sandstone with Mudstone bands |
| | | | | | | | | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole wet at 23.0m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 13/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG28** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 18/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.50 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone with some coal traces |
| | | | | | | | 8.90 | | | | Coal (0.2m) |
| | | | | | | | 9.10 | | | | Mudstone |
| | | | | | | | 9.70 | | | | Coal |
| | | | | | | | 9.90 | | | | Sandstone |
| | | | | | | | 11.20 | | | | Coal (0.7m) |
| | | | | | | | 11.90 | | | | Sandstone and Mudstone bands |
| | | 0.00 - 30.50 | | | | | 15.40 | | | | Coal (0.6m) |
| | | | | | | | 16.00 | | | | Sandstone and Mudstone bands |
| | | | | | | | 30.50 | | | | End of Borehole at 30.50 m |

**Remarks:**
Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 18/09/2019

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

AGS

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Fax. 029 20862176
mail@integralgeotec.com

| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG29** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 13/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 1.20 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 13/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG29** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 11/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | | | | | Sandstone and Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**
Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 11/09/2019

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | Project No.: **12494** | Borehole No.: **IG30** Sheet 1 of 1 | |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 11/09/2019 - | Logged By: PD |

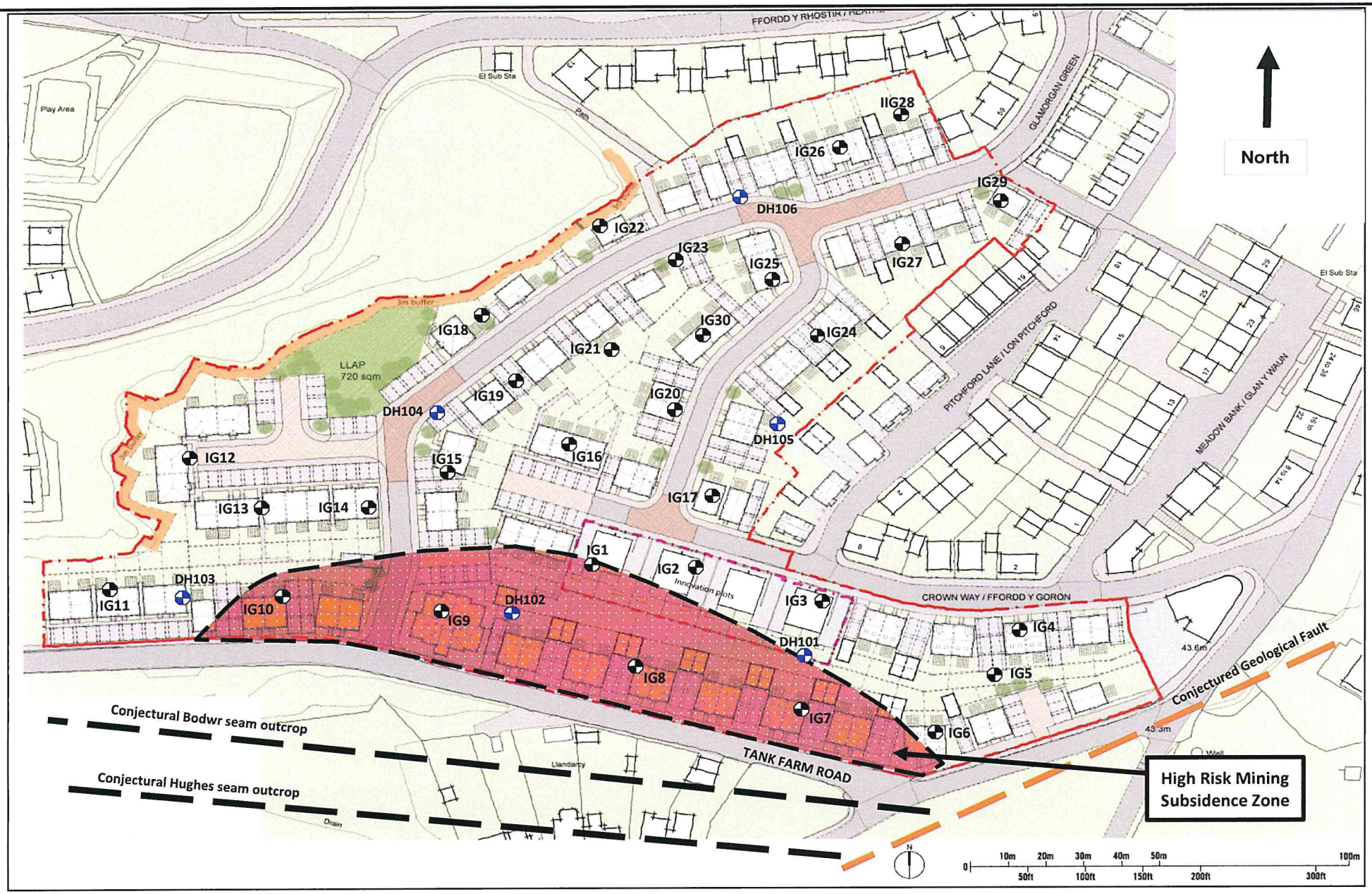
| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 30.00 | | | | Sandstone and Mudstone bands<br>End of Borehole at 30.00 m |

**Remarks:**
Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 11/09/2019

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

AGS

**Figure**




IG1 Approximate location of Integral Geotechnique Rotary Borehole September 2019

DH101 Approximate location of ESP Rotary Borehole April 2019

**Figure 1 - SITE LAYOUT**

**Phase 2, Coed Darcy**

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12494/PD/HP

31 November 2019

Jehu Group
Number One
Waterton Park
Bridgend CF31 3PH

**For the attention of Mr Jon Dobbs**

Dear Sirs,

**Coed D'Arcy – Proof Drilling of Plots**

Further to your instruction, we confirm that we have recently carried out the rotary proof drilling works beneath the above site, in order to establish the potential shallow mine workings risk beneath the above plots (highlighted in red on the attached Figure 1). We are now able to report as follows:

This report (including all appendices to it and any subsequent addendums or correspondence) has been prepared for the sole benefit, use and information of Jehu Group and no third party is entitled or permitted to rely upon it. This report may not be used, reproduced or circulated (in whole or part) for any purpose without the written consent of Intégral Géotechnique (Wales) Limited. Intégral Géotechnique (Wales) Limited shall not be liable to any third party who does not have such express written permission to rely on the report for any losses they may suffer.

***Background***

Previously Intégral Géotechnique carried out a coal mining risk assessment beneath the site, which entailed drilling thirty rotary borehole across the site in order to more clearly define the shallow mining risk across the site. The findings of these works were given in our letter report reference 12494/PD/PB dated 30 September 2019.

The report identified the above plots to be in a high-risk mining subsidence zone and recommended proof drilling in order to establish whether a programme of ground stabilisation by drilling and grouting would be required to infill any shallow mine workings beneath the plots.

***Drilling Works***

A permit to enter or disturb Coal Authority Mining Interests was obtained from the Coal Authority to undertake the drilling works, Permit No 18988.

The rotary drilling works were carried out by Apex Drilling Services Limited in November 2019. Thirty-Nine boreholes were drilled beneath the above plots by using either a Fraste or a Klemm rotary drilling rig. The hydraulically operated drilling rigs used compressed air and water as the flushing medium.

The borehole locations are shown on the attached plan and a summary borehole table, which is based on the driller's logs, are presented in Appendix A.

The rotary probeholes were drilled between approximately 10 to 23mbgl. Superficial deposits were encountered between 0.0 to 7.2mbgl and thereafter encountered bands of sandstone or mudstone and the Bodwr coal seam.

The thickness of the Bodwr coal seam recorded ranged from 0.2m to 1.1m, at depths ranging from 3.5 to 20.5mbgl but, a 2.0m coal with a mudstone parting was encountered in P25. The Bodwr coal seam was not encountered in P31 which indicated that it had outcropped at this location and together with the varying thickness of the Bodwr coal seam encountered, indicates that some faulting is present in the area.

No shallow mine workings were encountered in any of the nine probeholes drilled.

**Recommendations**

No shallow mine workings have been encountered in any of the thirty-nine probeholes drilled or the previous drilling carried out.

Hence, no precautionary measures are required beneath any of the plots on site for shallow mine workings.

We trust that the above is to your satisfaction. However, if you have any queries or require any further information, please do not hesitate to contact us.

Yours faithfully,

D. P. Davies

**D P Davies**
**For**
**Intégral Géotechnique (Wales) Limited**

Enc

# Appendix A

# Probehole Summary Table

**Proof Drilling Coed Darcy 12494/PD/19** **Jehu** **November 2019**

## Probehole Summary Table

| PH No | Depth (m) | Depth Rock (m) | Depth to Coal (m) | Rock Cover (m) | Comments |
|---|---|---|---|---|---|
| P1 | 15.0 | 0.3 | 11.0-11.5=0.5 | 10.7 | |
| P2 | 15.0 | 0.8 | 7.0-7.2=0.2 | 6.2 | |
| P3 | 23.5 | 3.5 | 21.6-22.5=0.9 | 18.1 | |
| P4 | 21.5 | 3.2 | 19.6-20.5=0.9 | 16.4 | |
| P5 | 23.0 | 1.4 | 20.2-21.0=0.8 | 18.8 | |
| P6 | 20.5 | 6.2 | 18.5-19.5=1.0 | 12.3 | |
| P7 | 17.5 | 7.2 | 15.5-10.4=0.9 | 8.3 | |
| P8 | 23.0 | 1.1 | 20.5-21.2=0.7 | 19.4 | |
| P9 | 19.6 | 3.0 | 17.9-18.6=0.7 | 14.9 | |
| P10 | 13.5 | 3.5 | 11.7-12.5=0.8 | 8.2 | |
| P11 | 10.0 | 3.4 | 8.0-8.8=0.8 | 4.6 | |
| P12 | 23.0 | 1.3 | 7.5-8.2=0.7 | 6.2 | |
| P13 | 16.7 | 3.3 | 15.0-15.7=0.7 | 11.7 | |
| P14 | 15.0 | 0.6 | 8.8-9.5=0.7 | 8.2 | |
| P15 | 23.0 | 2.1 | 12.3-13.0=0.7 | 10.2 | |
| P16 | 23.0 | 2.7 | 6.3-7.2=0.9 | 3.6 | |
| P17 | 15.0 | 0.4 | 5.2-5.9=0.7 | 4.8 | |
| P18 | 23.0 | 2.3 | 8.9-10.0=1.1 | 6.6 | |
| P19 | 15.0 | 3.9 | 9.0-9.6=0.6 | 5.1 | |
| P20 | 15.0 | 2.2 | 10.0-11.5=1.5 | 7.8 | |
| P21 | 23.0 | 0.1 | 4.0-4.5=0.5 | 3.9 | |
| P22 | 23.0 | 0.6 | 8.2-8.8=0.6 | 7.6 | |
| P23 | 15.9 | 1.0 | 3.5-4.5=1.0 | 2.5 | |
| P24 | 15.0 | 0.0 | 9.5-10.0=0.5 | 9.5 | |
| P25 | 23.0 | 4.0 | 19.0-21.0=2.0 | 15.0 | (Mudstone band in Coal) |
| P26 | 15.0 | 2.6 | 2.9-3.2=0.3 | | (Dirty Coal) |
| P27 | 15.0 | 1.1 | 7.1-7.7=0.6 | 6.0 | |
| P28 | 18.0 | 0.6 | 14.5-15.0=0.5 | | |
| P29 | 15.0 | 1.2 | 7.0-7.6=0.6 | 5.8 | |
| P30 | 23.0 | 2.4 | 14.5-15.0=0.5 | 16.6 | (Mudstone band in Coal) |
| P31 | 15.0 | 3.0 | | | Coal outcropped |
| P32 | 15.0 | 0.6 | 12.1-12.8=0.8 | 11.5 | |
| P33 | 20.0 | 0.6 | 16.5-17.1=0.6 | 15.9 | |
| P34 | 18.0 | 1.5 | 13.8-15.0=1.2 | 12.3 | |
| P35 | 23.0 | 0.7 | 13.0-14.0=1.0 | 12.3 | |
| P36 | 15.0 | 0.7 | 8.5-9.2=0.7 | 7.8 | |
| P37 | 15.0 | 1.6 | 7.0-8.0=1.0 | 5.4 | |
| P38 | 15.0 | 0.7 | 11.0-12.0=2.1 | 10.3 | |
| P39 | 15.0 | 0.7 | 6.5-7.2=0.7 | 5.8 | |

**Figure**




IG1 Approximate location of Integral Geotechnique Rotary Borehole September 2019

DH101 Approximate location of ESP Rotary Borehole April 2019

Location of Prpposed Plot Proof Drilling Borehole October 2019

Location of Prpposed Plot Proof Drilling Borehole November 2019

**Figure 1 - SITE LAYOUT Plot Proof Drilling**

**Phase 2, Coed Darcy**


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12494/HP

13 December 2019

Waterstone Homes
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Waterton Park
Bridgend
CF31 3PH

**For the attention of Mr Jon Dobbs**

Dear Sirs,

**Phase 2 Heritage Park, Coed Darcy – Planning Condition 11. Planning Application: P2019/0021**

We understand that the above condition requires as part of the first reserved matters application an assessment of the nature and extent of contamination affecting the application site area. Our assessment of the contamination concerns at the development site is as follows:

***Background***

The site has been previously subject of extensive site investigation works carried out by URS Corporation Limited. These site investigation works formed the basis of the URS remediation strategy for the site.

This remediation strategy was approved by Neath Port Talbot County Borough Council (NPTCBC) in 2006. Copies of the NPTCBC Approval Details documentation for the remediation scheme are presented in Appendix A.

URS Corporation Limited subsequently monitored and validated the remediation works. The remediation works were the subject of URS's "BP Area 1 Remediation Validation Report of 18 January 2010 Issue No 144382729 / BRRP0004.

This validation report covers both the previous Phase 1 Heritage Park Development and the Phase 2 Heritage Park Development.

A copy of the URS validation report is presented in Appendix B.

URS's BP Area 1 Remediation Validation Report of 18 January 2010 Issue No 144382729 / BRRP0004 has previously been submitted to and approved by NPTCBC and the NRW when submitted in support of Phase 1 Heritage Park development, allowing planning condition (ref. P/2000/1284) No. 8 to be discharged.

Accordingly it is now submitted in support of the Phase 2 Heritage Park Development.

***Further Remediation Requirements of the URS Validation Report***

The URS report requires further remediation activities to be carried out during the course of the development. These are listed below:

- Once the site has been profiled and construction has advanced to the point that property boundaries are known with confidence, the soil which will form the second half metre below finished level in garden areas is required to be turned over mechanically or placed in a controlled manner by the contractor and subject to visual inspection. Final validation sampling of site derived soil in the gardens of plots;

- Testing of any imported soils/materials used in the development works;

- As a precautionary measure, whilst remedial works have been undertaken within the area of the former solvent pit, the Developer is prevented by the terms of the development agreement with BP from constructing residential dwellings within the Solvent Exclusion Zone. The development levels are to be set such that there is slight convex profile to the landform promoting runoff away from infilled pit with a minimum thickness of 0.5m of site derived natural clay material placed as sub-soil extending over the infilled pit. The contractor shall determine the depth of topsoil to be placed over this area to provide sufficient depth for vegetation growth.

- A vapour resistant membrane is required to be incorporated by the developer into each house or other building likely to be routinely occupied by people. The membrane is required to provide a low-permeability barrier against the ingress of any gas from the ground into the building fabric. The membrane is required to have a design life of 60 years and all services and other penetrations through the vapour resistant membrane are required to be properly sealed. Passive venting is also required to all habitable structures in the form of either a highly permeable, lightly compacted granular layer at least 200mm thick beneath a reinforced concrete floor slab (incorporating a vapour membrane), or a ventilated sub-floor void.

Note that in the passage of time since the 2010 validation report approximately 5,000m3 of rock and clay soil have been imported to the Phase 2 Area of Heritage Gate.

Accordingly in addition to the above bullet points there is a requirement to take representative samples of the stockpiled materials, carry out laboratory contamination testing and risk assessments for the imported materials reuse on site.

***Actions in Support of Further Remediation Requirements of the URS Validation Report***

Remediation Actions in support of the URS requirements are as follows:

- All garden areas to be capped as the development progresses with 600mm of inert residential quality capping subsoil and topsoil placed over an anti-mixing membrane. All garden capping works to be subject to compliance contamination testing, risk assessment and independent geotechnical consultancy certification.

- All imported soils to be pre certified and / or subject to compliance contamination testing, risk assessment and independent geotechnical consultancy certification.

- The solvent pit area has been treated as a no build zone. The development levels are set such that there is slight convex profile to the landform with a minimum thickness of 0.5m of site derived natural clay material placed as sub-soil extending over the infilled pit. All capping works to this area will be subject to compliance contamination testing, risk assessment and independent geotechnical consultancy certification.

- All buildings will be provided with ground gas protection measures as per typical details shown on the Roberts Limbrick drawings enclosed within Appendix C:

    - Suspended Floor – Gas Membrane Detail. Drawing. No. 9117/1029 Rev B
    - Retaining Garage Wall Tanking Detail Plots 7-11 Single Garage. Drawing. No. 9117/1028 Rev B
    - External Wall Tanking Detail Plot 6 House Type N. Drawing. No. 9117/1027 Rev B

  The Roberts Limbrick details incorporate a ventilated sub floor void and a RIW Gas Seal HC membrane which is resistant to VOC and TPH vapours. This is compliant with URS's recommendations. All services and other penetrations through the vapour resistant membrane should be properly sealed using sealed RIW Gas Seal HC membrane top hat details.

The approximately 5,000m3 of rock and clay soil have been imported to the Phase 2 Area of Heritage Gate has been subject to representative sampling, laboratory contamination testing and risk assessment. The materials were found to be uncontaminated and do not require further remediation works.

A copy of the Integral Geotechnique report covering these works is presented in Appendix D.

***Additional Ground Gas Risk Assessment Works***

As part of the Phase 3 Coal Mining Risk Assessment for the Phase 2 Heritage Park development mine working related ground gas monitoring was undertaken in the area of the suspected geological fault. No problematic level of ground gases detected. For completeness a copy of the Phase 3 Coal Mining Risk Assessment Report is enclosed in Appendix E.

We trust that the above is to your satisfaction. However, if you have any queries or require any further information, please do not hesitate to contact us. In the meantime, we await your further instructions.

Yours faithfully,

**Huw Pritchard**
**For**
**Intégral Géotechnique (Wales) Limited**

| | |
|---|---|
| Appendix A | NPTCBC Approval of Details Documents |
| Appendix B | URS BP Phase 1 Validation Report |
| Appendix C | Roberts Limbrick Ground Gas Protection Details |
| Appendix D | IG Imported Soil Risk Assessment Report |
| Appendix E | IG Phase 3 Ground Gas Risk Assessment Report |

# APPENDIX A

## NPTCBC APPROVAL OF DETAILS DOCUMENTS

**Reference No: P/2006/1045**

*3D900*

**NEATH PORT TALBOT COUNTY BOROUGH COUNCIL**
**CYNGOR BWRDEISTREF SIROL CASTELL-NEDD PORT TALBOT**

**TOWN AND COUNTRY PLANNING ACT 1990**
**THE TOWN AND COUNTRY PLANNING (GENERAL DEVELOPMENT PROCEDURE) ORDER 1995**

**APPROVAL OF DETAILS**

| Name and address of the applicant | Name and Address of the agent |
|---|---|
| **BP OIL REFINERY LTD UK**<br>**TECHNICAL BUILDING**<br>**LLANDARCY**<br>**NEATH**<br>**SA10 6EL** | **URS CORPORATION LTD**<br>**COMPANY HOUSE**<br>**TOWER HILL**<br>**BRISTOL**<br>**BS2 0EQ** |

Whereas on the Thursday, 27 July 2006 you submitted an application for the following development:-

PROPOSAL AGREE CONDITION 8 OF PLANNING APPLICATION P/05/809 WITH REGARD TO THE SUBMISSION OF A SCHEME FOR REMEDIATION.

LOCATION BP OIL REFINERY LTD UK LLANDARCY NEATH

**THE NEATH PORT TALBOT COUNTY BOROUGH COUNCIL AS THE LOCAL PLANNING AUTHORITY IN PURSUANCE OF ITS POWER UNDER THE ABOVE MENTIONED ACT AND ORDER HEREBY APPROVES THE DETAILS:**

Signed : .....
**Geoff White – Head Of Planning**

Date : 01/09/2006

Cont.

DECNAD

Planning – Historic Decision Notice

**Reference No: P/2006/1049**



**NEATH PORT TALBOT COUNTY BO**
**CYNGOR BWRDEISTREF SIROL CASTELL-NEDD**

**TOWN AND COUNTRY PLANNING ACT 1990**
**THE TOWN AND COUNTRY PLANNING (GENERAL DEVELOPMENT PROCEDURE) ORDER 1995**

**APPROVAL OF DETAILS**

| **Name and address of the applicant** | **Name and Address of the agent** |
|---|---|
| **BP OIL REFINERY LTD UK**<br>**LLANDARCY**<br>**NEATH** | **URS CORPORATION LTD**<br>**COMPANY HOUSE**<br>**TOWER HILL**<br>**BRISTOL**<br>**BS2 0EQ** |

Whereas on the Thursday, 27 July 2006 you submitted an application for the following development:-

PROPOSAL AGREE CONDITION 8 OF PLANNING APPLICATION P/2006/1287 WITH REGARD TO THE SUBMISSION OF A SCHEME FOR REMEDIATION

LOCATION BP OIL REFINERY UK LLANDARCY NEATH

**THE NEATH PORT TALBOT COUNTY BOROUGH COUNCIL AS THE LOCAL PLANNING AUTHORITY IN PURSUANCE OF ITS POWER UNDER THE ABOVE MENTIONED ACT AND ORDER HEREBY APPROVES THE DETAILS:**

Signed : .....
**Geoff White – Head Of Planning**

Date : 01/09/2006

Cont.

DECNAD

# APPENDIX B

## URS VALIDATION REPORT BP PLASE 1

# BP Area 1 Remediation

# Validation Report

18 January 2010
Draft

Issue No 1
44382729 / BRRP0004

**Project Title:** BP Area 1 Remediation

**Report Title:** Validation Report

**Project No:** 44382729

**Report Ref:** BRRP0004

**Status:** Draft

**Client Contact Name:** Mr. David Toman

**Client Company Name:** BP Llandarcy Refinery Ltd

**Issued By:**

**Document Production / Approval Record**

| **Issue No: 1** | **Name** | **Signature** | **Date** | **Position** |
|---|---|---|---|---|
| Prepared by | Alex Cowin, Caroline Ewen, Gemma Radcliffe |  | 18 January 2010 | Environmental Consultant |
| Checked by | Steve Coates |  | 18 January 2010 | Associate Director |
| Approved by | David Pollok |  | 18 January 2010 | Project Director |

**Document Revision Record**

| **Issue No** | **Date** | **Details of Revisions** |
|---|---|---|
| 1 | 18 January 2010 | Original issue |
| | | |
| | | |
| | | |

**LIMITATION**

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Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant delay in using this Report.

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# 1. INTRODUCTION

## 1.1. General Introduction

As part of the regeneration of the former BP Llandarcy oil refinery site (referred to herein as the 'main site'), URS Corporation Limited (URS) was commissioned by BP to develop a remediation strategy for a specific part of the site known as 'Area 1' ('the site'). The site location is shown in Figure 1 with the remediation boundary defining the extent of Area 1. Figure 2 shows the Area 1 site layout.

Following regulatory acceptance (provided in Appendix A) of the remediation strategy (also provided in Appendix A), the remediation of Area 1 was undertaken between 5th February 2007 and 29th June 2009. This validation report summarises the remediation and validation works undertaken and their rationale, presenting the validation data and comparing it with the remedial criteria that have been set.

The contents of this report generally reflects the guidance included in the following two documents:

- Environment Agency Contaminated land Report 11, Model Procedures for the Management of Land Contamination
- Environment Agency Science Report, Verification of Remediation of Land Contamination

This includes:

- Background information and the reason for undertaking the remediation
- Details of the remediation strategy
- Details of the remediation works undertaken
- Details of the validation process
- The results of the physical and chemical testing undertaken
- Correspondence with the planning authority during the remediation process
- Discussion of the final condition of the site

The remediation works described below are the culmination of an iterative series of desk top assessment, site investigation, environmental and health risk assessment and remedial strategy development. The principal supporting works are summarised below and described more fully in:

- Environmental Liability Assessment, Phase 1 Desk Study, Llandarcy Refinery, Volume 1 - Desk Study Findings, Ref 2048R/37491-001-411/ICL dated 29 September 1997

- Environmental Liability Assessment, Phase 1 Desk Study, Llandarcy Refinery, Volume 2 - Interpretative Report, Ref: 2049R/37491-001-411/ICL, dated 30 September 1997
- Observations on Removal of Underground Storage Tank, November 2002 (URS Memo, 15th November 2002) plus location plan;
- Draft Factual Report for the Phase I Site Investigation at BP Llandarcy Refinery ref: 39991-035-785/DR1140, dated 10th July 2003;
- 'Draft Addendum Report Asbestos Assessment, Phase I Area, BP Llandarcy Refinery', ref: 39991-035-785/DR1170 dated 3rd October 2003;
- 'Asbestos Delineation Works, Former BP Car Park Area', ref FR1265 dated 17th December 2004;
- 'Solvent Pit RAP Issues, Additional Llandarcy Bog Water Sampling, letter ref 7601, dated 26th January 2005;
- 'Area 1 Main Workshop, Former Degreasing Pit Investigation, ref R1278, 28th January 2005;
- URS' Remedial Action Plan (RAP) for the Llandarcy Refinery site (DR869r3). The RAP was reviewed and accepted by the Environment Agency (EA) (5th May 2000, J/CL/SITE/Llandarcy, dated 21st December 2001, EME/CL/S/V/LlandarcyRAP/TJ, dated 6th May 2005).
- 'Detailed Human Health Risk Assessment' ref 44383634 / R1364 Issue No 2 Final dated March 2006
- 'BP Llandarcy Refinery, Factual Report, Area 1 Site Investigation', ref 44382624/R1395, dated 26th May 2006;

It should be noted that not all these reports are exclusive to Area 1.

## 1.2. Project Responsibilities

The key parties involved in the remediation and their respective roles are outlined as follows:

- BP – Client.
- Atlantic Property Developments Plc / Edward Ware Homes Ltd (Original developer but now replaced by St Modwen).
- E.C Harris – appointed by BP as Project Manager under the contract, responsible for providing an interface between the Contractor companies and BP; and to monitor cost and schedule.

- URS – appointed by BP to provide environmental services for the validation of the Area 1 site and as Project Monitor of the remediation contractor. URS was also responsible for
  - Undertaking desk study appraisals for the Area 1 site
  - Undertaking site investigations to assess the site conditions
  - Undertaking human health and controlled waters risk assessment for the site
  - Preparing a remediation strategy consistent with Remedial Action Plan and the findings of the above stages
  - Progressing approval of the remediation strategy with Neath Port Talbot Borough Council
  - Monitoring that the remediation works were undertaken in accordance with the MPLWP and remediation strategy; and,
  - Undertaking validation in accordance with the remediation strategy.
- Churngold Remediation Limited (CRL) – appointed by EWH to undertake the role of 'main contractor' for the remediation works. The key responsibilities of CRL during the project can be summarised as follows:
  - Application of a mobile plant licence and preparation of a mobile plant licence working plan (MPLWP) for the asbestos remediation works;
  - Notification of the asbestos works to the HSE;
  - Undertaking remediation works at the site in accordance with the remediation specification and the site specific working plan;
  - Providing all resources necessary to undertake the required remediation works;
  - Undertaking air monitoring as required under the site specific working plan;
  - Establishment of management procedures, for surface water run off;
  - Removal of screened soils that meet the validation criteria onto the BP main site; and,
  - Disposal of all waste arisings from site to a suitably licensed facility.

Selected services were subcontracted by CRL, such as the provision of HSE licensed asbestos operatives and asbestos analysts.

The remediation contract was undertaken between 5th February 2007 and 12th October 2009.

The key responsibilities of URS during the project can be summarised as follows:

For this project, the Construction (Design and Management) Regulations 2007 (CDM) applied to both the design and construction work. URS was appointed by the client BP to undertake duties under the CDM Regulations 2007 as CDM Coordinator for the remediation works, with BP undertaking the duties under the role of Client. Edward Ware Homes (EWH) assumed the role of Principal Contractor for the remediation project.

## 1.3. Site Setting

Area 1 is located at the eastern edge of the BP Llandarcy Refinery and covers an area of approximately 5 hectares, bounded to the north by the D'Arcy Conference Centre and by the roads to Jersey Marine and Llandarcy Villages to the east and south. Junction 43 of the M4 motorway is situated approximately 150 metres to the east of the site.

The Area 1 site has a steep topographic gradient from west to east, from an elevation of 77 m above Ordnance datum (AOD) on top of the sandstone outcrops in the west, to less than 45m AOD in the east of the area, close to the road that leads to Jersey Marine.

## 1.4. Former Site Use

URS understands from BP that former refinery activities in Area 1 did not include major process plant or bulk storage of hydrocarbons. Operations in this area are believed to have included repairs and maintenance, warehousing, administration, training and car parking.

The workshop operations are understood to have included a 'hydroblast' operation to clean heat exchanger bundles, including the use of the chlorinated hydrocarbon trichloroethylene (TCE) in a pit at the rear of the building (solvent pit). The degreasing operation is understood to have been discontinued around 1970. The workshop building was latterly let by BP to EG Lewis, whose business is understood to have comprised maintenance of valves and related activities.

A small fuel filling station used for refinery vehicles was located immediately north of the site. Underground storage tanks (USTs) at this location were removed in 2002.

At the time of commencement of the remediation work the site had been demolished to slab level. A former site layout plan showing the site in ca. 1978 is provided as Figure 3.

## 1.5. Future Site Use

The site has planning approval for residential development. This largely comprises low-density housing with private gardens. The development layout was prepared by Edward Ware Homes (Robert Adams Architects, Coed Darcy Accommodation Site Plan, Drawing Number A4946/L2 Revsion G, September 27, 2006), and is provided as Figure 4.

Following the remediation works described in this report, site levels have been further altered to facilitate development. Cutting and limited filling during an earthworks phase have been undertaken on parts of the site, as have enabling works which have included the installation of retaining features to terrace the sloping site.

## 1.6. Contamination of the Site

As further discussed in Section 2.1, the following contamination issues of potentially significant risk to human health in soil and groundwater were identified for the Area 1 site:

- The presence of pieces of asbestos containing material (ACM), including pieces of gasket, rope, lagging and cemented material within both the granular and reworked drift fill material and in places the presence of dispersed asbestos fibres in fill material;
- Localised petroleum hydrocarbon contamination in soil;
- Heavy metals contamination in fill materials, including arsenic, copper, lead and zinc;
- Polycyclic Aromatic hydrocarbon (PAH) contamination in soil;
- Chlorinated hydrocarbon (trichloroethene, vinyl chloride and 1,2-Dichloroethene) contamination within groundwater.

## 1.7. Remediation Strategy

The Area 1 remediation strategy, as provided by URS on behalf of BP to Neath Port Talbot County Borough Council (NPT) on 17th June 2006, is included as Appendix A. This includes a specified list of remedial target concentrations referred to as risk based screening levels (RBSLs) and a scale of aesthetic standards.

The remediation concept for the soils in Area 1 was separated into two distinct zones (see Figure 2). These zones are:

- The Lower Car park (LCP, also referred to as Area A), and:
- The area excluding the Lower Car Park, being the remainder of Area 1 (Areas B – G, Phase II and Cordon Sanitaire; see Figure 5).

NPT agreed with the approach and the key features are summarised as follows:

1. Soils validated to the agreed remedial criteria in the area excluding the Lower Car Park and in at least the first metre below finished level in the Lower Car Park.
2. Incorporation of a warning membrane at 1m below surface level in the Lower Car Park.
3. The physical removal of the identified granular fill material from the site.
4. In situ validation of soils prior to final profiling of development site.
5. Final validation of soils within garden areas.
6. Incorporation of passive venting and gas membranes beneath properties.

7. Limited voluntary remedial works in the vicinity of the former solvent pit including an area voluntarily identified as being unavailable for development (the Solvent Exclusion Zone – see Figure 2).

8. Monitoring of historic hydrocarbon seepage from the cliff face along the northern boundary of Area 1.

9. Incorporation of land drains by the developer if contaminated groundwater was encountered.

The excavated granular fill material was sorted in a manner which permitted continuous visual inspection and manual removal of pieces of observed suspect asbestos material. Removed material was bagged for disposal at an appropriate off-site facility. The inspected material was then tested for its asbestos content. Material that passed inspection and testing was stockpiled for beneficial re-use elsewhere on the Llandarcy site, either in the former site Tip as part of an agreed restoration programme, or for commercial or recreational development. No granular fill material was re-used on Area 1, regardless of its tested quality.

## 1.8. Remediation Process

The soil remediation sequence applying to material generally remaining on site is illustrated in the flow diagram overleaf.

A 200ppm remedial criteria for asbestos content was agreed for re-use of granular fill materials removed from site. The remediation process to satisfy the 200ppm standard involved the following elements:

a) Methodical excavation of the granular fill using an excavator and hand picking of visible or suspected ACM as excavation progressed.

b) Processing of excavated materials to remove suspected ACM either by:

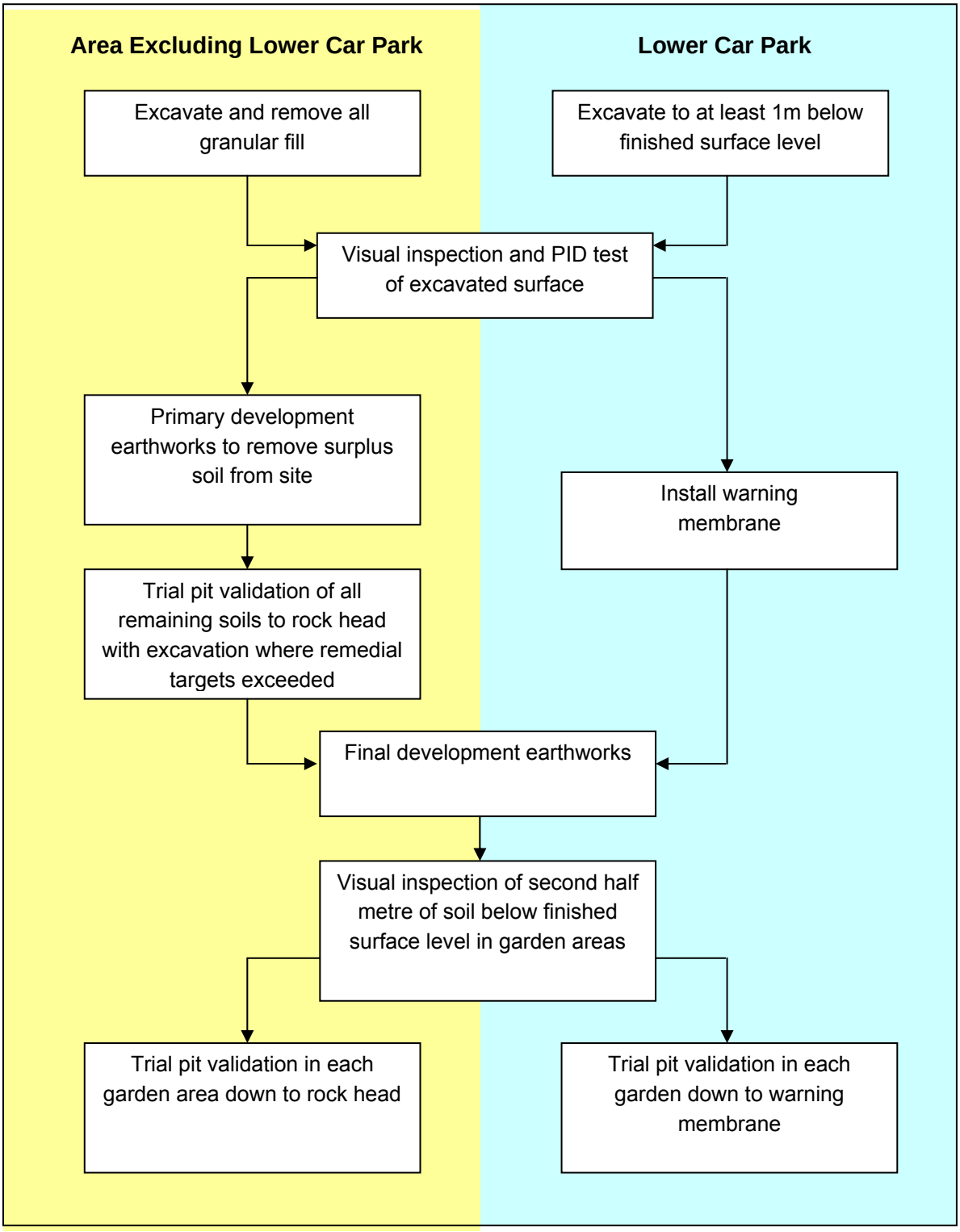
   - Manual removal of ACM as soils passed along a conveyor belt;
   - Tilling by excavator and manual removal of ACM.

   The above methods are further discussed in Section 4.4.

c) Sampling and testing of stockpiled treated material.

d) Re-treatment and re-testing of material that failed to meet the 200ppm criteria

No treated granular materials were re-used on the Area 1 site. Re-use was restricted to parts of the wider Llandarcy site outwith Area 1.


Area Excluding Lower Car Park
Lower Car Park
Excavate and remove all granular fill
Excavate to at least 1m below finished surface level
Visual inspection and PID test of excavated surface
Primary development earthworks to remove surplus soil from site
Install warning membrane
Trial pit validation of all remaining soils to rock head with excavation where remedial targets exceeded
Final development earthworks
Visual inspection of second half metre of soil below finished surface level in garden areas
Trial pit validation in each garden area down to rock head
Trial pit validation in each garden down to warning membrane

## 1.9. Validation

There were five aspects to the validation of the remediation of Area 1:

(i) Sampling and testing of materials prior to re-use outside Area 1, including treated granular fill material, by URS

(ii) Sampling and testing of the edges of excavations made to remove identified contamination below the granular layer, by URS

(iii) Grid sampling and testing of soils in-situ after the remediation works were considered complete, by URS

Further validation has been undertaken during the development phase as follows:

(iv) Sampling and testing of imported materials, by the developer

(v) Confirmatory inspection and testing of site derived soil in garden areas after final earthworks, by URS.

## 1.10. Third Party Liaison

URS was responsible for coordinating and leading a liaison process with the regulatory authorities and other third parties to negotiate and reach agreement on the remedial criteria for the site and for the implementation of the works.

The key bodies kept informed of the works were the local authority (Neath Port Talbot County Borough Council - NPT) the Environment Agency (EA), and the Health and Safety Executive (HSE).

**NPT**

Negotiations with NPT regarding the risk assessment and remedial strategy for the site were undertaken by URS on behalf of BP during the period leading up to the site remediation works. Consultation was carried out to agree remedial objectives, project target screening criteria and validation procedures.

The remediation strategy was agreed with NPT in advance of commencing the remediation works (see Appendix A). In addition, contact with NPT was made during the course of the remedial works and its agreement subsequently confirmed in regard to a number of variations to the original remediation strategy (see Section 3.6 and Appendix B):

**The Environment Agency**

URS' liaison with the EA included waste licensing discussions relating to the re-use of the treated granular material from Area 1 in the former tip on the main site.

Site Specific Working Plans for the segregation of asbestos contaminated soils and the solvent pit remediation were accepted by the EA to the holder of the Mobile Treatment Licence, CRL.

**HM Customs and Excise**

The remediation contractor, CRL, submitted an application for Landfill Tax Exemption (LTE) and undertook further liaison with HM Customs & Excise to obtain the exemption certificate.

During the Area 1 works the LTE was transferred from Grundon's Bishops Cleeve facility near Cheltenham (non-hazardous waste landfill) to Augean's Kings Cliffe site in Peterborough (hazardous waste landfill).

# 2. SITE CONDITIONS PRIOR TO REMEDIATION

Prior to the commencement of the remedial works, all above ground structures on Area 1 had been razed to slab level. The majority of Area 1 was surfaced with asphalt and to a lesser extent concrete hardstanding, as indicated on Arup Drawing 113013/CG1291 Issue P1 dated 10/05/06 (herewith as Figure 6). Trees and low-lying vegetation flanked the boundaries, particularly the southern margin of the site (Lower Car Park area) and the south western portion of Area 1 which comprised the former conservation area. Demolished structures that remained on site included the former transformer building.

The pre-remediation site levels are provided in Figure 7 (Arup Drawing 113013/CG1290 Issue P0 dated 10/05/06).

Prior to initial investigation works at the BP Llandarcy Refinery Site, URS undertook a desktop study (ref: 2048R/37491-001-411/ICL, dated 29th September 1997) to identify areas of potential environmental liability at the site. This identified that Area 1 was downgradient of, potentially significant, areas of soil and groundwater (including free product) contamination arising from former tankage areas. Part of this desktop study involved the assessment of the presence of asbestos containing materials (ACMs), based on information provided by BP and discussions with site personnel and it was established that there was potential for asbestos to be present in the soils on site.

## 2.1. Site Investigation Works

Two investigations were carried out by URS between 18th May and 31st July 1998, and 15th February and 21st May 1999. The scope of work relating to Area 1 comprised:

- Overburden and bedrock drilling and monitoring well installation. The works comprised:
  - Drilling of 4 no. 150/115mm (nominal) diameter boreholes using ODEX and DTH rotary drilling techniques, and which were completed as groundwater monitoring wells;
  - Drilling of 1 no. 150mm (nominal) diameter borehole using percussive drilling techniques and completed as a groundwater monitoring well;
  - Drilling of 6 no. 165/115mm (nominal) diameter boreholes using rotary air flush drilling techniques, and completed as groundwater monitoring wells;
- Statistically based (general coverage) and targeted soil source sampling investigation. The works comprised the excavation of 11 trial pits and were carried out through use of a number of techniques across Area 1:
  - A standard JCB-type backhoe with a 2-foot bucket, allowing the collection of the sample and the recording of geological conditions;

  - Hydraulic percussive drill rig with continuous HDPE-lined sample collection tube;
  - Hand-held window sampling rig or hand-auger;
  - Collection of the soil samples during advancement of the borehole, rather than from a separate trial pit excavation, in case the proposed soil sample locations were coincident with specific borehole locations.

- Two groundwater sampling events for all monitoring wells.

The name of all the locations investigated and the boreholes drilled during the investigations during 1998 and 1999 start with the letters MS (standing for Main Site). All the locations are presented on Figure 8.

A further site investigation was carried out by URS in Area 1 between the 3rd February and 3rd March 2003. The scope of work undertaken comprised:

- Investigation of potential soil and groundwater contamination at the site, by undertaking a programme of intrusive investigation works which included:
  - Drilling of 13 no. 115/100mm (nominal) diameter boreholes using ODEX and DTH rotary drilling techniques and completed as groundwater monitoring wells;
  - Drilling of 6 no. 100mm (nominal) diameter boreholes using percussive drilling and DTH rotary drilling techniques and completed as groundwater monitoring wells;
  - Excavation of 8 no. trial pits using a JCB-type excavator;
  - Excavation of a further 12 no. trial pits at locations of above mentioned boreholes (where access and/or permit granted);
  - Sampling and laboratory analysis of soil samples from all of the above borings;
  - Monitoring, sampling and analysis of groundwater within newly installed boreholes; and
  - Levelling of boreholes to a common datum to facilitate assessment of groundwater gradients.
- Obtaining data on the aesthetic quality of the soil and groundwater at each of the locations investigated, and, where possible, to assess the depth to the base of contamination observed.

Groundwater monitoring well and soil samples locations are presented as Figure 8. The name of all the locations investigated and the boreholes drilled during the investigation of February 2003 start with the characters P1 (standing for Phase 1).

During the initial site investigation work conducted by URS in 1998 and 1999 a total of 8 trial pits were excavated in the general area of the former BP car park. During this work no visible signs of ACMs were noted.

During the subsequent investigation in 2003 evidence of potential ACM was observed by the field engineer at four locations; P1AF003, P1AF009, P1AF011 and P1BH030.

Following receipt of these results, BP subsequently employed Anchem Analytical Laboratories to undertake some further investigation work (6th June 2003) to assess the potential distribution of asbestos around the locations identified by URS. Three locations were excavated around location P1AF003, each approximately 3m from the borehole and a further three locations were also excavated around location P1BH030, again each approximately 3m from the borehole. Several samples of suspicious ACMs were taken, together with one soil sample. Laboratory results indicated the presence of asbestos cement and insulation materials, containing chrysotile (white), amosite (brown) and crocidolite (blue) asbestos. The suspicious ceramic and refractory materials were reported not to contain asbestos, however free fibres were observed in the adhering soil and in the single soil sample taken for analysis.

BP then commissioned Anchem to extend the work (11th July 2003) to investigate additional areas. Five pits were excavated across Area 1 to a maximum depth of 1m. Although little visual evidence of asbestos was observed in the field, the laboratory results from soil samples taken within the ashy layer present beneath the tarmac hardstanding was reported to contain trace quantities of amosite asbestos in two of the five samples taken, and chrysotile asbestos in one sample.

Anchem undertook a final piece of work for BP (July 30th 2003), in which two excavations, area of nominally five metres square, were inspected and sampled for analysis. URS was invited to observe this piece of work. Samples were taken from the surface ash layer and from suspicious materials encountered. Laboratory results indicated the presence asbestos in 7 of 13 samples analysed in the form of free asbestos fibres within some of the ashy soil samples taken, the presence of asbestos containing insulating board, gasket material, cement sheeting and insulation material.

BP informed URS of possible historic asbestos stripping operations associated with a pipe lay-down area just north of the car park, which may have contributed to the asbestos observed. Additional information subsequently supplied by BP suggested that demolition waste from a former power station may have been deposited in this area to level the ground for the car park, possibly during the 1940's-1950's. This rubble may have contained asbestos.

URS undertook further asbestos delineation investigation woks comprising:

- Intrusive works comprising excavation of trial pits on an approximate 20m regular grid
- Soil inspection and sampling at each investigation location;

- Analysis of soil samples for the presence and identification of asbestos containing materials (ACM) and free fibres using polarised light microscopy with refractive index measurement by dispersion staining; and
- Additional analysis of a sub-set of samples for quantitative analysis of asbestos fibres in soil.

## 2.2. Geology, Hydrogeology and Hydrology

**Geology**

From the investigations undertaken the geology at the commencement of this project was understood to comprise in simplified terms a widespread typically 0.1- 0.5m thickness of ashy fill over silty and clayey glacial drift over sandstone bedrock at around 0.5-2m depth. In some locations the ash fill was overlain by further granular fill and, particularly in the Lower Car Park area glacial drift has been reworked as fill. Localised groundwater has been identified in deeper areas of drift, however, the water table is believed to lie generally within bedrock within this area.

**Hydrogeology**

The Pennant Measures underlying the site are considered to have a low permeability and are classified as a 'minor aquifer' by the Environment Agency. Regional groundwater flow in the area is expected to be in an easterly direction towards the River Neath.

Shallow, perched, groundwater may occur locally within superficial and fill materials beneath the site. Groundwater flow direction within these materials may be controlled by a number of factors, including variations in the grain size and composition of the materials.

**Hydrology**

The nearest surface water bodies to the site are the Tennant Canal and River Neath, both situated approximately 1km to the east.

There is a minor surface water course which rises in Llandarcy Bog, to the south of Area 1, and flows east outside of the Area 1 boundary.

## 2.3. Identified Contamination

With reference to the investigation reports noted in Section 1.1, the following contamination was identified at the site prior to remediation.

### 2.3.1. Asbestos in Soil

On the basis of this investigation work, the primary remediation driver for Area 1 was considered to be asbestos contamination. As illustrated in the asbestos delineation report, a 'trace' content of asbestos fibres was identified in the granular fill on a widespread but irregular basis across much of the development area. Laboratory

analyses suggested that where detected, asbestos fibres constituted less than 10ppm in soil. This compared with URS' proposed RBSL for dispersed asbestos fibres in soil in residential areas of 200ppm. Pieces of asbestos containing material were also found in that material but less frequently. On the basis of the available data obtained on an approximate 20m-25m interval, it was considered likely therefore that most of the granular material would be acceptable in a residential context from the viewpoint of dispersed asbestos fibres. However, given the proposed residential nature of the development and the undesirability of visible pieces of asbestos materials being uncovered during or after development, a conservative strategy was adopted whereby granular fill would generally be excavated and removed from Area 1.

In the Lower Car Park, it was inferred that a layer of drift material reworked as fill had been placed to raise the ground level. This fill yielded some samples containing pieces of asbestos material but at a lower frequency than the more widespread granular fill. This was the basis of the different remediation approach for the Lower Car Park and the remainder of Area 1.

### 2.3.2. Contamination Other than Asbestos in Soil

The only contamination issues of concern identified in cohesive soil (i.e. which would remain in-situ after the granular fill was stripped) were TPH contamination at one location and PAHs at two locations. The remediation specification included removal of these materials

### 2.3.3. Residual Solvent Contamination

Solvent contamination (principally trichloroethylene, with assumed degradation products dichloroethylene and vinyl chloride) was identified within the area of the former solvent pit (location on Figure 5). A programme of remedial works was subsequently implemented to reduce the solvent mass in this area, as discussed in Section 4.12.3.

### 2.3.4. Cliff Seepage

Historically, hydrocarbon seepage or sheens have been observed from the western end of the cliff face at the northern edge of the development area. This seepage is presumed to have been associated with historical operational losses of hydrocarbon from process plant and storage tanks which were located on the terrace above the cliff to the west; this plant was demolished in 2001-2002. Above the central and eastern section of the cliff is a narrow peninsular of elevated bedrock, beyond which the topography falls away again to the north; operational losses on this peninsular are thought much less likely as there was virtually no infrastructure located there and therefore hydrocarbon seepage from the main (north) face of the cliff is unlikely.

Observations of seepage have diminished with time, which is to be expected as residual hydrocarbon in the ground would be expected to have diminishing mobility without a continuing source.

It is thought unlikely that measures will be required to manage hydrocarbon seepage in order to facilitate development of Area 1. The cliff face was cleaned by high pressure water washing on 29th August 2008 and through the course of the remediation works was subject to regular inspection. URS' report presenting the findings of the cliff-face watching brief undertaken during the remediation works, ref 44382729/BRLT00003/MC/SC dated 15 November 2007, is included as Appendix C.

In the event that management of seepage is thought necessary, or desirable on a precautionary basis, the development layout reserves sufficient space such, for example, layered geotextiles, could be affixed to the western rockwall to both screen seepage for aesthetic purposes and convey it to a collection drain.

### 2.3.5. Groundwater Drainage

Limited contamination was detected in groundwater beneath Area 1, with no exceedances of residential RBSLs observed, except in groundwater in the bedrock in the area of the former solvent pit. An area was identified around the solvent pit where development would be excluded, this being referred to as the Solvent Exclusion Zone. Its footprint is provided on Figure 2.

# 3. REMEDIATION STRATEGY

## 3.1. Planning Condition

The remediation works were carried out in the context of the site's proposed redevelopment for residential use under NPT planning permission ref P/02/143 dated 9th September 2003. Details of the development were varied by submission of application P/2005/1284 on 8th August 2005. The requirements of the planning approval directly affecting remediation are set out in Condition 8 as follows:

> *Prior to the commencement of work on site, a detailed scheme to deal with any contamination on the site shall be submitted to and approved by the Local Planning Authority. This scheme shall be a staged approach and will first include the submission of a Site Investigation and Risk Assessment. If at this stage of the process the Local Planning Authority notify the applicant in writing that contamination will cause an unacceptable risk to the site users or the environment, a mediation strategy shall be provided to be submitted to and approved by the Local Planning Authority. Prior to any occupation of the development a validation report and results prepared by a suitably qualified person, shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall be implemented in accordance with the approved details. Reason In the interest of public safety.*

On behalf of BP, URS had previously submitted to NPT and the EA site investigation and risk assessment reports which are intended to satisfy Condition 8. URS' memorandum to NPT, dated 17th July 2006 (see Appendix A), sets out BP's proposal with regard to the remediation strategy, which was implemented through contracts with EWH (remediation, sub-contracted to Churngold Remediation Ltd) and URS (monitoring and validation).

## 3.2. Basis for Strategy

### 3.2.1. Risks to Human Health

Health protective remediation criteria (risk based screening levels (RBSLs)) have been developed by URS consistent with UK Government guidance to Part IIA of the Environmental Protection Act 1990. These criteria and their basis are set out in the risk assessment reports referenced above. Comparison of these criteria with the contaminant dataset for this area of the site prior to its remediation identified the following contamination issues of potentially significant risk to human health in soil:

- The presence of pieces of asbestos containing materials, including pieces of gasket, rope, lagging and cemented material within both the granular and reworked drift fill material and in places the presence of dispersed asbestos fibres in fill material. A total of 184 samples were collected and analysed for asbestos content during the asbestos investigation and workshop investigations undertaken in 2004/5. Of these, 27 were found to contain pieces of asbestos material while a further 17 were

identified as containing 'trace' amounts of asbestos. Blue, brown and white asbestos was identified at locations within the former BP car park. During earlier work undertaken by URS in February 2003, a further 3 samples were identified as containing pieces of asbestos. Anchem Laboratories also undertook some work in this area of the site in June and July 2003. Assessment of the data set collected indicates a further 10 locations where pieces of asbestos were identified and 8 where trace asbestos on adhering soil was identified. Of the pieces of asbestos detected, 5 were on the ground surface, including pieces of asbestos tile, vinyl tile and a gasket. This material has all been removed during the remediation works.

- Localised petroleum hydrocarbon contamination of soil. Of 55 soil samples analysed for diesel range organics (DRO), 5 exceeded the shallow soil TPH RBSL of 1,717mg/kg. Of these, 4 samples were in fill material. This material has all been removed during the remediation works.

- A total of 40 samples were recovered and analysed to investigate the metals content of the shallow soil; 27 of these samples were from fill material. Of those samples analysed from fill material, 18 exceeded one or other of the proposed metals RBSLs, in particular those for arsenic, copper, lead and zinc. This material has all been removed during the remediation works.

- A total of 60 soil samples were analysed for polyaromatic hydrocarbons (PAHs), of which 11 were reported to contain summed concentrations of the compounds analysed and expressed in terms of toxicity equivalence to benzo(a)pyrene (BaP) in excess of the proposed RBSL for BaP. Those samples exceeding the criteria were either from the fill material or the interface between the fill and underlying cohesive soils. This material has all been removed during the remediation works.

A total of 55 soil samples were analysed for selected volatile organic compounds (VOCs) based on the desk top study of the site and results of earlier work. This suite comprised mono-aromatic hydrocarbons (likely to be associated with petroleum product) and dichloromethane and methylene chloride (two chlorinated hydrocarbons which had been utilised in the main process area (located north of Area 1) and which have been identified at other locations in the refinery).

Methylene chloride was detected in soil samples at 6 locations at concentrations above the method detection limit of 0.005mg/kg All of these detected concentrations are almost 3 orders of magnitude lower than the RBSL of 5mg/kg.

In addition to the site-specific VOC suite analysed for in 55 soil samples, a further 10 soil samples were subject to a standard 'full' VOC analysis. These samples were predominantly associated with the investigation work undertaken in the solvent pit area. None of these samples were reported to have any VOC analyte at a concentration above the method detection limit of 0.005mg/kg.

### 3.2.2. Risks to controlled waters

Comparison of the RBSLs with the contaminant dataset for groundwater for this area of the site identified the following issues of potentially significant risk to human health:

- Trichloroethene, 1 location at 3 depth intervals (WSB007da/d2 and d3), maximum concentration of 5.4mg/l versus RBSL of 2.6mg/l
- Vinyl chloride, 5 locations (WSB006, 007, 008, 009 and 013), maximum concentration of 4.9mg/l versus RBSL of 0.06mg/l
- 1,2-Dichloroethene, 2 locations (WSB006 and 007), maximum concentration of 27.4mg/l versus RBSL of 15mg/l

No free phase hydrocarbon was detected using an air-oil-water interface probe in monitoring wells during the most recent gauging (spanning September 2003 to March 2005 depending on well location). Previously, free phase hydrocarbon in excess of 2mm was detected at 4 locations in Area 1 (MSMW060, MSMW061, P1AF007 and P1BH011), all within the bedrock unit. That free hydrocarbon was no longer observed may be accounted for by the expected general reduction in mobility with the passage of time, as there is no known plausible continuing hydrocarbon source in this part of the site.

A controlled waters and environmental risk assessment has been developed previously for the refinery site and a programme of remediation actions (the RAP) agreed with the the EA and Countryside Council for Wales (CCW) on that basis. No requirement for remedial works to address controlled waters or environmental risks was identified within Area 1.

As the presence of solvent contamination associated with the workshop was identified subsequent to the RAP, a re-assessment of the risks to Llandarcy Bog was made, which concluded that the contamination observed was unlikely to be a significant risk. This is discussed further in Section 3.5, below.

The remedial works proposed to facilitate residential development are expected to reduce further, such risk as there may be to controlled waters and the wider environment by the reduction of contaminant mass.

### 3.2.3. Preventative Measures

In addition to the removal of all granular fill from site, a number of further precautionary preventative measures will be incorporated into the final development including:

- A vapour resistant membrane and passive venting layer will be incorporated by the developer into each house or other building likely to be routinely occupied by people. This measure is intended to address any risk to health arising from vapour ingress to buildings from contamination remaining in-situ, including volatile contamination in groundwater. In practice, no contamination of groundwater has

been detected in excess of the residential RBSLs except in the Solvent Exclusion Zone, where construction is precluded;

- In the event that site development results in a plausible risk that future residents may come into contact with groundwater from the bedrock, the Developer is required to install land drains at a minimum depth of 1m (below final ground level) and a maximum depth of 1.5m or rockhead, whichever is shallower. The purpose of such drainage would be to control ground water level as a precautionary measure in the event that contaminated water remains within the rock. Provision would be made for discharge of any water arising, appropriate to its quality;

- Restrictive covenants will be required by BP to be incorporated into the house sale agreements such that the integrity of vapour membranes are to be maintained and that these are incorporated into extensions and new buildings likely to be occupied by people. Installation of groundwater wells will be precluded. In the Lower Car Park covenants will be required such that the integrity of the capping layer is maintained.

## 3.3. Purpose of the Strategy

BP's proposed remediation strategy, as provided by URS to NPT on 17th July 2006, is included as Appendix A. The strategy was developed with the objective that the development site will be suitable for residential use with respect to ground contamination and that this should also be the perception of future occupants. NPT's acceptance of the strategy is also included in Appendix A (ref. Approval of Details document dated 1/09/2006).

It was intended that following remediation, soil materials would be of better quality than the remedial criteria generally in the area excluding the Lower Car Park (Figure 2) and in at least the first metre below finished level in the Lower Car Park terminating in a warning membrane. The level of confidence that this has been achieved is determined by the validation sampling strategy adopted.

The physical removal of the identified granular fill material from the site was an intrinsically conservative approach which removed reliance on the quality of treatment or validation of this material as far as Area 1 is concerned. This key component of the remediation scheme had the effect of substantially addressing the issues of both asbestos and metals content in site soils to a high degree of confidence. Nonetheless, the content of those materials in the remaining site soils has been validated.

Risk based screening levels (RBSLs) were developed by URS and agreed with NPT as providing health and environmentally protective remediation targets.

The sequencing of the soil remediation relative to construction means that soil remaining on site following remediation has been validated in-situ, prior to final profiling of the site. The final location of soil within Area 1 following construction could therefore be different to that directly following validation. As a further precautionary measure, once the site is profiled and construction advanced to the point that property boundaries are known with

confidence, the soil which will form the second half metre below finished level in garden areas is turned over mechanically or placed in a controlled manner and subject to visual inspection by URS. Final validation samples are taken of that layer down to the warning membrane in the Lower Car Park and down to rock head in the area excluding the Lower Car Park. This process has been completed in the areas available for final inspection as of November 2009 (See Section 5.5)

## 3.4. Remediation Concept

Given the proposed residential nature of the development and the undesirability of visible pieces of asbestos materials being uncovered during or after development, a conservative strategy was adopted whereby granular fill was generally excavated and removed from Area 1.

The pre-remediation data provided a good basis for minimising disposal and the consumption of landfill space in favour of the re-use of much of the granular fill as an engineering material in a less sensitive location. The granular fill material was therefore excavated and sorted in a manner which enabled continuous visual inspection and manual removal of pieces of observed asbestos material. Removed material was bagged for disposal at an appropriate off-site facility whilst the inspected material was tested for its asbestos content. Material that has passed inspection and testing can be beneficially re-used elsewhere on the Llandarcy site, either in the former site Tip as part of an agreed restoration programme, or for commercial or recreational development. In any event, re-use was to be subject to agreement with NPT regarding the suitability of the material for the proposed re-use and with the EA regarding both suitability and waste management issues.

Site investigation data suggested that asbestos materials were less frequent in the cohesive fill in the Lower Car Park than the more widespread granular fill. All material known and suspected not to meet the validation criteria during any excavation works in the Lower Car Park was segregated and the quality of the balance of the material validated. Surplus material meeting the validation criteria was removed from Area 1, and, if validated as meeting the validation criteria, can be reused elsewhere on the wider Llandarcy site, again subject to appropriate agreement with NPT and EA.

The remediation concept for the soils in Area 1 was therefore separated into two distinct zones (see Figures 2 and 5). These zones are:

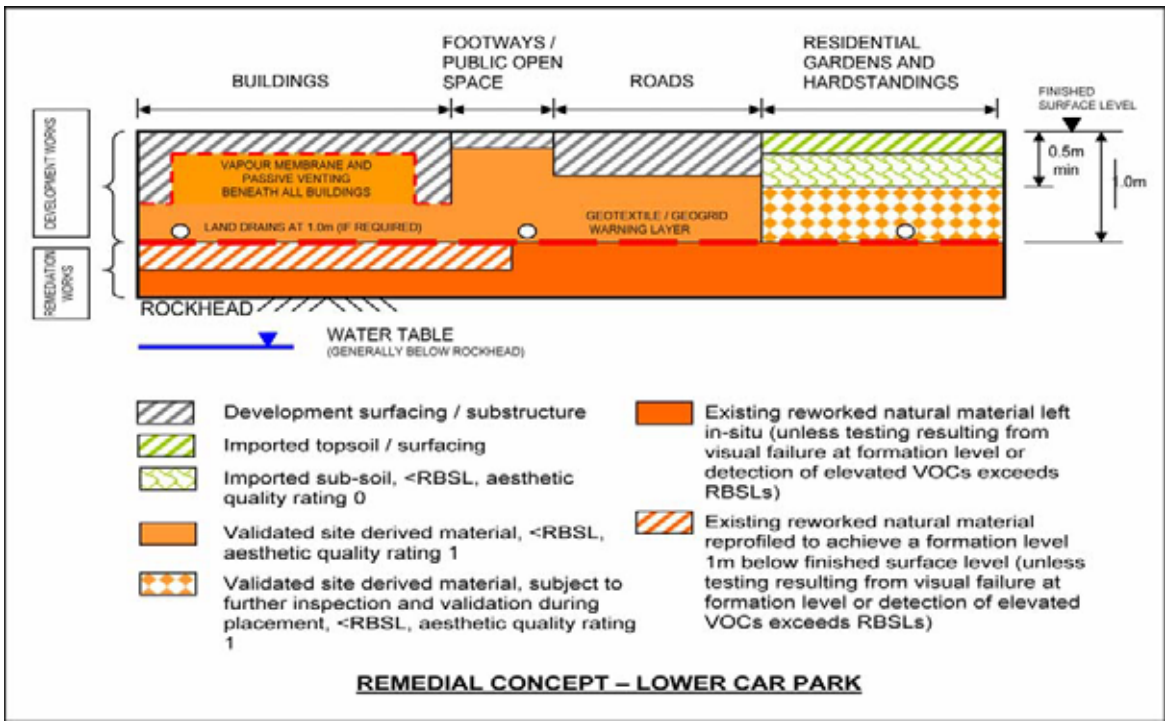
- The Lower Car Park (Area A), and:
- The Area Excluding the Lower Car Park, being the remainder of Area 1 (Areas B–G, Phase II and Cordon Sanitaire).

The Cordon Sanitaire was an area outside of the development site voluntarily established as a buffer zone between the Area 1 development and potential future development of te adjacent Llandarcy site. The intention was to remediate this consistent with the requirements of the Area 1 development to reduce the possibility of any future remediation works being required immediately adjacent to residential properties. This

potential interface is only present at the north-west area of te site, all other boundaries being physically segregated by, for example, public highways, existing developed land, the cliff face etc.

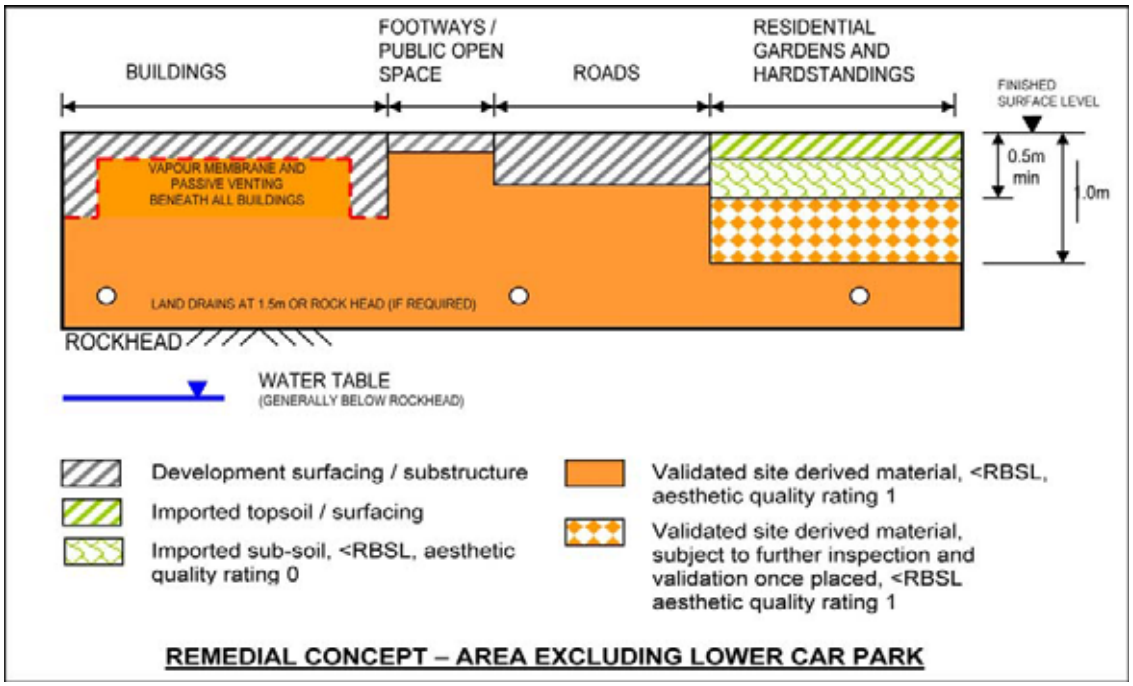
### 3.4.1. Lower Car Park

In the Lower Car Park, the strategy was to excavate to a depth of at least 1m below proposed finished surface level in a controlled, methodical manner. In addition, if volatile contamination 'hotpots' were encountered these would be excavated and disposed off site. The area was then to be covered with a continuous cap of not less than 1m thickness of material across the Lower Car Park area. The cap was placed over a continuous suitable geotextile or geogrid (minimum 60 year design life) that is intended to act as a warning layer selected to permit the passage of water but resist penetration by light, manual excavation.



### 3.4.2. Area Excluding Lower Car Park

In the Area Excluding the Lower Car Park the strategy was that, following remediation, soil material would be of better quality than the remedial criteria. The level of confidence that this has been achieved is determined by the validation sampling strategy.




## 3.5. Solvent Reduction Works

Intrusive site investigation prior to the Area 1 works identified a limited dissolved chlorinated solvent plume believed to be associated with a former degreasing pit situated in the workshops and stores building. Groundwater sample results from boreholes adjacent to the nearest potential surface water receptor were below detection limits, demonstrating neither contamination of nor theoretical risk to controlled waters.

In the areas where such contamination was detected, groundwater is in the bedrock. On the basis of the available data, there would be an implied risk to future site occupants from groundwater contamination in wells WSB006, WSB007, WSB008, WSB009 and WSB013 under a residential scenario.

While this potential risk could be addressed by the vapour membranes and passive venting which is required to be incorporated into all properties, as a precautionary measure, construction has been precluded over the area in which contamination was detected in excess of RBSLs (Solvent Exclusion Zone, Figure 2). It is proposed that the solvent exclusion zone will be finished as public open space, using site derived and imported soils which will be subject to validation as set out further below. This open space will be underlain with low permeability soil and designed with a slight convex

landform located over the former pit as a further precaution, with the objective of minimising infiltration of recharge to the pit area.

The RAP for the Llandarcy site as a whole has been accepted by the Environment Agency and forms the basis of an ongoing programme of remedial works being undertaken by BP to provide protection to the sensitive receptors that surround the site. One of the fundamental bases of the RAP is that the water beneath the site should be considered a pathway to surrounding controlled waters and environmental receptors, rather than a receptor itself. In the case of Area 1, the most plausible controlled water receptor for contamination emanating from the solvent pit is the Llandarcy Bog.

Given the passage of more than 30 years since solvent operations were reportedly discontinued, URS would expect that migration of chlorinated hydrocarbon from the source area will have reached static equilibrium or be declining. This analysis is supported by consideration of the limited extent of contamination and its speciation, which suggests active decay. As construction is precluded in the area in which chlorinated hydrocarbons have been detected in excess of RBSLs and as groundwater sampling has resulted in no detection of chlorinated solvents in wells on the margin of the Llandarcy Bog, it has been concluded that there is not likely to be significant risk from the solvent pit contamination. It was not therefore considered necessary on the basis of the risk assessment to undertake remediation either to facilitate development or to protect controlled waters.

This assessment of risk notwithstanding, and to satisfy their internal objectives ahead of the long-term redevelopment of the site, BP decided to undertake limited voluntary remedial works in the vicinity of the solvent pit. The works undertaken are described further in Section 4.12.3.

No specific remedial targets were proposed as there was no risk-basis for the works, but there was intent to provide future betterment of groundwater quality in the area by reducing the source mass and therefore substantially accelerate the future process of natural attenuation.

## 3.6. Remediation Criteria

Health protective remediation criteria (risk based screening levels (RBSLs)) were developed by URS consistent with UK Government guidance. These criteria and their basis are set out in the following reports:

- 'Quantitative Human Health Risk Assessment', ref DR1145R, dated 13th January 2004;
- Addendum to Detailed Human Health Risk Assessment (Screening Criteria for Asbestos Contaminated Soil, Llandarcy Refinery Development), DR1145R dated 3rd February 2004;

- Addendum to Detailed Human Health Risk Assessment (Methodology for the Assessment of Additional Compounds for Residential, Commercial and Recreational Development), DR1272 dated 5th May 2005;
- Addendum to Detailed Human Health Risk Assessment (selected non-threshold compounds – commercial end use), DR1215 dated 7th May 2004;
- Addendum to Detailed Human Health Risk Assessment (selected non-threshold compounds – residential end use), DR1242 dated 2nd August 2004.

During the course of the remediation works, a number of amendments or deviations from the strategy were agreed as follows:

- February 2008 – Reduction in the frequency of chemical testing of crushed rock from 1 in 25$m^3$ to 1 in 200$m^3$ following the greater re-use of crushed rock than anticipated and its observed low hydrocarbon content. (URS letter dated 7 February 2008 and NPT response dated 21/02/2008 refer).
- February 2008 – Reduction in the frequency of chemical testing for imported fill from 1 per 500$m^3$ for quarried material to 1 sample per quarry source, each sample composite of five sub-samples. (URS letter dated 7 February 2008 and NPT response dated 21/02/2008 refer).
- April 2008 – due to the high natural background levels of zinc encountered in rock and soils, the original RBSL for zinc of 200mg/kg was agreed to be raised to 3,280mg/kg. (URS letter dated 11 April 2008 and NPT response dated 09/05/2008 refer).
- February 2009 – soil in the vicinity of 30 soil samples with marginal copper, lead, nickel and benzo(a)pyrene exceedances was proposed to NTP to remain in-situ, which was accepted. (URS letter dated 25 February 2009 and NPT response dated 12/03/2009 refer).
- September 2009 - soil in the vicinity of13 samples with marginal arsenic, copper, lead, mercury, nickel and benzo(a)pyrene exceedances was proposed to NTP to remain in-situ, which was accepted. (URS letter dated 8 September 2009 and NPT response dated 22/09/2009).

Associated correspondence is included in Appendix B.

# 4. REMEDIATION WORKS

## 4.1. Introduction

This section explains the remedial works undertaken at the site, beginning with an explanation of the manner in which the site was subdivided into separate portions.

The remediation methods deployed to remove ACM from the granular fill are discussed in Section 4.4 whilst the works undertaken in each separate portion of Area 1 are summarised in Sections 4.5 through 4.16. A selection of photographs that illustrate the works is referenced in the following subsections and presented in the Plates section before the Appendices of this report. Figure 9 shows the location and direction from which each photograph was taken.

## 4.2. Area 1 Zoning

Area 1 was divided by the contractor into the following working areas:

a) Lower Car Park (LCP), also known as Area A.

b) Area excluding the Lower Car Park. Subdivided into:

Phase 1:

- Areas B to G. This division was made by the contractor simply to allow easier reference to different parts of the site when sequencing the works;
- Cordon Sanitaire – located to the north of Area 1, this parcel of land was, strictly speaking, an extension of Area 1 boundary and served to act as a buffer zone between the Llandarcy main site and the Area 1 redevelopment area. The same specification applied as per Area 1.

Phase 2:

- A 30m corridor centred on an existing high pressure gas main and pressure reduction station in which excavation was not be permitted prior to the decommissioning and removal of those features. This corridor formed the physical divide between Phase 1 and Phase 2.
- Former conservation area occupying the south western margin of Area 1.

The above remediation working areas are presented on Figure 5.

## 4.3. Site Clearance and Preliminary Works

The site layout prior to the commencement of remedial works is presented in Figure 6 and 7. Following mobilisation to site, the remediation contractor stripped the majority of the remaining trees and vegetation from Area 1 (excluding the former conservation area) and transferred them to the Top Terrace.

Prior to the excavation of granular materials containing ACM, the contractor installed surface water management silt traps. Whilst the excavation process and remediation works were undertaken with a view to limit fibre release, the silt traps were installed on the downgradient margin of the area being worked to collect fibres that could potentially be suspended in surface water running off the site.

Removal of the surface cover of asphalt and concrete (shown in Plate 1) commenced soon after mobilisation. This was undertaken on an area-by-area basis (starting in Area C) where the excavation of contaminated materials was to be carried out for subsequent processing. Much of the hardstanding from all areas was removed prior to excavation of the granular materials.

## 4.4. Removal of Asbestos from the Granular Fill

The treatment of the granular fill intended to satisfy the 200ppm remedial criteria for asbestos content involved the following elements:

a) Dosing with surfactant solution and handpicking of ACM observed in those areas of site that were not surfaced with hardstanding at the commencement of the works and immediately underlying the asphalt/ concrete hardstanding in those that were.

b) Methodical excavation of the granular fill using an excavator in manageable horizons of up to ca. 300mm thick and hand picking of visible or suspected ACM (shown in Plate 2).

c) Excavated granular materials were then processed using the following methods:

   - Manual removal of suspected ACM as soils passed along a conveyor belt; (shown in Plates 3 and 4)

   - Tilling by excavator and manual removal.

   The above methods are further discussed in the following subsections.

d) Stockpiles of treated material were placed in a designated laydown area for validation by URS (Plate 5). Stockpiles that met the validation criteria were transferred from Area 1 to the Top Terrace of the main site (Plate 6). Stockpiles failing to meet the criteria were either retreated until the criteria were met or disposed of off-site to a suitably licensed waste management facility. Treated granular materials (including those that met the validation criteria) were not re-used on Area 1.

Where visual or olfactory indicators of contamination suggested that organic contaminant concentrations were potentially in excess of the site screening criteria, such materials were either temporarily segregated (where the volume was small) or, where larger, left in-situ until the extent was understood and a strategy for their removal devised. Similarly, where the incidence and nature of ACM in the granular materials were considered such that the materials would be less amenable to treatment than the general nature of the fill,

these materials were left in-situ until an agreed approach to their remediation (or off-site disposal) had been determined.

The sequencing of the works involved the methodical removal of granular fill firstly from Area C, followed by Areas A, B, D, E, F, Cordon Sanitaire and Area G. Whilst the initial approach was to complete each area prior to commencement of the next, this was not practical in some instances. The Phase 2 remediation works (former gas main and conservation areas) were undertaken between the remediation of the different portions of Area G.

The two treatment methods deployed by CRL are described in the following subsections.

### 4.4.1. Picking Belt

The remediation contractor's treatment approach at the outset of the Area 1 remediation works involved the use a picking belt with four asbestos operatives positioned alongside to manually remove asbestos. The picking belt method was selected by the contractor based on its successful application at previous sites.

Excavated granular materials loaded directly into a dumper from the dig zone were transferred to a loading area adjacent to the belt (located in Area G). An excavator would load the automated belt with material where operatives, on a covered, raised gantry, would rake the material and pick ACM / suspected ACM from the belt. The material exiting the belt would then be dropped to form a stockpile that was checked by licensed asbestos operatives. The stockpile would then be transferred to a laydown area along the northern margin of Area G, adjacent to the cliff face, where it would be subject to validation sampling by URS. Stockpiles that met the validation criteria were transferred from Area 1 to the Top Terrace whilst those failing were transferred to the belt for reprocessing until the remediation criteria were achieved.

The picking belt was successful where a relatively low incidence of ACM was encountered and where this was predominantly in a bonded form (i.e. cement, gaskets) within a relatively homogeneous matrix. However, as much of the material passing through the belt was often heterogeneous (containing varying proportions of sand, gravel and more cohesive materials) and the asbestos content and type often highly variable (including the presence of non-bonded ACM such as lagging), the belt was of limited success. A vibrating screen was added to even the loading of material on the belt although this, together with attempts to slow the belt and alter the number of personnel, was of limited success at achieving the RBSL. CRL subsequently altered its processing approach to tilling and picking.

### 4.4.2. Tilling

Following the removal of the picking belt and vibrating screen from site after the treatment of 60No. stockpiles, CRL's change in approach to the treatment process involved the following steps:

- Excavated granular materials were placed in manageable stockpiles, along which an excavator could safely track.

- Starting from one end of the stockpile, soil would be tilled or sprinkled from the excavator bucket to form a new stockpile whereupon attending asbestos operatives would pick the outer surface of the stockpile.
- The excavator would slowly move along the length of the stockpile, incrementally adding material to the new stockpile.

The above approach proved more successful at meeting the validation criteria as a larger surface area of material could be viewed and the speed of the operation readily varied as required, based upon the nature of the material and the type and incident of asbestos encountered.

## 4.5. Hot Spot Removal

Prior to the commencement of the remedial works a number of 'hotspots' were identified within cohesive materials that underlay the granular materials. These hotspots were detected during the investigation of Area 1 (refer to Section 2.1) and found to exceed the chemical criteria specified in the validation suite.

To prevent the potential mixing of these hotspots with surrounding cohesive materials during the earthworks or development phase of the works, hotspots were removed following the stripping of the granular fill materials. Hotspot materials were transferred to the Top Terrace for re-use, treatment or disposal by others.

## 4.6. Area A – Lower Car Park

### 4.6.1. Overview

As anticipated, much of the Lower Car Park (LCP) materials comprised relatively cohesive material. Red and black granular horizons (shown on Plate 7), some laterally extensive, were also encountered and were found to contain a variety of different types of ACM (including cement, rope, gaskets, blankets and lagging) of varying incidences.

Granular materials were picked at the excavation face and also when placed as temporary stockpiles in the LCP. Further ACM removal took place at the temporary laydown in Area G depending upon the validation results.

Whilst the incidence of asbestos in the more cohesive horizons was typically much lower than the granular, these materials were tilled and identified ACM was removed prior to stockpile transfer to the Top Terrace where validation subsequently took place.

Bedrock was found to be relatively shallow within the LCP, particularly along the northern and northwestern portions (Plate 8). As such, excavation in these areas ceased at the level of competent bedrock which was prior to reaching 1m below the depth of Finished Surface Levels (FSL).

### 4.6.2. Drum

During excavation of materials near the top of the LCP bank (southern margin), a blue steel drum was encountered. The unmarked drum appeared intact, was lying on the ground surface and was deep in undergrowth. No leakage was evident. The capacity of the drum was 200 litres and it had a liquid content of around 50 litres. When sampled the liquid was red in colour with a hydrocarbon odour. Whole oil laboratory analysis suggested the content was fuel oil and BP subsequently disposed of it through its on-site oil recovery system.

## 4.7. Area B

### 4.7.1. Overview

Area B comprised a parcel of land on the northeastern margin of Area 1. Whilst ash was present across this portion of site, the incidence of asbestos was generally low in what was typically a thin granular fill.

In addition to the anticipated asbestos contamination within the granular fill, PCB contamination associated with a former transformer area was identified along with a vegetated area in which Japanese knotweed was observed. The manner in which these areas were dealt with is discussed below.

### 4.7.2. Former Transformer Area

Prior to commencement of the remedial works the former brick transformer house had been demolished and the arising brick and concrete together with a small amount of residual infrastructure left stockpiled on and around the structures former footprint. The concrete hardstanding was also still in place.

A range of materials and soils were subsequently collected for Polychlorinated Biphenyl (PCB) analysis. PCB concentrations above the method detection limit (0.05 mg/kg) were reported in 4 of 19 samples analysed, ranging from 0.38mg/kg to 24,000mg/kg. The two highest reported PCB concentrations (24,000mg/kg and 3mg/kg) were from samples of black bituminous material that were plastic in nature and collected from within the transformer housing (Plate 9). PCBs were not detected above the method detection limit in four additional bituminous looking samples that were brittle. The results are presented in Table 1.

Remedial works were therefore considered necessary in view of the presence of elevated PCB concentrations within particular made ground constituents.

All demolition arisings present on the footprint and within the vicinity of the former transformer area together with the underlying granular fill were carefully excavated across a plan area of 25m by 25m (centred on the transformer) and removed from the Area 1 site (Plate 10). Testing of both the building materials and underlying soils were subsequently undertaken to assess the suitability of the materials for re-use on the BP main site. The excavation was terminated upon encountering natural clay, in which no made ground artefacts were observed on inspection by URS.

The clay soil was subsequently tested for the presence of PCBs. Five samples were collected in total. Four samples were collected in the shape of a cross, radiating 10 metres from a central sample point located beneath the former transformer area. PCBs were not detected above the method detection limit of 1.1µg/kg in any of the samples (Table 1). Sample locations with respect to the 25m by 25m footprint are provided on Figure 10.

### 4.7.3. Japanese Knotweed

An area of Japanese knotweed growth (Plate 11) was encountered at the off-site boundary of Area B, as shown on Figure 5.

The affected area, including a 7m exclusion zone as per Environment Agency code of practice 'Managing Japanese Knotweed on Development Sites', was estimated at 500m$^2$. Trial pitting suggested that granular fill materials were relatively thin (maximum 0.9m thick) and a very low incidence of ACM was apparent. The ash was underlain by clay with weathered bedrock from as shallow as 1.3m and from as deep as 1.8m. Roots (not necessarily knotweed) were observed to penetrate the clay but were not identified in the weathered bedrock. Competent bedrock was not reached in any of the five trial pits excavated to assess the area (pits terminated at depths of 2-2.5m).

Discussions between the various stakeholders regarding the relatively small scale of the knotweed area in relation to the remediation and redevelopment programme led to an agreed remediation approach which comprised the careful excavation of the granular fill materials and removal from Area 1 to a designated area of the BP main site. The designated area comprised a suitably contained area for chemical treatment of the material.

Prior to excavation, the area was sprayed using a herbicide (Tordon 22) by a BP procured contractor. The removal of the granular fill containing knotweed horizon was undertaken by CRL in general accordance with the Environment Agency code of practice 'Managing Japanese knotweed on development sites'. An estimated 312m$^3$ of material was excavated from the knotweed area (Plate 12) and transferred to the laydown area on the BP main site.

Following completion of the remediation works, the perimeter of the knotweed excavation area was marked with orange bunting prior to handover to the developer (Plate 13). As the excavation was taken down to clay only (under the terms of the remediation contract) any further treatment of the remaining soil for eradication of knotweed is to be determined and progressed by the developer.

## 4.8. Area C

### 4.8.1. Overview

The anthropogenic geology of Area C was typically characterised by granular ash horizons alternating with more cohesive soils. Furthermore, based on the prior site investigations, the incidence of asbestos in the granular fill of Area C was relatively

greater than many other parts of Area 1. To increase confidence that all granular fill materials had been removed as part of the validation, a series of east-west trending trenches were excavated down to bedrock to confirm this prior to the contractor offering Area C to Anchem and URS for validation.

### 4.8.2. Vapour Hot Spot Testing

The remediation strategy required that the observed ground surface at formation level be free of visible contamination with no elevated vapour concentrations.

During March 2007, strong odours that were suspected to be solvent and/ or hydrocarbon related were noted during the excavation of granular fill at the northern margin of Areas C and D. Three trial pits were subsequently excavated in June 2007 in the locations provided on the attached URS Figure 11. The observations, field readings and summary of the analytical results for the samples collected from these trial pits are provided as Table 4.

Whilst elevated PID readings between approx. 100ppm and 600ppm were noted within one or more trial pits, none of the Area 1 RBSLs were exceeded in the samples collected. However, strong hydrocarbon odours were apparent in the underlying weathered bedrock and small globules of free phase floating hydrocarbons observed on the groundwater that entered one of the trial pits. These findings are broadly consistent with the observations and data obtained during URS' 2003 investigation, during which a slight sheen and faint hydrocarbon odour were also noted upon encountering groundwater during the drilling of borehole P1BH011 and trial pit P1TP003 (locations also on Figure 11). In trial pit P1BH011pit, globules of product were observed in standing water at 0.85m. Both of these locations were investigated in February 2003 and were approx. 10m south west of the trial pit area of 6 June 2007. The TPH concentration in the soil sample collected from P1BH011 during 2003 was 3,784mg/kg (at 1.2m bgl) and therefore higher than those detected in the samples of 6 June 2007. The data also suggest that the odours noted in the trial pit area of 6 June 2007 were not linked to the solvent pit area located up topographic gradient where key contaminants used in the solvent pit were trichloroethene, dichloroethene and vinyl chloride.

The above findings confirmed that the chemical criteria had been met but the aesthetic criteria had not been satisfied. Given the passage of time since the June 2007 trial pitting and when considering that the overlying granular soils have been removed, a further 16 trial pits were excavated on 1 February 2008 to assess whether sufficient volatilisation may have occurred to dissipate the odours. Observations made during this exploratory trial pitting with respect to the aesthetic quality ratings are summarised in Table 5 and confirmed that hotspot removal was required. The locations of the 16No. trial pits are also presented on Figure 11.

Two hotspots were excavated in December 2008 as shown in Figure 11. These were as a result of the aesthetic criteria failures that were noted during the aforementioned trial pitting. The first and largest of these extended across Areas C, D and G. It covered an area of approximately 1,100 $m^2$ and was removed to the top terrace for stockpiling. The extent of both of the excavations was determined by visual and olfactory observations. In

addition, nine locations around the extent of the excavation were validated against the full validation suite. Of these, only one location failed, failing for benzo(a)pyrene. This location was excavated, resampled and subsequently passed. The second hotspot excavation extended across Area C, G and the Phase II area. This excavation was approximately 345 $m^2$ in area. Five locations around the extent of the excavation were validated against the full validation suite. All of these passed the validation criteria. The total volume of material removed from the excavations and transferred to the top terrace, as measured by CRL, was 856$m^3$.

## 4.9. Area D

### 4.9.1. Overview

The granular fill largely comprised black ash that was observed to thicken towards the south, in line with a fall in the topographic gradient (shown on Plate 14).

### 4.9.2. Vapour Hot Spot Testing

As noted in Section 4.8.2, strong odours associated with cohesive materials underlying the granular fill in parts of Area C extended eastwards into the western/ north western portion of Area D, and northwards into Area G. The manner in which these materials were investigated and remediated is also described in Section 4.8.2.

## 4.10. Area E

### 4.10.1. Overview

Similar to Area D, the granular fill within Area E largely comprised black ash that thickened towards the south (Plate 14). The fill was typically ca. 1.2m thick on the southern boundary where a sharp gradient change formed the boundary with Area A. A former railway siding was also observed and subsequently removed from the made ground of Area E.

### 4.10.2. Hotspot Removal

During excavation of the granular fill in Area E, a small hotspot of hydrocarbon contaminated soils was encountered in Grid Ref. 271784 195655, which comprised ca. 3$m^3$ of fill coated with a green grease-like substance (Plate 15). Laboratory data confirmed that the TPH concentration of the fill, sample CP_RE13, was elevated at 220,000mg/kg. However, following removal of the fill and segregation of the impacted material for subsequent treatment outside of Area 1 on the main site, the PID walkover and subsequent trial pitting validation confirmed that the underlying materials met the Area 1 RBSLs.

## 4.11. Area F

### 4.11.1. Overview

Granular fill materials in Area F were typically thin (a few hundred millimetres) and were underlain by cohesive materials and relatively shallow bedrock.

The observed incidence of ACM was low in the granular materials and visual and olfactory observations indicative of other contamination were not apparent. Further works other than the removal and treatment of granular fill were therefore not undertaken in Area F.

## 4.12. Area G

### 4.12.1. Overview

Besides the presence of asbestos-containing granular fill, the following contamination was encountered in Area G:

- Asbestos cement and gaskets were identified on the underside of portions of the concrete hardstanding.
- Chlorinated hydrocarbon trichloroethene (TCE) and its breakdown products associated with a former solvent pit.
- Fill materials within part of the westerly portion of Area G contained a very high incidence of ACM that was not amenable to processing.
- Hydrocarbon odours within some cohesive materials did not meet the aesthetic criteria.

The manner by which each of the above was dealt with is discussed in the following subsections.

### 4.12.2. Concrete Hardstanding

It was originally envisaged that with the exception of the Solvent Treatment Area (Section 4.12.3) all concrete hardstanding would be removed from Area G prior to the onset of the remediation works. However, during the initial breaking out of the concrete hardstanding commencing in the north western portion of Area G, asbestos cement fragments and pieces of asbestos containing gasket were encountered, bonded on the underside of the slab.

The incidence of ACM on the underside of slab was generally low and the frequency unpredictable. As such, it was inferred that the presence of ACM resulted from the placement of the cement onto the asbestos containing granular fill.

The works proceeded such that small, manageable sections of concrete (of a few square metres in size) were broken out and turned over (Plate 16). The underside of each piece of hardstanding was then inspected by CRL and any pieces of ACM observed marked

using spray paint (Plate 17). Pieces of hardstanding upon which ACM was not identified were transferred to a temporary stockpile on Area G for subsequent transfer to the Top Terrace. A separate and much smaller stockpile was formed on Area G for those pieces of hardstanding upon which ACM was observed. Pieces of ACM along with chippings of concrete that could not otherwise be practicably separated were removed from the slabs using a small hydraulic breaker attached to an excavator. The ACM and chippings upon which ACM was adhered to were double bagged and placed in an asbestos designated skip for off-site disposal. The larger mass of concrete from which ACM had been removed was transferred to the Top Terrace following further visual observation that ACM was not present. Several thousand square metres of concrete hardstanding were processed in this manner.

### 4.12.3. Solvent Pit Remediation

The voluntary remediation of the former solvent pit involved the dewatering of the sandstone bedrock to expose presumed residual solvent in the fractures and the subsequent extraction of soil vapours to reduce the solvent mass.

The targeted area, designated the Solvent Treatment Area, is presented on Figure 5. The shape identified on this figure represents an area of concrete hardstanding that was left intact during the solvent reduction to assist in providing a seal over the area being pumped.

Drilling of additional boreholes took place between 20th and 26th February 2008 in readiness for the temporary installation of a dual phase extraction (DPE) solvent remediation system (Plates 18 and 19). The DPE system operated between April 2007 and August 2007 and the associated plant was demobilised during mid-October 2007. The solvent reduction works were completed to the satisfaction of the Environment Agency. Further details are provided in Appendix D.

Concrete hardstanding was broken out and removed from the footprint of the Solvent Exclusion Zone following completion of the works. Inspection of the underside of the concrete, subsequent segregation and the removal of identified ACM was undertaken as per the method described in Section 4.12.2.

### 4.12.4. Asbestos Grave

***Introduction***

An area of the site with a particularly high ACM content was identified near the location of the former gas station and this became referred to as the ‘asbestos grave’, see Figure 12. Three specific parts of the asbestos grave were designated as follows:

- ‘Orange’ area;
- ‘Green’ area; and,
- ‘Yellow’ area.

The nature of each of the above areas is detailed below.

***Assessment and Remediation of the 'Orange' Area***

The footprint of the orange area is shown on Figure 12. The fill materials within this area were predominantly cohesive and contained a relatively high proportion of ACM. The remedial criterion for asbestos was not achieved following four attempts of tilling and handpicking. Given that the failures related to the presence of asbestos lagging which was difficult to identify and remove, and which dispersed into small pieces with continued reprocessing, further treatment was considered futile.

The material was designated non-hazardous as the asbestos content (range between 47mg/kg and 980mg/kg) was below the hazardous waste threshold of 1,000mg/kg. Metals, TPH and PAH concentrations were also below their respective hazardous waste threshold limits. A total of 1,172 tonnes were subsequently disposed of off-site to Grundon's Bishops Cleeve facility near Cheltenham, a landfill licensed to accept non-hazardous waste.

***Assessment and Remediation of the 'Green' Area***

During excavation of the northern margin of the orange area, a 3m high vertical face was exposed (shown on Plate 20) revealing what appeared to be a constructed cell of material within which the following distinct horizons were observed:

- Top horizon – overburden of granular fill material, ca. 0.4 to 1m thick. Asbestos content observed to be low and considered amenable to tilling/ hand-picking.
- Upper ash – predominantly black ash with frequent patches of asbestos lagging and gaskets. Horizon thickness ca. 0.3 to 0.6m.
- Asbestos horizon (Plate 21) – not considered amenable to processing due to a very high concentration of ACM (soil in ACM rather than ACM in soil) and sharp metal components (such as chicken wire associated with lagging). ACM largely comprised lagging with much gasket, rope and cement. Horizon thickness ca. 0.25 to 0.7m.
- Lower ash – higher incidence of asbestos in the upper portion of this unit (i.e. that closest to the overlying asbestos horizon). Horizon thickness ca. 0.3 to 0.8m.
- Basal sand – thin horizon (ca. 0.05 to 0.1m) with low asbestos content.

Following assessment of the vertical face, trial pitting and trenching was undertaken to further understand the nature and extent of the grave. Samples were submitted for laboratory analysis for waste characterisation and classification purposes. Discussions between the various stakeholders as to the available options to deal with the 'green' grave area led to the following works being undertaken by CRL:

i. Excavation and stockpiling of the top horizon (granular fill overburden) with subsequent asbestos removal via tilling/ handpicking. A low incidence of ACM was

encountered and this material met the validation requirements for re-use outside of Area 1 (profiling the former tip).

ii. Careful, methodical excavation of the grave starting from the uppermost material and proceeding downwards in layers of ca. 50 to 100mm thick. Following each incremental strip, all observed ACM was sprayed and removed either by hand (small, shallow ACM) or machine (thicker hotspots of ACM);

iii. Segregation of the stripped material into either:

a) Stockpile(s) of materials considered amenable to picking (predominantly the upper ash and lower portion of the lower ash). These were processed by CRL and validated by URS in accordance with the Area 1 remedial criteria; or,

b) Placement into EU approved polythene bags of 0.9m$^3$ capacity of those materials that contained a high proportion of ACM that was not practicable to remove from the soil matrix. Each bag was loaded using a custom fabricated frame that allowed materials to be transferred directly from the excavation. The cylindrical roll neck of each bag was cable tied to prevent loss of material. Bags were stored in a temporary laydown area prior to off-site disposal (Plate 22).

***Assessment and Remediation of the 'Yellow' Area***

To the west of the 'green' area was a further substantial volume of fill material in which sporadic hotspots of ACM or soils containing a high incidence of asbestos and not considered amenable to processing were encountered.

Trial pitting / trenching showed that the yellow area was strongly heterogeneous in the type, incidence and distribution of ACM. Therefore, whereas the 'green' area comprised a layered profile, the nature of the western portion was more akin to a tip in which material was haphazardly placed or later reworked.

Stages 2 and 3 of the approach undertaken for the excavation and segregation of materials in the 'green' area were implemented in the 'yellow' area.

***Off-site Disposal of Grave Materials***

A total of 551No. EU bags (each of 0.9m$^3$ capacity) were generated for off-site disposal from the green (115 bags) and yellow (436 bags) areas of the asbestos grave. Comparatively, the estimated volume of material segregated during the excavation works for subsequent processing and validation was ca. 1,400 m$^3$.

Total organic carbon (TOC) concentrations within the bagged material derived from the 'green' and 'yellow' areas ranged between 11% and 41% exceeded the Waste Acceptance Criteria (WAC) of 6% for a landfill licensed to accept hazardous waste. Through discussions with various landfills and the Environment Agency's National Permitting Team, the material was designated problematic waste. EA approval was subsequently granted to dispose of the waste at Augean's Kings Cliffe hazardous waste

landfill in Peterborough. A total of ca. 564 tonnes of bagged material was transferred to the landfill in auto-sheeted wagons from the green and yellow areas. This was additional to the aforementioned 1,172 tonnes removed from the 'orange' area and disposed of off-site to the Grundon's Bishops Cleeve non-hazardous landfill.

### 4.12.5. Aesthetic Criteria

As noted in Section 4.8.2, strong odours associated with cohesive materials underlying the granular fill in parts of Area C extended eastwards into the western/ north western portion of Area D, and northwards into Area G. The manner in which these materials were investigated and remediated is also described in Section 4.8.2 (also see Figure 11).

## 4.13. Cordon Sanitaire

### 4.13.1. Overview

The footprint of the Cordon Sanitaire once included a petroleum filling station associated with the former BP refinery. Three underground storage tanks (USTs) were removed by BP during 2000. In November 2002, URS collected several soil samples in the vicinity of the former tanks. A memo summarising the findings is presented as Appendix E.

Below-ground structures comprising brick and concrete associated with the former filling station were unearthed in November 2007 during the Area 1 remediation works. These structures included a brick walled interceptor which, at the time of the Area 1 remediation works, was noted to be a functional component of the drainage system through which surface water runoff from the roadway to the north of Area 1 was carried down across the north eastern margin of Area and towards the Britannic House area.

Whilst granular fill was removed from the whole of the Cordon Sanitaire area (in line with the Area 1 Speciation), several below-ground structures and obstructions were left in-situ. and include the brick walled interceptor and two suspected brick built former tank cradles.

## 4.14. Phase 2

### 4.14.1. Overview

Excavation of granular materials from the Phase 2 area took place following the removal of the former high-pressure gas main during January and February 2008.

Ash was present in the area of the former gas governor with ash and clinker present from the area of the former gas main toward the red brick wall that once formed the divide with the conversation area. Trial pitting was undertaken in the former conversation area to assess the presence of ash and ACM in this area. Following tree felling within the conservation area, subsequent excavation confirmed that ash was limited and the incidence of ACM low.

### 4.14.2. Vapour Hot Spot Testing

As noted in Section 4.8.2, strong odours associated with cohesive materials underlying the granular fill in parts of Area C extended south into the Phase II area. The manner in which these materials were investigated and remediated is described in Section 4.8.2.

## 4.15. Development

A vapour resistant membrane is required to be incorporated by the developer into each house or other building likely to be routinely occupied by people. The membrane is required to provide a low-permeability barrier against the ingress of any gas from the ground into the building fabric

The membrane is required to have a design life of 60 years and all services and other penetrations through the vapour resistant membrane are required to be properly sealed. A datasheet for the contractor's proposed membrane is included in Appendix F.

Passive venting is also required to all habitable structures in the form of either a highly permeable, lightly compacted granular layer at least 200mm thick beneath a reinforced concrete floor slab (incorporating a vapour membrane), or a ventilated sub-floor void.

## 4.16. Summary

During the course of the works approximately 35,000m3 of asbestos containing soil was excavated and removed from Area 1. Of this material, 34,000m3 was treated to meet the specification for use elsewhere on the Llandarcy main site (i.e. not Area 1) with approximately 1,000$m^3$ being disposed direct to landfill.

# 5. VALIDATION METHOD

There were five aspects to the validation of the remediation of Area 1:

(i) Sampling and testing of materials prior to re-use outside Area 1, including treated granular fill material.

(ii) Sampling and testing of the edges of excavations made to remove identified contamination below the granular layer.

(iii) Grid sampling and testing of soils in-situ after the remediation works were considered complete.

(iv) Sampling and testing of imported materials, and;

(v) Confirmatory inspection of site derived soil in garden areas after final earthworks.

Approximate sampling frequencies in each instance are set out in the Table below. Of the above, URS personnel undertook items (i), (ii) and (iii), the latter being undertaken at the conclusion of works in a given zone or zones. The Developer is to undertake item (iv) and item (v) is required to be carried out by URS when the development works are at such a stage such that the boundaries and gardens of the individual plots are known.

With the exception of the Lower Car Park, on completion of remediation works the quality of the remaining soil was validated on a 15m grid, with analysis of soil samples from surface at 0.7m depth intervals to rockhead. All samples were analysed for the validation suite and comparisons made with relevant RBSLs. In instances where exceedances of one or more RBSLs were reported, further excavation of the relevant area was undertaken.

Further validation will be undertaken in all garden plots as per items 13 and 14 in the table below (an initial area having been completed as of November 2009 – see Section 6.10). Considering the limited nature of the known potentially contaminative prior uses of Area 1, and as the soil being tested is expected to be generally natural material in-situ, the validation frequency is considered to be conservative.

The full validation test programme is set out in the following table:

| Category | Source/ Final Location | Responsible Party | Testing for the Validation Suite at the following frequency: | Test Suite |
|---|---|---|---|---|
| 1 | Imported quarried material | contractor | 1 per source ex situ, composite of 5 regular sub-samples (see note 1) | VS |
| 2 | Imported Soil from greenfield Site | contractor | 1 per 250m$^3$ ex situ, composite of 5 regular sub-samples | VS |
| 3 | Imported Soil from | contractor | 1 per 25m$^3$ ex situ, | VS |

| Category | Source/ Final Location | Responsible Party | Testing for the Validation Suite at the following frequency: | Test Suite |
|---|---|---|---|---|
| | brownfield Site | | composite of 5 sub-samples | |
| 4 | Crushed rock arising from excavation during development for use in capping layer | project manager | 1 per 200m$^3$ ex situ, composite of 5 sub-samples (see note 1) | VS |
| 5 | Soil in-situ beneath granular fill once granular fill is removed (Excl. Lower Car Park) | project manager | 15m grid / 1 per 225m$^2$, at 0.7m vertical intervals to rockhead | VS |
| 6 | Stockpiled excavated materials for TPH/PAH exceedances | project manager | 1 per 50m$^3$ ex situ, composite of 5 sub-samples | TPH/PAH as appropriate |
| 7 | Stockpiled treated granular fill materials | project manager | 1 per 50m$^3$ ex situ, composite of 5 sub-samples | Asbestos Only |
| 8 | Excess site-won materials arising from contractor's earthworks (after removal of suspect contaminated material) for re-use in commercial or recreational development | project manager | 1 per 500m3 ex situ, composite of 5 sub-samples | VS |
| 9 | Testing of in-situ below 1m in Lower Car Park | project manager | As required based on visual inspection | VS |
| 10 | Face of remedial excavations (identified TPH/PAH RBSL exceedances) | project manager | 1 per 10m2, minimum of 1 per face | TPH/ PAH as appropriate |
| 11 | Along existing service excavations | project manager | 1 per 20m of trench | VS |
| 12 | Material won from agreed location elsewhere on BP Llandarcy | contractor | 1 per 50m$^3$ ex situ, composite of 5 sub-samples | VS |
| 13 | Site derived material between 0.5m and 1m below FSL in residential plots (Lower Car Park only) | project manager | 1 per garden, composite of 5 sub-samples | VS |
| 14 | Site derived material between 0.5m below FSL and rock head in residential plots (area | project manager | At 0.7m vertical intervals in each garden | VS |

| Category | Source/ Final Location | Responsible Party | Testing for the Validation Suite at the following frequency: | Test Suite |
|---|---|---|---|---|
| | excluding Lower Car Park only) | | | |

VS – Validation suite comprising TPH, VOC, PAHs, Metals and Asbestos

Note 1: Sampling frequency was amended to this value during the course of the works with NPT's approval (Ref. Appendix B)

The following table presents the validation suite and criteria which represent the quality targets to be met at the frequencies set out above:

| Parameter | All remaining soils, excavated surplus soils and imported material [1] (mg/kg) Residential | Excavated treated granular material (mg/kg) |
|---|---|---|
| Asbestos (sum of all types) | 200 | 200 |
| Arsenic[2] | 64 | The quality of the material was not be affected by its treatment, other than as regards the asbestos content. Testing of this material for parameters other than asbestos had previously been undertaken. |
| Cadmium | 3.6 | |
| Chromium | 130 | |
| Mercury[2] | 1 | |
| Nickel[2] | 50 | |
| Selenium | 3 | |
| Lead[2] | 337 | |
| Vanadium | 416 | |
| Copper[2] | 478 | |
| Zinc[3] | 3280 | |
| Benzene | 0.12 | |
| Ethylbenzene | 37 | |
| Toluene | 36 | |
| Xylene | 32 | |
| Benzo(a)pyrene[2,4] | 0.9 | |
| 1,2-Dichloroethane | 0.04 | |
| Dichloromethane | 5 | |
| Tetrachloroethene | 11 | |
| Trichloroethene | 1 | |
| Vinyl Chloride | 0.01 | |

| Parameter | All remaining soils, excavated surplus soils and imported material [1] (mg/kg) Residential | Excavated treated granular material (mg/kg) |
|---|---|---|
| 1,2-Dichloroethene | 4 | |
| 1,1,1-Trichloroethane | 154 | |
| TPH | 1,717 | |

Note 1: Excluded existing natural reworked material in Lower Car Park (unless testing was required due to visual failure at formation level or elevated VOC detection)

Note 2: Marginal exceedances of the RBSL for arsenic, copper, lead, mercury, nickel and Benzo(a)Pyrene were detected in a limited number of locations and it was accepted by NPT that these were not of concern. See Appendix B for correspondence and Tables 3a-3d for results

Note 3: The RBSL for zinc was revised to this value in agreement with NPT during the course of the works (see Appendix B)

Note 4: In the absence of published UK soil guideline values for PAHs, the UK published health criteria values for benzo(a)pyrene have been used to derive an RBSL for BaP based on the agreed risk assessment methodology for Llandarcy. 12 of the 16 US EPA priority PAHs are considered to be carcinogenic. In order to provide a mechanism for comparing the concentration of the remaining 11 carcinogenic PAHs with an RBSL, the concentrations of each of the eleven PAHs should be multiplied by their corresponding toxicity equivalency factor (TEQ or TEF) to BaP and summed. The summation of the resulting values for these 11 plus the concentration of BaP should be compared directly to the RBSL for BaP.

Together the above parameters comprise the 'Validation Suite'.

In addition to the chemical quality criteria, aesthetic quality targets were adopted as follows:

| Rating | Visual | Olfactory |
|---|---|---|
| 0 | No Staining | No Odour |
| 1 | Occasional Discolouration | Faint Odour |
| 2 | Frequent Discolouration | Distinct but not strong |
| 3 | Small amounts of heavy staining | Strong odour |
| 4 | Heavy black staining | Strong odour discernable in ambient air |
| 5 | Visible product | Overwhelming Odour |

## 5.1. Visual Walkover

Following the removal of fill material in a given area and the resultant exposure of the surface of the natural soil, a walkover was undertaken by HSE licensed asbestos analysts, Anchem Limited, to confirm whether the surface was deemed free of visible ACM.

Subsequent to the above clearance exercise, a visual inspection of the surface was undertaken by URS as a further visual check for the presence of ACM and for evidence of staining. Observations for odour from the exposed surface were then possible and undertaken during a URS' walkover. A check was also made for the presence of any significant volumes of residual ash, which was to be removed during the site remediation.

## 5.2. PID Walkover

As part of URS' visual walkover, samples were collected for evidence of elevated vapour concentrations using a portable Photo-ionisation Detector (PID) to provide evidence of the presence of Volatile Organic Compounds (VOCs), if present.

Soil samples for headspace PID analysis were collected from approximate 10 metre grid centres, as presented on Figure 13. The immediate surface of the soil was scraped off prior to sample collection given that the purpose of the headspace analysis was to assess the potential for organic contamination in the underlying cohesive materials. This was undertaken prior to the reprofiling earthworks to minimise the potential for spreading potential contamination (if indeed present) across the site.

## 5.3. Bulk Earthworks Removal

To achieve the required development levels, an earthworks removal and reprofiling programme of the Area 1 site was undertaken by Dawnus on behalf of Edward Ware Homes. The removal of surplus earthworks followed the removal of all identified granular fill, the visual and PID walkovers as well as URS' validation trial pitting (Section 5.4)

Whilst some low points that followed the remedial cut were filled to achieve the development levels in certain parts of the site, the reprofiling works involved an overall net removal of material from the site.

A total volume of approximately 3,000m3 of site-won materials arising from the contractor's earthworks was stockpiled for re-use. This material was tested by URS and the results are presented in Tables 6a to 6d. Of the 15no. samples collected, materials from those stockpiles represented by samples SPCE11 and SPCE13 were not re-used on Area 1. These were removed to the top terrace due to marginal exceedance of the RBSL for nickel. Dawnus has used acceptable materials from the remaining stockpiles for raising site levels, principally in the former Lower Car Park area above the geogrid warning layer but also for properties immediately to the north of this.

Following removal of suspect contaminated material (confirmed by validation testing) or the removal of materials which did not satisfy the aesthetic criteria based on visual and

olfactory observations (i.e. even if chemical criteria were met), these materials were transferred outside of Area 1 to the Top Terrace on the main site and subsequently validated by URS. Materials meeting the requisite validation protocols were available for re-use in commercial or recreational development elsewhere on the Llandarcy Main Site. Plates 23 and 24 show the southern bank of the Lower Car Park (Area A) prior to and following excavation to a minimum depth of 1m below the Finished Surface Levels (FSL). As-built levels for the site following remediation are provided on Figure 14. As-built levels in the Lower Car Park following remediation are provided on Figure 15.

## 5.4. Validation Trial Pitting

Validation trial pitting was undertaken on a 15m herringbone grid at depth intervals of 0.6m across Area 1, with the exception of the Lower Car Park (LCP, Area A). Validation Trial Pit (VTP) locations are provided on Figure 16. As noted in Section 3.3, the strategy for the LCP was such that following the visual and PID walkovers, the next step in meeting the remediation protocols was the installation of a warning layer at 1m below finished surface levels.

VTPs were excavated on an area by area basis following the removal of granular fill and completion of the PID and visual walkovers. Samples collected during the VTP works were submitted to STL for chemical analysis of the full validation suite (Section 5). Hotspot removal was subsequently undertaken in those areas that exceeded one or more of the site specific RBSLs.

Where hotspot removal involved the excavation of soils in which contaminant concentrations exceeded the RBSLs for either inorganic (hence non-volatile) or semi-volatile organic compounds, field assessment techniques (visual/olfactory observation and use of a PID) were unsuitable in assessing excavation limits. Therefore, each hotspot was subsequently removed via excavation of a nominal 5m by 5m surface area by 0.5m deep. Laboratory analysis of samples collected from each excavation face and base were collected to confirm that there were no further exceedance of the validation criteria. A summary of the failures and subsequent testing can be found in Tables 3a to 3e. These are also discussed on an area by area basis in Section 6.

## 5.5. Validation of Garden Plots

Once the site has been profiled and construction has advanced to the point that property boundaries are known with confidence, the soil which will form the second half metre below finished level in garden areas is required to be turned over mechanically or placed in a controlled manner by the contractor and subject to visual inspection by URS. Final validation samples will be taken of that layer down to rock head (or to the warning membrane in the Lower Car Park). This has been completed for an initial area of the site as of November 2009, as shown in Figure 19 (see Section 6.10).

# 6. VALIDATION RESULTS

## 6.1. Lower Car Park (AREA A)

### 6.1.1. Finished Surface Levels

The remedial concept for this area of the site required that soil materials will be of better quality than the remedial criteria excepting soils at greater than 1m depth. The initial stage of the remediation undertaken by CRL therefore required the reduction of ground levels within the Lower Car Park (LCP) to at least 1m below finished surface level or to the level at which competent bedrock is exposed.

The finished surface levels for the development within the LCP were confirmed by Robert Adams Architects on their AutoCad drawing provided to URS on 24 January 2008, included herein as Figure 17, Proposed Development Levels. A detailed survey of ground levels within the LCP was completed on 15 April 2008 showing the elevations of the terraces cut as part of the earthworks phase prior to development. This is shown in Figure 15. Photographs taken prior to and following the earthworks cut in the LCP are provided respectively as Plates 23 and 24.

Based on the above drawings URS confirms that the levels to which CRL excavated was generally to at least 1m below finished surface level with the exception of the following:

1. Where competent rock was encountered within 1m of finished surface level in the northern part of the LCP, rendering any further excavation unnecessary.

2. Along the eastern boundary the earthworks batter was such that the 1m below finished surface level criteria was not initially achieved. Following removal of the fencing that formed the eastern boundary of Area 1 in the LCP, excavation was undertaken by Dawnus under URS' watching brief.

Comparison of Robert Adams Architects' drawing (Figure 17) with CRL's subsequent reported levels confirms that, where not limited by the presence of rock, excavation in all areas was at least 1m below finished surface level.

### 6.1.2. Formation Quality

The remediation specification requires that the ground surface at formation level shall be free of visible contamination with no elevated vapour concentrations observed.

URS undertook a walkover survey on 30 October, 1 November and 5 December 2007. No areas of visible contamination were identified at the surface. The surface was also tested by URS for elevated vapour concentrations on a 10m grid (approx.) using a portable photoionisation detector (PID) using a 10.6eV lamp on the aforementioned dates. The results of this survey are provided in Table 2. PID validation locations are as indicated on Figure 13. No elevated vapour concentrations were detected.

### 6.1.3. Removal of Services and Obstructions

Following removal of the fill material during the cutting of plateaus to remediation level on the Lower Car Park bank, two manholes and a pipe were exposed. Whilst the pipe and manholes were inferred to be present at depths likely to be greater than 1 metre below finished surface level, the specification requires that all buried services and obstructions be removed as part of the remediation works. Following the excavation of both ends of the pipe (given that the contents of the pipe was unknown) outside of the development area, the steel pipe was cut and removed. BP subsequently arranged for each end to be bunged. The two manholes were removed in their entirety. Indicators of contamination were not observed during the pipe removal works.

### 6.1.4. LCP Warning Layer

The remedial strategy for the LCP required the developer to place a warning layer at a minimum 1m depth. The specific type of warning layer to be installed was agreed between the developer, URS and BP. The specification sheet for the selected warning layer, Boddingtons Indicator Mesh, is provided in Appendix G.

Figure 18 shows the areas in which the warning layer was placed as well as its level relative to the development. There was no requirement to install that layer where rockhead was exposed, hence its absence in such areas.

Observations made by URS together with photographs and drawings provided by the contractor responsible for the installation of the retaining structures and foundations in the LCP (Dawnus) confirm that the warning layer achieved the requirements of the Specification.

## 6.2. AREA B

### 6.2.1. Removal of Granular Fill

URS' walkover survey across Area B on 30 October and 1 November 2007 confirmed that all significant visible areas of granular fill material had been removed from this portion of Area 1.

### 6.2.2. Formation Quality

No elevated vapour concentrations were detected during URS' PID survey, undertaken in Area B on 30 October and 1 November 2007. PID readings are provided in Table 2.

Chemical data collected during validation trial pitting in Area B identified no exceedance of the validation criteria. Location 29 (see Figure 16) was not trial pitted due to its position within the area from which Japanese knotweed was removed from shallow soils. Instead, this location was hand augered for sampling to remove the risk of rhizome movement by plant movement (refer to Section 4.7.3).

## 6.3. AREA C

### 6.3.1. Removal of Granular Fill

URS' walkover survey across Area C on 30 October and 1 November 2007 confirmed that all significant visible granular fill material had been removed from this portion of Area 1.

### 6.3.2. Formation Quality

URS' PID survey, undertaken in Area C on 30 October and 1 November 2007 confirmed that one location (vapour concentration of 40.2ppm) exceeded the typical background of <1pppm. A soil sample (ref CP_RE46) was taken at this location and tested against the validation suite included in the remediation specification. The testing reported no exceedance of the validation suite RBSLs (see Tables 3a to 3e).

As described in Section 4.8.2, two aesthetic hotspots were excavated to extend into Area C. These were excavated, prior to validation trial pitting, to the extent that aesthetic observations reached quality targets. The excavations were subsequently sampled and validated against the chemical criteria. No failures were reported within Area C.

Samples collected from the nine validation trial pits (locations on Figure 16) exceeded the Area 1 validation criteria. Of these nine, further excavation was undertaken in the following two locations on 30 Sept 2009:

- TP164 -TPH exceedance (2500 mg/kg). This was re-sampled following excavation and passed.
- TP165 - TPH exceedance (2900 mg/kg). This was re-sampled following excavation and failed again (TPH 2200 mg/kg). Further excavation and removal of material was carried out on 12 Oct 2009. This location was then re-sampled and passed.

Following statistical assessment, the remaining seven sample locations in which one or more metals marginally exceeded their respective RBSLs remained in-situ with agreement from NPT council. These were as follows:

- TP134 – benzo(a)pyrene exceedance (4.7 mg/kg).
- TP152 – benzo(a)pyrene exceedance (2.5 mg/kg).
- TP154 - mercury exceedance (13 mg/kg) and aesthetic exceedance. This location was excavated and resampled. Subsequent mercury exceedance (1.3 mg/kg); location remained in-situ with agreement from NPT council.
- TP180 – nickel exceedance (54 mg/kg).
- TP203 - nickel exceedance (59 mg/kg).
- TP204 - nickel exceedance (57 mg/kg).

- TP216 – nickel exceedance (70 mg/kg).

## 6.4. AREA D

### 6.4.1. Removal of Granular Fill

URS' walkover survey across Area D on 30 October, 1 November and 22-23 November 2007 confirmed that all significant visible granular fill material had been removed from this portion of Area 1.

### 6.4.2. Formation Quality

URS' PID survey, undertaken in Area D on 30 October and 1 November 2007 confirmed that one location (vapour concentration of 170ppm) exceeded the typical background of <1pppm. A soil sample (ref CP_RE48) was taken at this location and tested against the validation suite included in the remediation specification. The testing reported no exceedance of the validation suite RBSLs (see Tables 3a-3e).

As described in Section 4.8.2, one aesthetic hotspot was excavated to extend into Area D. This was excavated, prior to validation trial pitting, to the extent that aesthetic observations reached quality targets. The excavation was subsequently sampled and validated against the chemical criteria.

Samples collected from the following two validation trial pits (locations on Figure 16) exceeded the Area 1 validation criteria.

- TP082 – nickel exceedance (51 mg/kg). This location was left in-situ with agreement from NPT council.
- TP124 – nickel exceedance (55 mg/kg). This location was left in-situ with agreement from NPT council.

### 6.4.3. Removal of Services and Obstructions

Below ground services and obstruction were not observed to be present upon completion of the remedial works in Area D.

## 6.5. AREA E

### 6.5.1. Removal of Granular Fill

URS' walkover survey across Area E on 1 November and 22 November 2007 confirmed that all significant visible granular fill material had been removed from this portion of Area 1.

### 6.5.2. Formation Quality

No elevated vapour concentrations were detected during URS' PID survey in Area E.

Samples collected from the following two validation trial pits (locations on Figure 16) exceeded the Area 1 validation criteria. Both were left in-situ following statistical assessment and agreement from NPT council:

- TP065 – nickel exceedance (66mg/kg at 0.15m and 53mg/kg at 0.65m).
- TP083 – lead exceedance (540 mg/kg).

### 6.5.3. Removal of Services and Obstructions

Below ground services and obstruction were not observed to be present upon completion of the remedial works in Area E.

## 6.6. AREA F

### 6.6.1. Removal of Granular Fill

URS walkover survey across Area F on 1 November and 22 November 2007 confirmed that all significant visible granular fill material had been removed from this portion of Area 1.

### 6.6.2. Formation Quality

No elevated vapour concentrations were detected during URS' PID survey, undertaken in Area B on 1 November and 22 November 2007.

Samples collected from the following four validation trial pits (locations on Figure 16) exceeded the Area 1 validation criteria:

- TP026 - arsenic exceedance (110 mg/kg) and cadmium exceedance (3.7mg/kg). Further excavation was undertaken and the sample subsequently passed the RBSLs.
- TP30 - benzo(a)pyrene exceedances (1.5 to 2.4 mg/kg). This location was left in-situ with agreement from NPT council.
- TP037 – exceedances for lead (360 to 2,500 mg/kg on different excavation faces), nickel (51 to 57 mg/kg on different faces) and zinc (3,600 mg/kg) on northern face. Further excavation was undertaken and the sample subsequently passed the RBSLs.
- TP048 - lead exceedance (2,500 mg/kg) and zinc exceedance (3,600 mg/kg). Further excavation was undertaken and the sample subsequently passed the RBSLs.

### 6.6.3. Removal of Services and Obstructions

Below ground services and obstruction were not observed to be present upon completion of the remedial works in Area E.

## 6.7. AREA G

URS' walkover survey across Area G on 1 September and 3 September 2008 confirmed that all significant visible granular fill material had been removed from this portion of Area 1. PID readings are provided in Table 2.

### 6.7.1. Formation Quality

As described in Section 4.8.2, one aesthetic hotspot was excavated to extend into Area D. This was excavated, prior to validation trial pitting, to the extent that aesthetic observations reached quality targets. The excavation was subsequently sampled and validated against the chemical criteria. One chemical exceedance was reported for benzo(a)pyrene (10 mg/kg). This location was subsequently resampled and passed the validation criteria.

Samples collected from the following 16No. validation trial pits (locations on Figure 16) exceeded the Area 1 validation criteria:

- TP053 - benzo(a)pyrene exceedance (2.7 mg/kg). This location was left in-situ with agreement from NPT council.
- TP068 - nickel exceedance (51 mg/kg). This location was left in-situ with agreement from NPT council.
- TP079 - nickel exceedance (54 mg/kg). This location was left in-situ with agreement from NPT council.
- TP080 - arsenic exceedance (68 mg/kg), copper exceedance (550 mg/kg), TPH exceedance (2000 mg/kg) and aesthetic exceedances. Further excavation was undertaken to remove all material from this location until rock head was exposed, also removing the need for any further testing.
- TP089 - benzo(a)pyrene exceedance (1.8 mg/kg). This location was left in-situ with agreement from NPT council.
- TP107 - copper exceedance (720 mg/kg) and lead exceedance (410 mg/kg). This location was left in-situ with agreement from NPT council.
- TP119 - nickel exceedance (64 mg/kg). This location was left in-situ with agreement from NPT council.
- TP120 - cadmium exceedance (34 mg/kg). This location was excavated, resampled and subsequently passed the validation criteria.
- TP122 - aesthetic exceedances. This location was excavated until aesthetic quality targets were satisfied.
- TP130 - lead exceedance (400 mg/kg). This location was left in-situ with agreement from NPT council.

- TP133 - lead exceedance (630 mg/kg) and mercury exceedance (1.3 mg/kg). This location was excavated, resampled and subsequently passed the validation criteria.
- TP141 - nickel exceedance (51 mg/kg). This location was left in-situ with agreement from NPT council.
- TP151 –nickel exceedance (51 mg/kg). Location was left in-situ with agreement from NPT council.
- TP152 - benzo(a)pyrene exceedance (2.5 mg/kg) and nickel exceedance (53 mg/kg). This location was left in-situ with agreement from NPT council.
- TP162 - nickel exceedance (55 mg/kg). This location was left in-situ with agreement from NPT council.
- TP172 – copper exceedance (640 mg/kg), nickel exceedance (58 mg/kg) and TPH exceedance (6,000 mg/kg at 0.1m and 5,500 mg/kg at 0.7 m). Further excavation was undertaken to remove all material from this location until rock head was exposed, also removing the need for any further testing.

### 6.7.2. Removal of Services and Obstructions

Following the removal of the fill and steel tank from the former solvent pit and the fill from the other sumps found in Area 1, reasonable efforts were made to break out the concrete walls and base following removal of liquids from the pits. All of the pits were found to be set in the sandstone bedrock and due to their relatively deep bases compared to their width, the breaking out of the bases could not be readily achieved. Where the base was broken out, competent bedrock was encountered although adequate samples could not be obtained. All sumps were backfilled with validated cohesive materials obtained from Area 1.

As a precautionary measure, whilst remedial works have been undertaken within the area of the former solvent pit, the Developer is prevented by the terms of the development agreement with BP from constructing residential dwellings within the Solvent Exclusion Zone. The development levels are to be set such that there is slight convex profile to the landform promoting runoff away from infilled pit with a minimum thickness of 0.5m of site derived natural clay material placed as sub-soil extending over the infilled pit. The contractor shall determine the depth of topsoil to be placed over this area to provide sufficient depth for vegetation growth.

## 6.8. CORDON SANITAIRE

### 6.8.1. Removal of Granular Fill

URS walkover survey across Area F on 11 February 2008 confirmed that all significant visible granular fill material had been removed from this portion of Area 1.

### 6.8.2. Formation Quality

Chemical data collected during validation trial pitting in the Cordon Sanitaire identified seven locations that exceeded the validation criteria (Figure 16). Of these seven, further excavation was undertaken in the following three locations:

- TP011 - arsenic exceedance (130 mg/kg). This was re-sampled following excavationon 30 Sept 2009 and failed again (Arsenic 70 mg/kg). Further excavation and removal of material was carried out on 12 Oct 2009. This location was then re-sampled and passed.
- TP017 - chromium exceedance (150 mg/kg) and TPH exceedance (2200 mg/kg). Further excavation was undertaken but no sample collection was possible due to termination on rock.
- TP018 – exceedances for lead (480mg/kg, 1800 mg/kg and 2,900 mg/kg on different faces of the excavation), nickel (53 mg/kg) and zinc (4,400 mg/kg). Further excavation was undertaken but no sample collection was possible due to termination on rock.

Following statistical assessment, the following sample locations in which one or metals marginally exceeded their respective RBSLs remained in-situ with agreement from NPT council:

- TP007 - arsenic exceedance (85 mg/kg).
- TP012 - arsenic exceedance (76 mg/kg) and nickel exceedance (51 mg/kg).
- TP013 - nickel; exceedance (51 mg/kg).
- TP019 - arsenic exceedance (67 mg/kg).

### 6.8.3. Removal of Services and Obstructions

Below-ground structures comprising brick and concrete associated with the former filling station were unearthed in November 2007 during the Area 1 remediation works. These structures included a brick walled interceptor which, at the time of the Area 1 remediation works, was noted to be a functional component of the drainage system through which surface water runoff from the roadway to the north of Area 1 was carried down across the north eastern margin of Area and towards the Britannic House area. The interceptor was therefore not removed as it was in use.

## 6.9. PHASE 2 AREA

### 6.9.1. Removal of Granular Fill

URS walkover survey across Area F on 9 September 2008 confirmed that all significant visible granular fill material had been removed from this portion of Area 1.

### 6.9.2. Formation Quality

No elevated vapour concentrations were detected during URS' PID survey, undertaken in Area B on 9 September 2008.

Samples collected from 25No. validation trial pits in the Phase 2 area (locations on Figure 16) exceeded the Area 1 validation criteria. Of these, further excavation was undertaken in the following 12No. locations:

- TP171 – benzo(a)pyrene (1.5 mg/kg) and lead exceedance (520 mg/kg). This location was excavated and subsequent re-sampling passed validation criteria.
- TP172 – copper exceedance (640 mg/kg), nickel exceedance (58 mg/kg), TPH exceedance (6,000 mg/kg at 0.1m and 5,500mg/kg at 0.7m) and aesthetic exceedances. This location was excavated until aesthetic quality targets were satisfied. Subsequently re-sampled and passed validation criteria.
- TP183 – cadmium exceedance (4.8 mg/kg) and zinc exceedance (5,400 mg/kg). This was resampled and subsequent re-sampling passed validation criteria.
- TP189 - aesthetic exceedances. This location was excavated until aesthetic quality targets were satisfied.
- TP196 – multiple exceedances for arsenic, copper, lead, mercury and zinc. This location was excavated and subsequent re-sampling passed validation criteria.
- TP208 – multiple exceedances for benzo(a)pyrene, arsenic, lead, mercury and zinc. This location was excavated and subsequent re-sampling passed validation criteria.
- TP211 – TPH exceedances (2800 mg/kg at 2.1 m and 2000 mg/kg at 2.8 m) and aesthetic exceedances. Further excavation was undertaken to remove all material from this location until rock head was exposed, also removing the need for any further testing.
- TP212- aesthetic exceedances. This location was excavated until aesthetic quality targets were satisfied.
- TP213- aesthetic exceedances. This location was excavated until aesthetic quality targets were satisfied.
- TP236 – multiple benzo(a)pyrene, lead and arsenic exceedances. This location was excavated and subsequent re-sampling passed validation criteria.
- TP244 – nickel exceedance (75 mg/kg) and benzo(a)pyrene exceedance (6.4mg/kg). This location was excavated and subsequent re-sampling passed validation criteria.
- TP248 – nickel exceedance (58 mg/kg). This location was excavated and subsequent re-sampling passed validation criteria.

Following statistical assessment, the following 13No. sample locations in the Phase 2 area in which one or metals marginally exceeded their respective RBSLs remained in-situ with agreement from NPT council:

- TP184 - nickel exceedance (56 mg/kg at 0.1 m and 51 mg/kg at 1.4 m).
- TP185 - nickel exceedance (53 mg/kg at 0.7 m, 64 mg/kg at 1.4m and 63 mg/kg at 2.1 m).
- TP186 - nickel exceedance (93 mg/kg at 0.1 m and 62 mg/kg at 0.7 m).
- TP207 - nickel exceedance (59 mg/kg).
- TP210 – lead exceedance (430 mg/kg).
- TP218 – benzo(a)pyrene exceedance (1.3 mg/kg) and nickel exceedances (51 mg/kg at 0.7 m and 67 mg/kg at 1.4 m).
- TP219 - nickel exceedance (69 mg/kg).
- TP227 - nickel exceedance (53 mg/kg at 1.4 m).
- TP229 - nickel exceedance (63 mg/kg).
- TP230 - lead exceedance (700mg/kg). This location was excavated and resampled. Nickel concentration of 57mg/kg in subsequent sample exceeded RBSL. This location was left in-situ with agreement from NPT council.
- TP231 - nickel exceedance (60 mg/kg).
- TP233 - nickel exceedance (59 mg/kg at 1.4 m and 58 mg/kg at 2.1 m).
- TP250 – benzo(a)pyrene exceedance (1.2 mg/kg).

## 6.10. Validation of Garden Plots

Figure 19 indicates the properties that were available for final validation testing in the garden areas as of November 2009. Testing of the gardens was undertaken by URS during October and November 2009. No testing was undertaken in properties without private gardens, as indicated on Figure 19.

The material representing the second half metre of soil below the final finished ground level was mechanically turned over within the tested plots and, in all cases, found to meet the aesthetic criteria (see Section 5).

All soil samples taken within the garden areas met the validation criteria with the exception of test location GV_57. This was found to exceed the RBSL for benzo(a)pyrene (2.3mg/kg tested vs 0.9mg/kg acceptance level). All soils in this garden area were subsequently excavated down to rock level and removed from site with validated soils being used to re-fill this area. Test results are provided in Table 7.

Testing of soils within garden areas remains to be undertaken in the remainder of the Area 1 site as the development progresses.

## 6.11. Future Considerations

### 6.11.1. Asbestos

There is the potential that previously unidentified ACMs may be encountered in the event of future earthworks in previously disturbed ground, principally the Lower Car Park below the warning layer. The URS report 'Asbestos Delineation Works, Former BP Car Park Area', ref FR1265 dated 17th December 2004, provides details of the types of ACM that were previously encountered. If ACMs are disturbed during earthworks there is the potential for asbestos fibres to be released into the atmosphere.

### 6.11.2. Groundwater Drainage

As anticipated, works to terrace the site following remediation have resulted in cutting and the need for retaining structures in the lower areas of the site. In the event that site development results in a plausible risk that future residents may come into contact with groundwater from the bedrock, the Developer is to install land drains at a minimum depth of 1m (below final ground level) and a maximum of 1.5m or rockhead, whichever is shallower. The purpose of such drainage would be to control ground water level as a precautionary measure in the event that contaminated water remains within the rock. Provision would be made for discharge of any water arising, appropriate to its quality.

Condition 12 of the planning permission requires that no land drainage shall be allowed to flow to the existing foul drain in order to limit the flow of water to the foul drainage system. It is therefore anticipated that in the event that land drainage is required, it will discharge in common with the stormwater drainage system via an interceptor. This may entail a low volume discharge with a petroleum hydrocarbon content not dissimilar to that from a car park.

Should the contractor's earthworks expose groundwater at the surface, the contractor shall be responsible for the management and control of this water during construction and subsequently such that the public are prevented from coming into contact with it following development. Any disposal, control or discharge of water shall be compliant with all site and regulatory requirements.

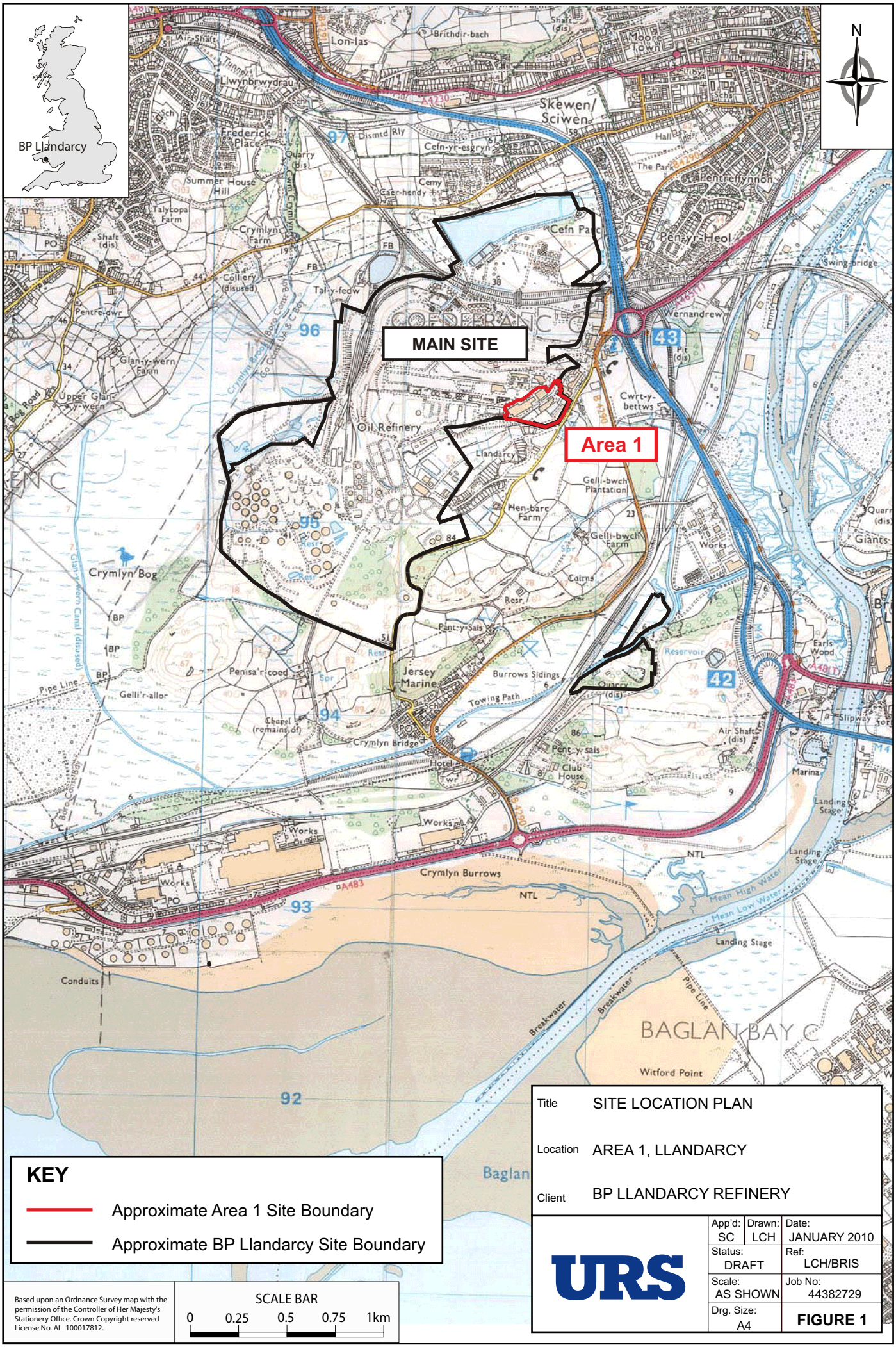
# 7. CONCLUSIONS

With the exception of the following item, URS considers that the Area 1 site has been validated as remediated consistent with the requirements of the remediation strategy, thus allowing planning condition (ref. P/2000/1284) No. 8 to be discharged:

- Final validation sampling of site derived soil in the remaining garden plots to be developed after final earthworks (i.e. all plots except those shown in Figure 19).
- Testing of any imported soils/materials used in the development works.

Whilst the remediation and validation are effectively complete, the construction phase of the works requires a vapour resistant membrane and passive venting layer to be incorporated by the developer into each house or other building likely to be routinely occupied by people. Furthermore, restrictive covenants are required by BP to be incorporated into the house sale agreements such that the integrity of vapour membranes are to be maintained and that these are incorporated into extensions and new buildings likely to be occupied by people. In the Lower Car Park (Area A), covenants are required such that the integrity of the capping layer is maintained.

# Figures




## KEY

- Approximate Area 1 Site Boundary
- Approximate BP Llandarcy Site Boundary

| | |
|---|---|
| Title | SITE LOCATION PLAN |
| Location | AREA 1, LLANDARCY |
| Client | BP LLANDARCY REFINERY |

URS

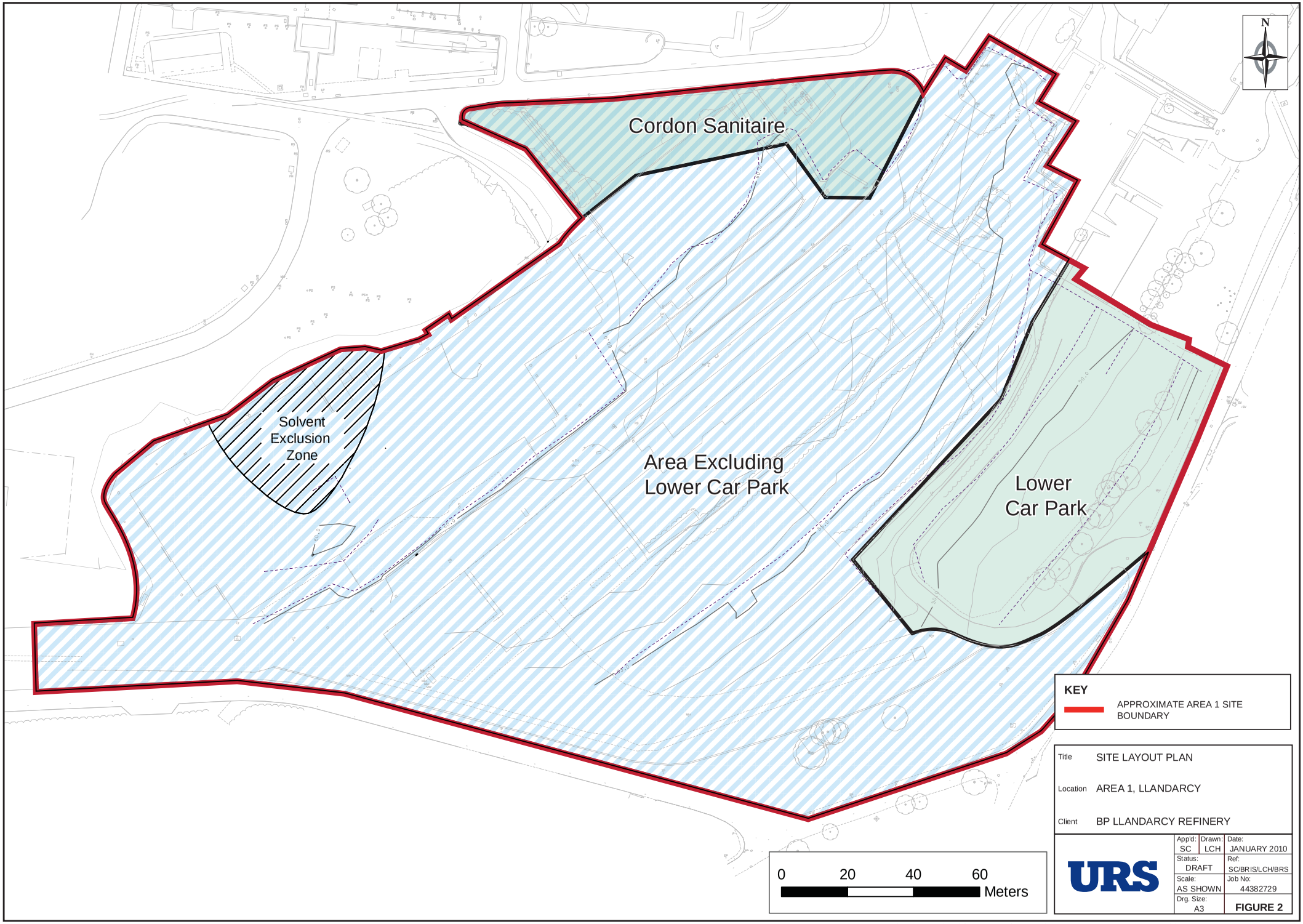
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| SC | LCH | JANUARY 2010 |
| Status: DRAFT | | Ref: LCH/BRIS |
| Scale: AS SHOWN | | Job No: 44382729 |
| Drg. Size: A4 | | **FIGURE 1** |

SCALE BAR

0 0.25 0.5 0.75 1km

Based upon an Ordnance Survey map with the permission of the Controller of Her Majesty's Stationery Office. Crown Copyright reserved License No. AL 100017812.

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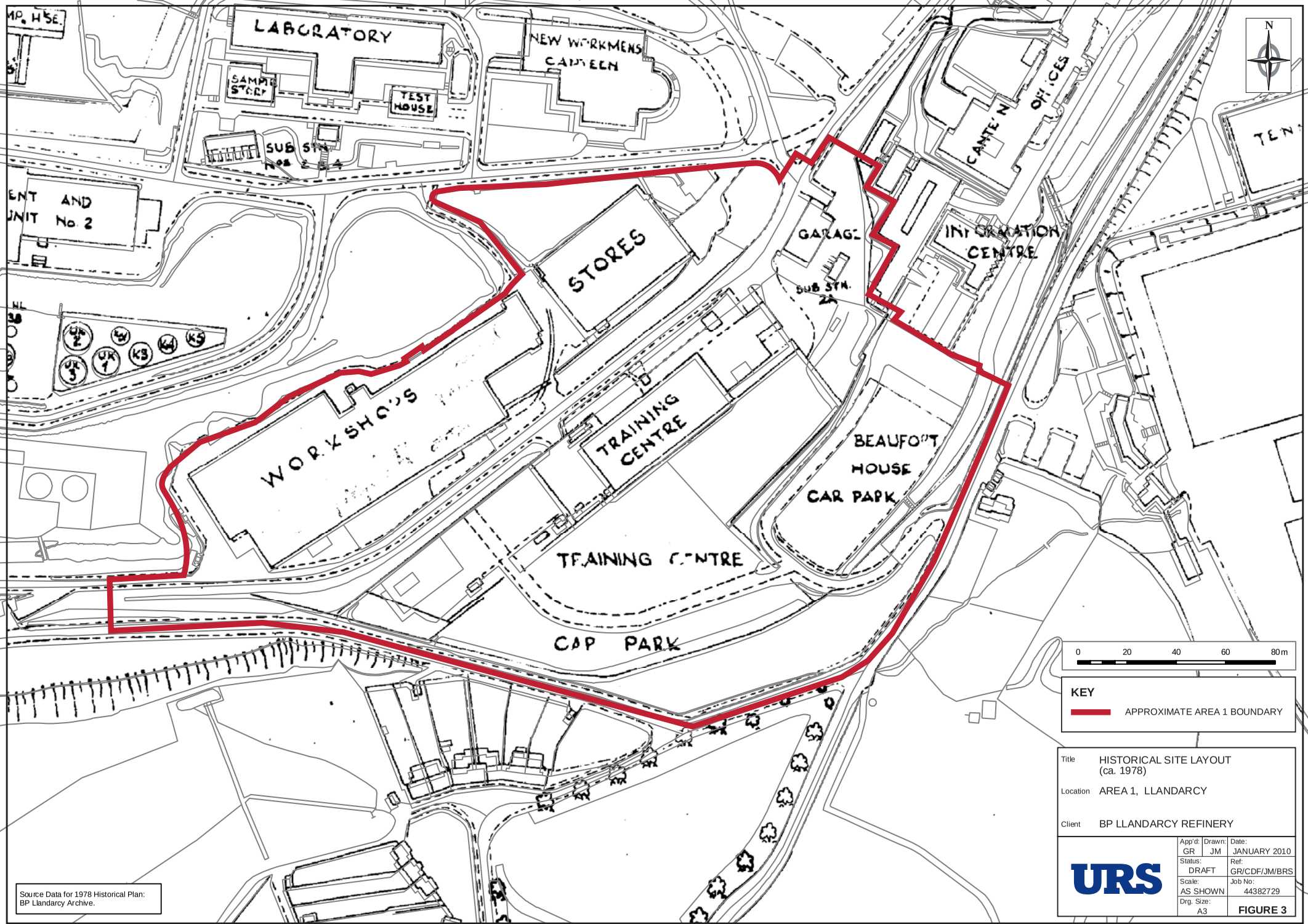



| | |
|---|---|
| Title | SITE LAYOUT PLAN |
| Location | AREA 1, LLANDARCY |
| Client | BP LLANDARCY REFINERY |

URS

| App'd: | Drawn: | Date: |
|---|---|---|
| SC | LCH | JANUARY 2010 |
| Status: DRAFT | | Ref: SC/BRIS/LCH/BRS |
| Scale: AS SHOWN | | Job No: 44382729 |
| Drg. Size: A3 | | FIGURE 2 |

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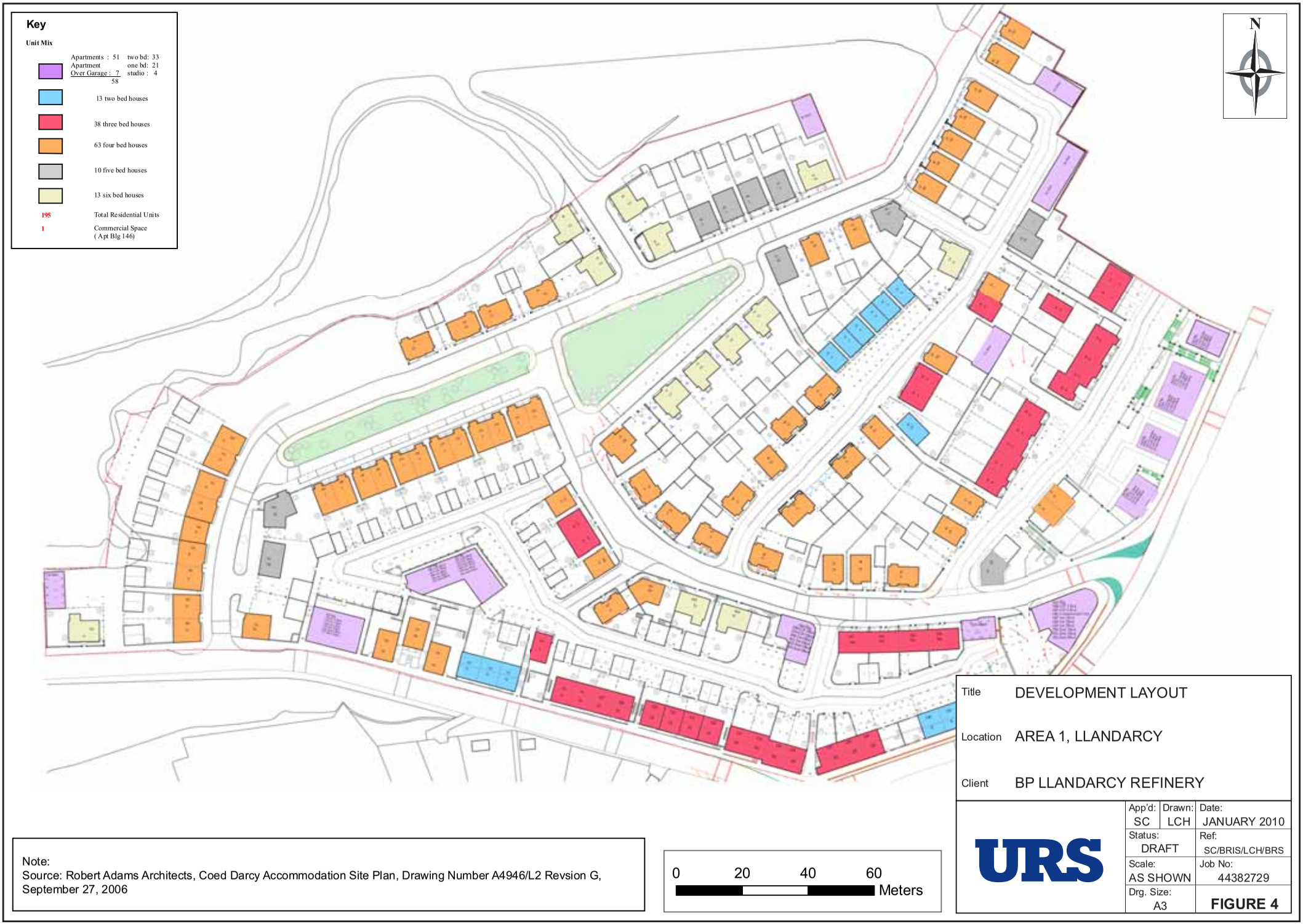



| | |
|---|---|
| Title | HISTORICAL SITE LAYOUT (ca. 1978) |
| Location | AREA 1, LLANDARCY |
| Client | BP LLANDARCY REFINERY |

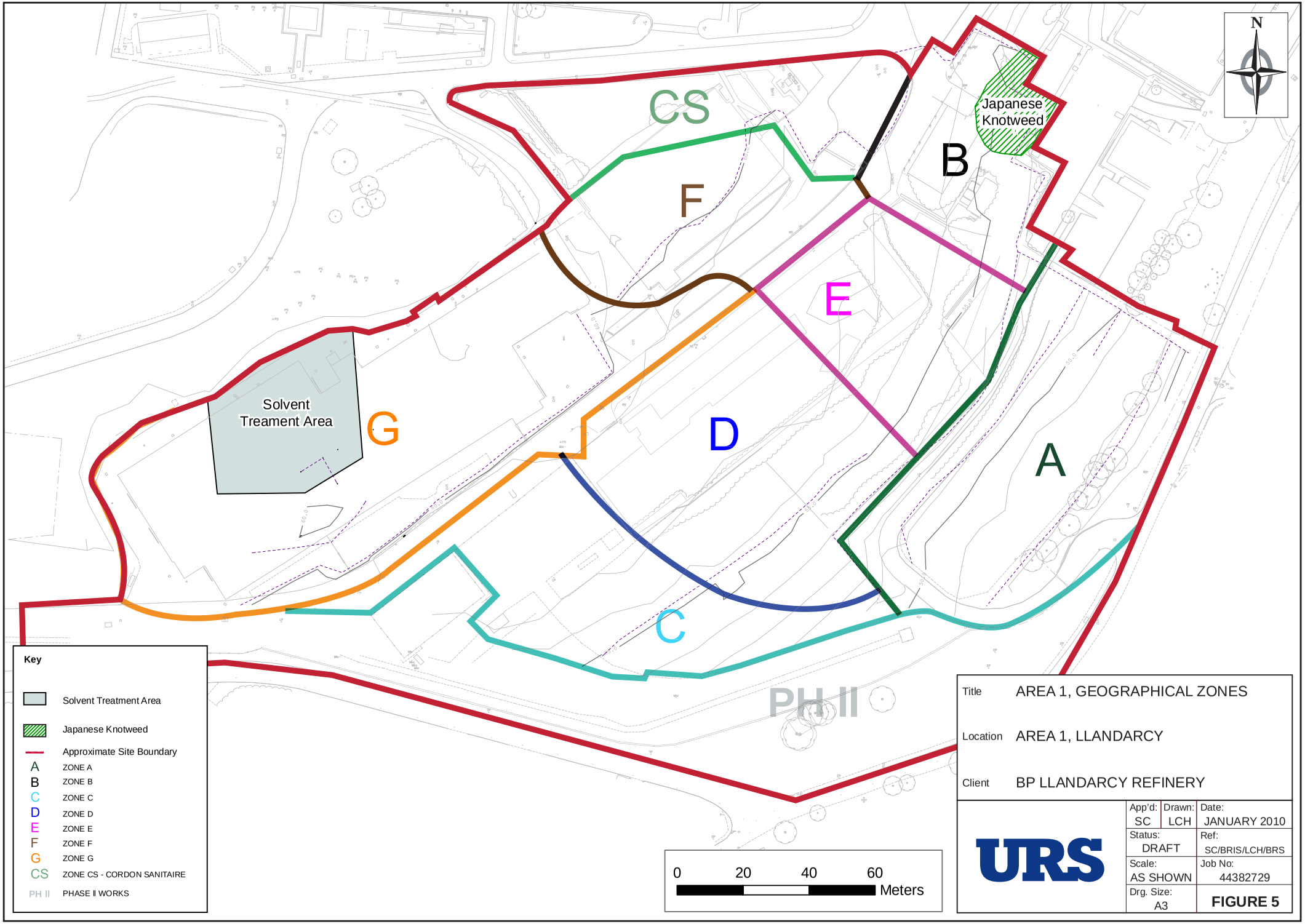
URS

| App'd: | Drawn: | Date: |
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| GR | JM | JANUARY 2010 |
| Status: DRAFT | | Ref: GR/CDF/JM/BRS |
| Scale: AS SHOWN | | Job No: 44382729 |
| Drg. Size: A3 | | FIGURE 3 |

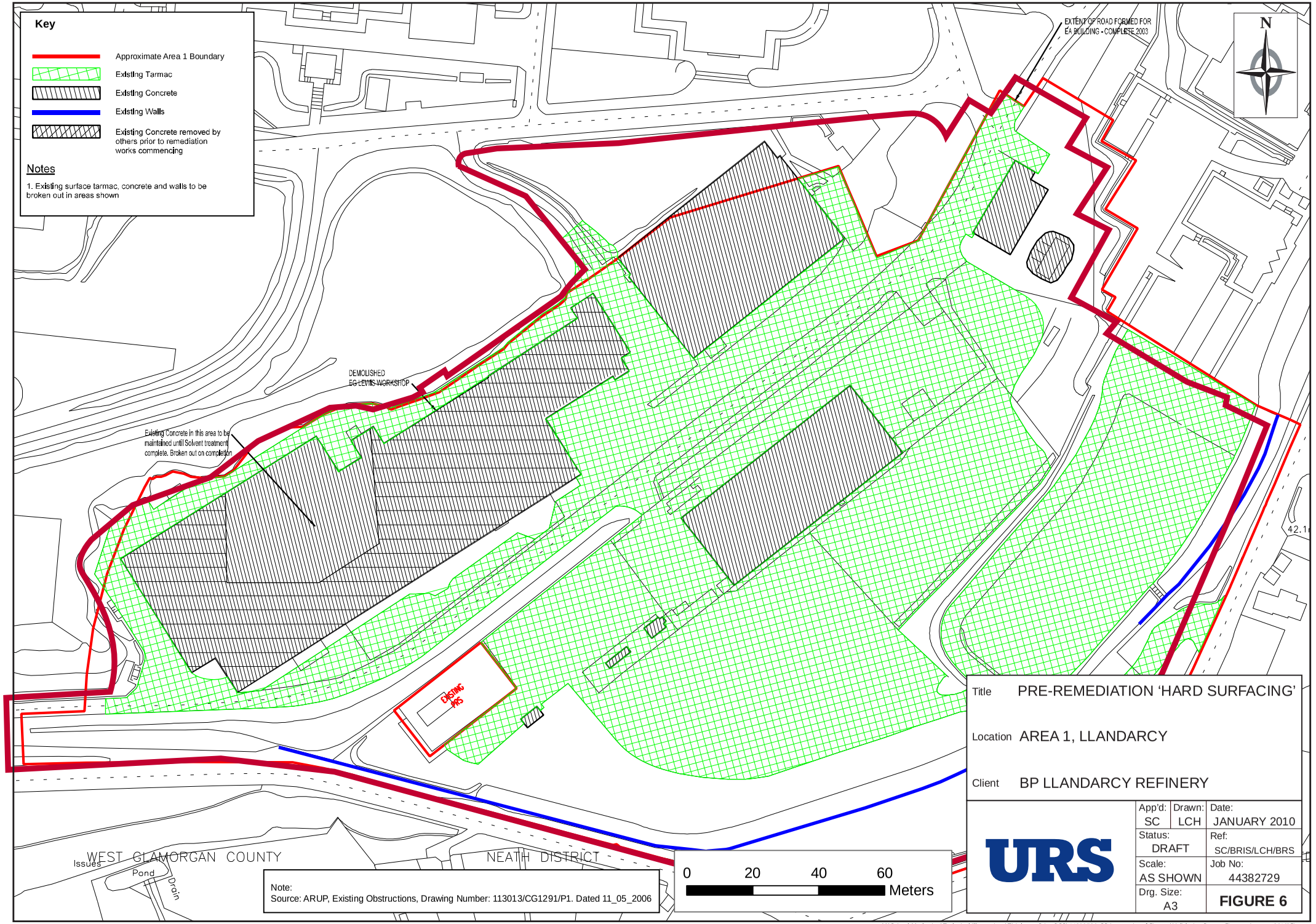
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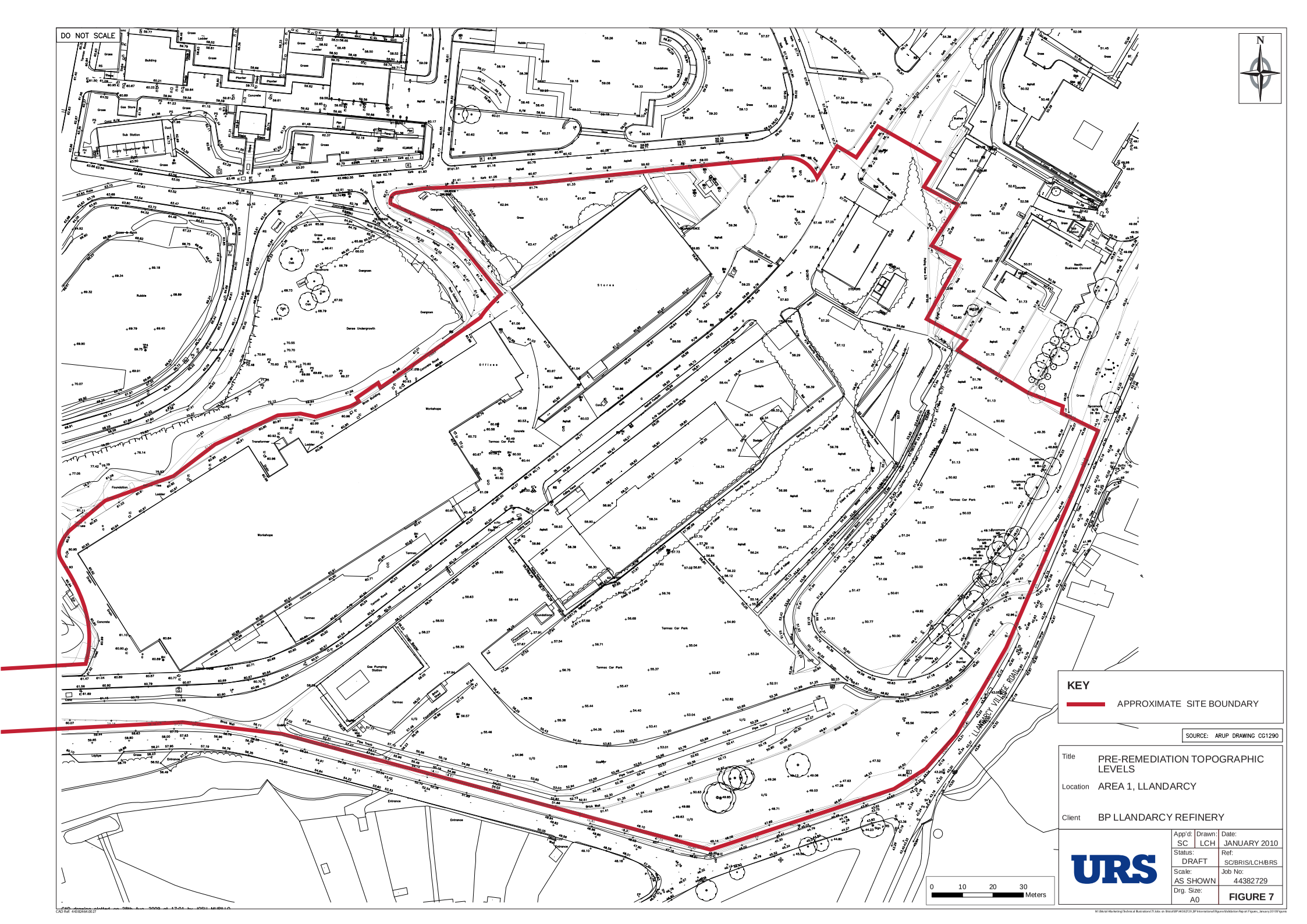

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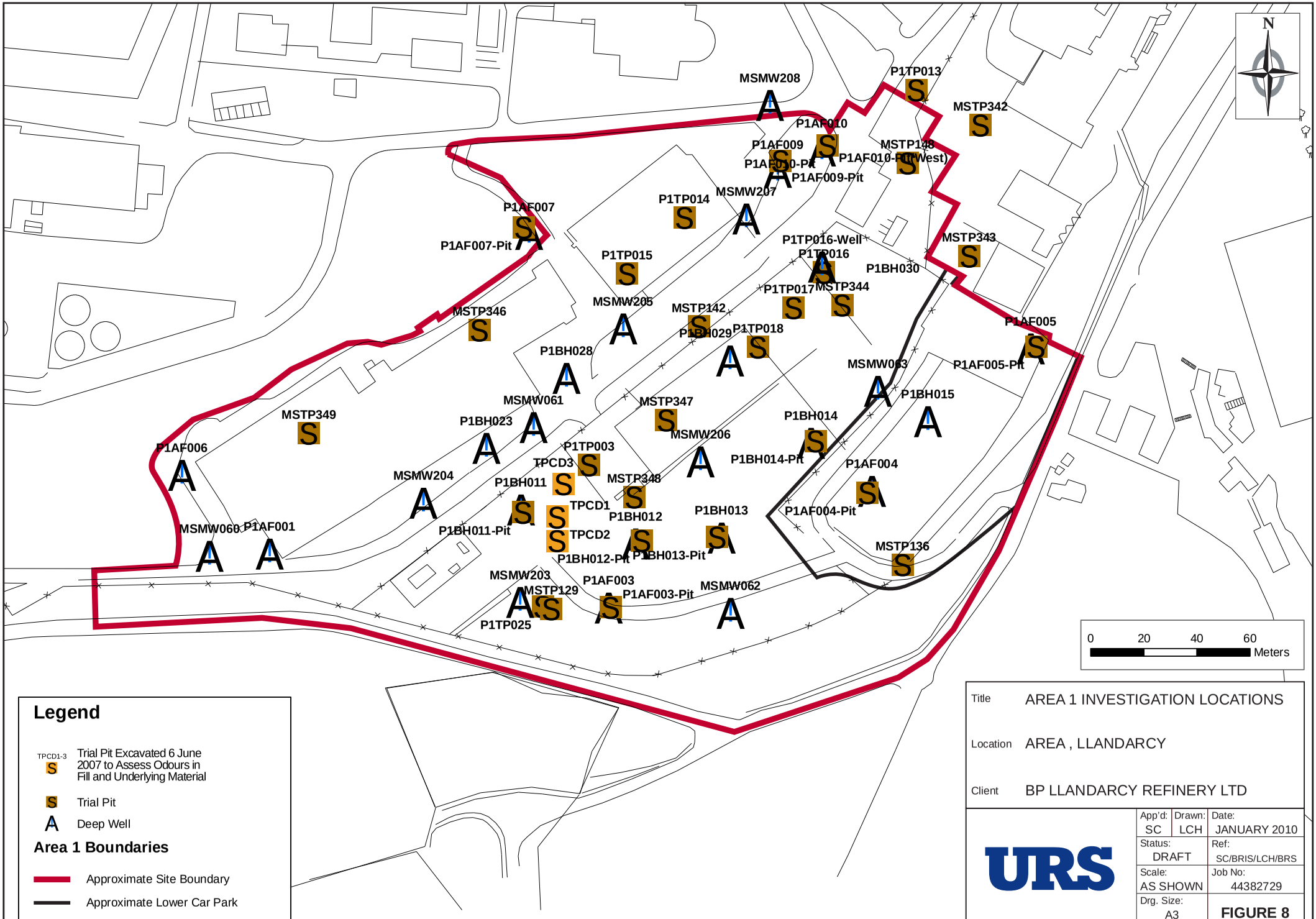



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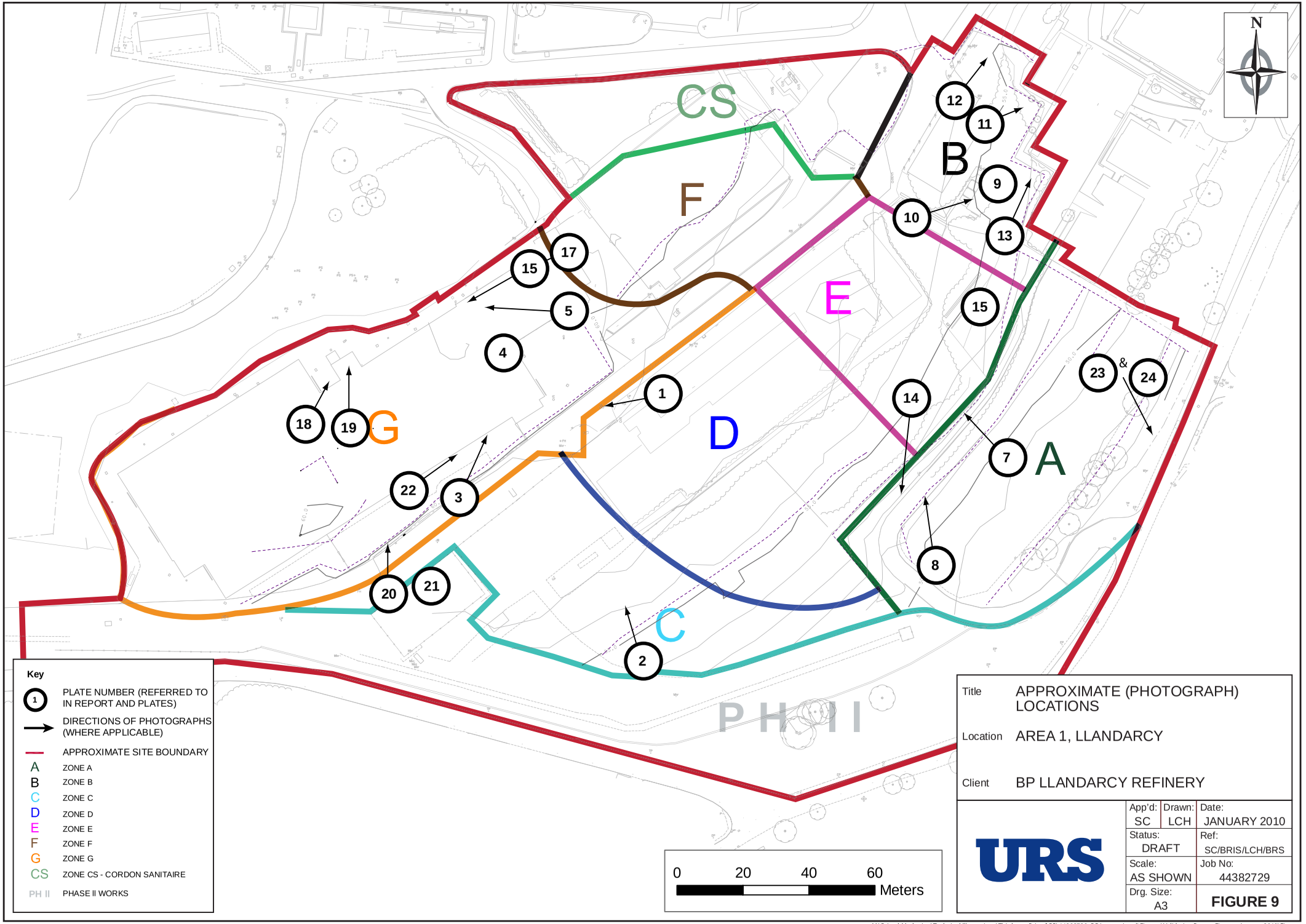



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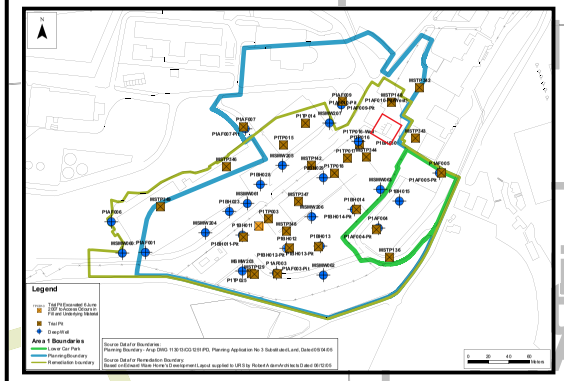

DO NOT SCALE
N
KEY
APPROXIMATE SITE BOUNDARY
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Location AREA 1, LLANDARCY
Client BP LLANDARCY REFINERY
URS
App'd: SC
Drawn: LCH
Date: JANUARY 2010
Status: DRAFT
Ref: SC/BRIS/LCH/BRS
Scale: AS SHOWN
Job No: 44382729
Drg. Size: A0
FIGURE 7
0 10 20 30 Meters
LLANDARCY VILLAGE ROAD




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MSTP148

P1AF010-Pit(West)

MSMW207

P1TP016-Wel

MSTP343

MSTP344

CPRE58

CPRE57

CPRE60

CPRE59

CPRE60

**KEY**

- **Approximate Boundary of Granular Fill Excavated in a Methodical Manner for PCB testing**
- CPRE ⊗ **Validation Sample Collected for PCB Analysis**
- **Approximate Transformer Area**
- **Approximate Lower Car Park Boundary**
- **Approximate Planning Boundary**
- **Approximate Remediation Boundary**
- **Trial Pit**
- **Deep Well**

Source Data for Boundaries:
Planning Boundary - Arup DWG 113013/CG1251/PD, Planning Application No 3 Substituted Land, Dated 05/04/05

Source Data for Remediation Boundary:
Based on Edward Ware Home's Development Layout supplied to URS by Robert Adam Architects Dated 06/12/05

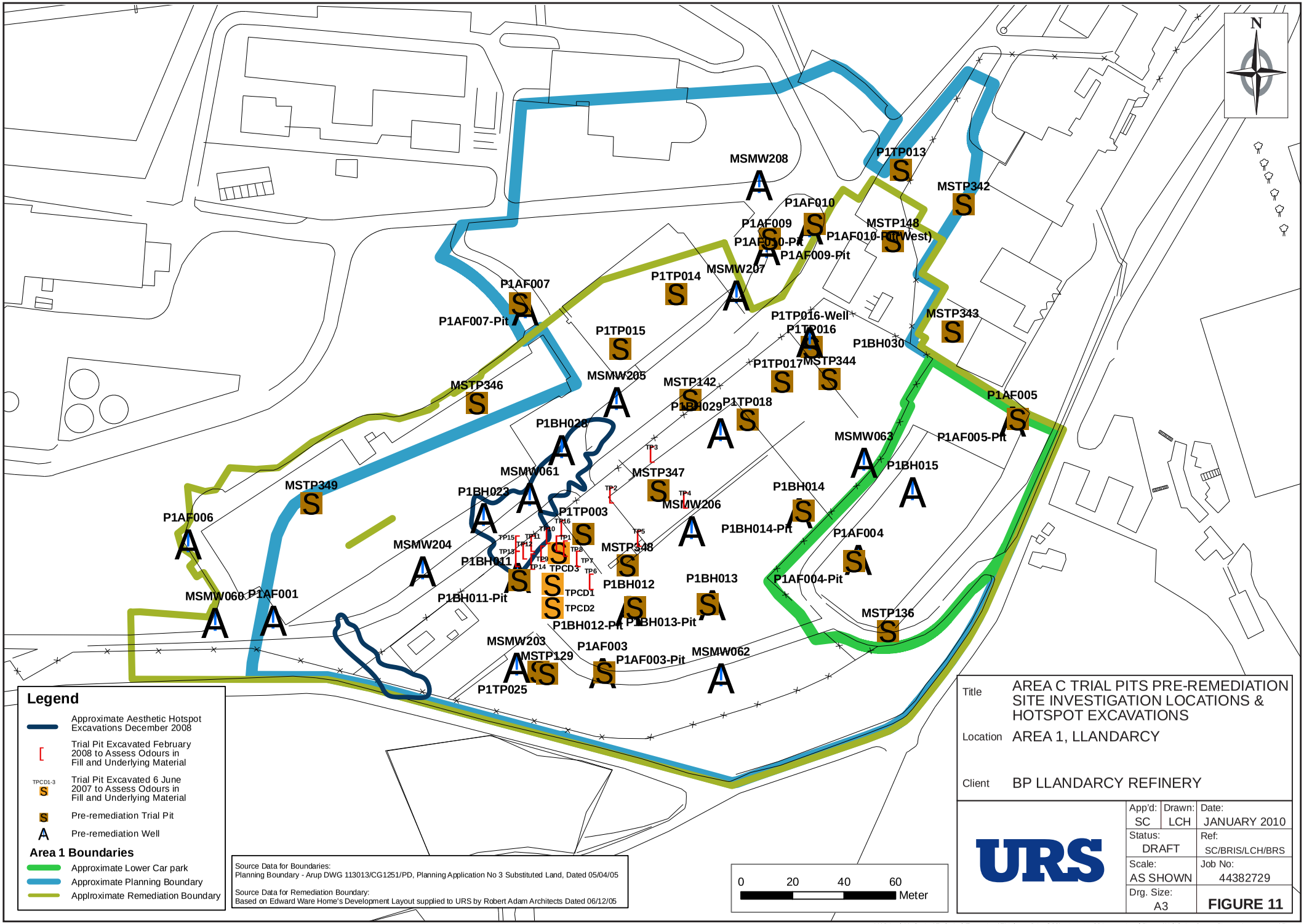
0 10 20 30 Meters

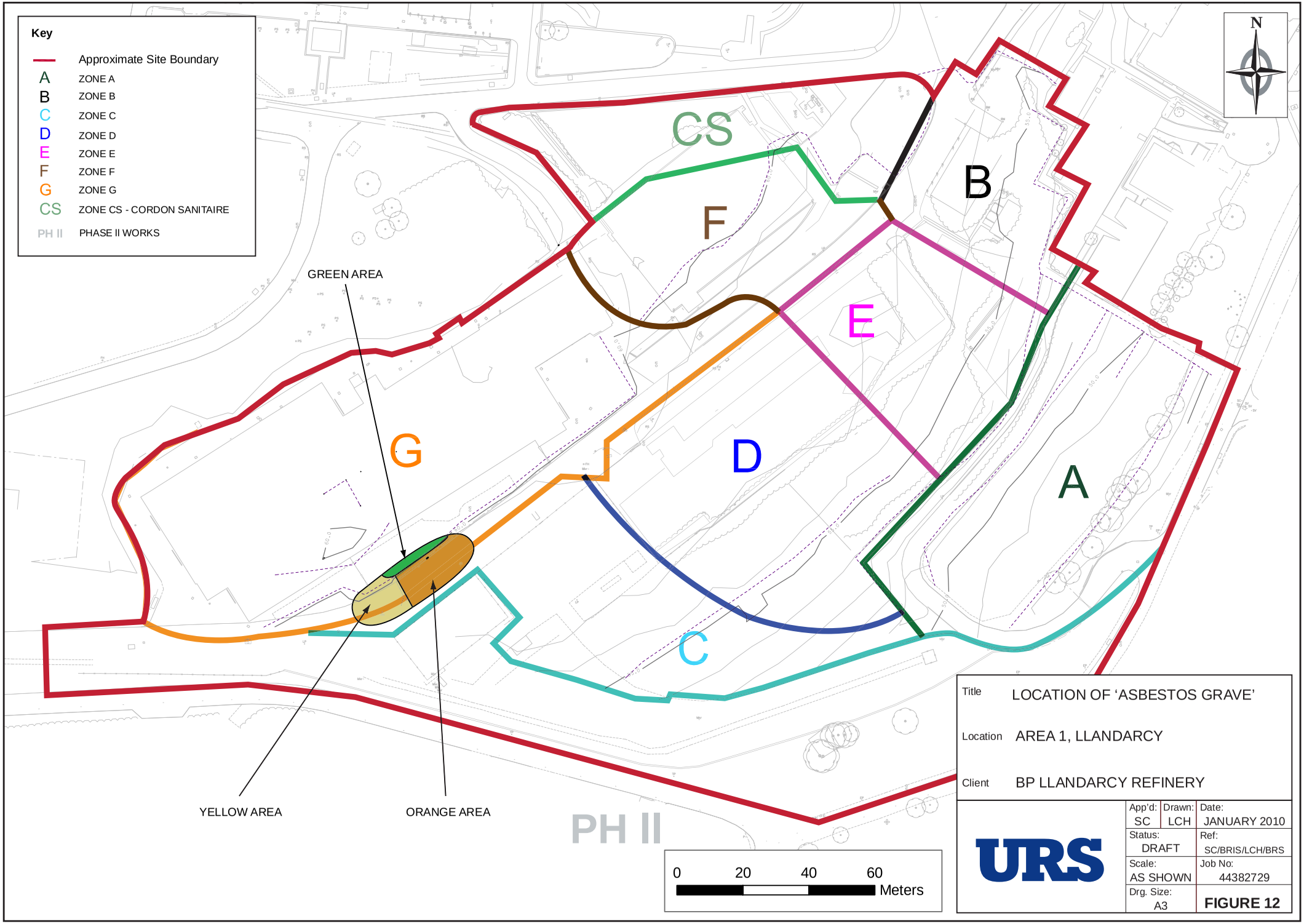
| | |
|---|---|
| Title | TRANSFORMER AREA DETAIL |
| Location | AREA 1, LLANDARCY |
| Client | BP LLANDARCY REFINERY |

URS

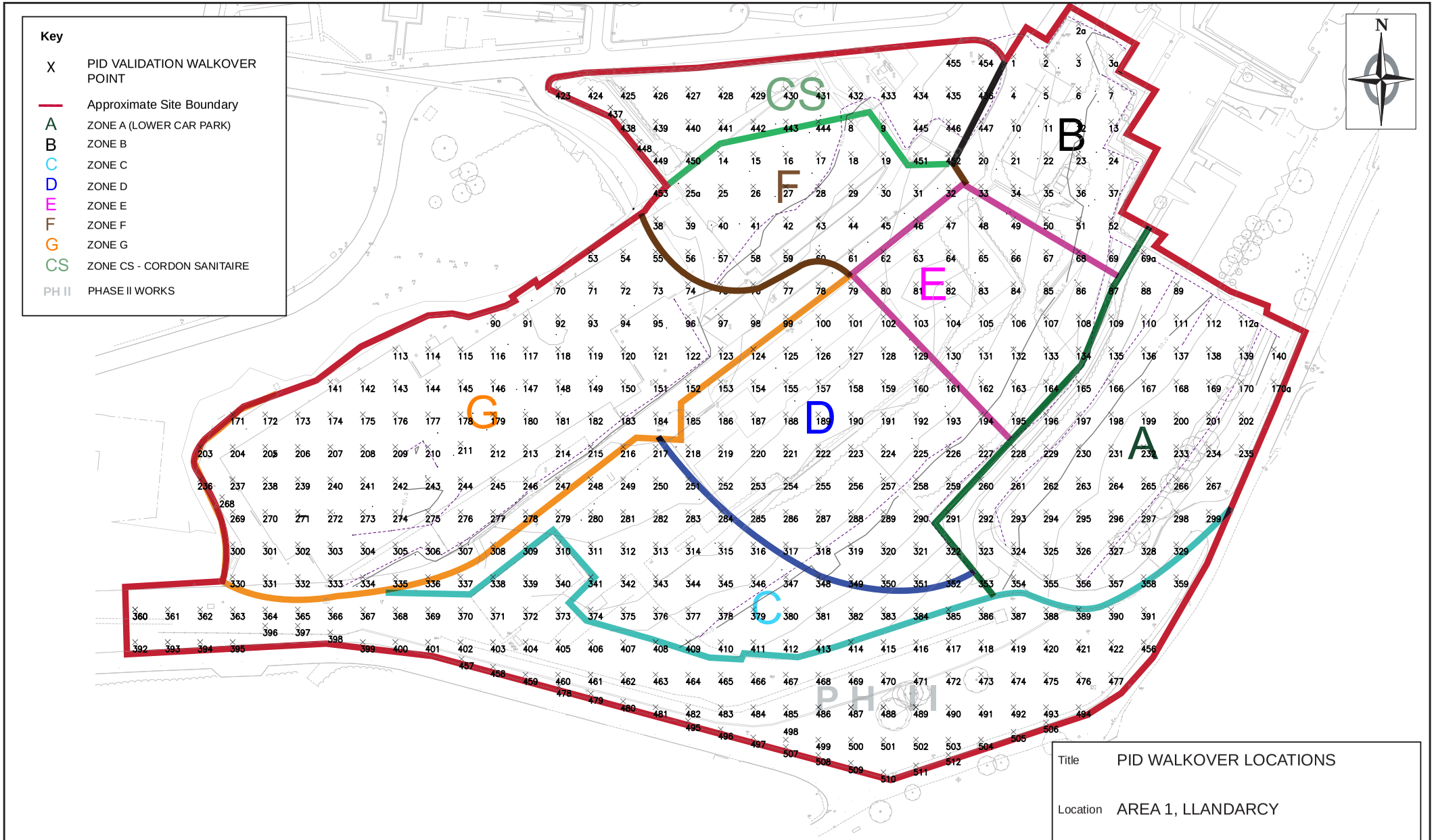
| | | |
|---|---|---|
| App'd: SC | Drawn: LCH | Date: JANUARY 2010 |
| Status: DRAFT | | Ref: SC/BRIS/LCH/BRS |
| Scale: AS SHOWN | | Job No: 44382729 |
| Drg. Size: A3 | | **FIGURE 10** |

M:\Bristol-Marketing\Technical Illustrations\TI Jobs on Bristol\BP\44382729_BP International\Figures\Validation Report Figures_January 2010\Figures


N
MSMW208
P1TP013
MSTP342
P1AF010
P1AF009
P1AF010-Pit
P1AF009-Pit
P1AF010-Pit(West)
MSTP148
MSMW207
P1TP014
P1AF007
P1AF007-Pit
P1TP016-Well
P1TP016
P1BH030
MSTP343
P1TP015
P1TP017
MSTP344
MSTP346
MSMW205
MSTP142
P1BH029
P1TP018
P1AF005
P1AF005-Pit
P1BH028
MSMW063
P1BH015
MSTP347
MSMW061
P1BH023
P1BH014
MSTP349
MSMW206
P1TP003
P1AF006
P1BH014-Pit
P1AF004
MSMW204
MSTP348
P1BH011
P1AF004-Pit
P1BH012
P1BH013
MSMW060
P1AF001
P1BH011-Pit
TPCD1
TPCD2
TPCD3
P1BH012-Pit
P1BH013-Pit
MSTP136
MSMW203
P1AF003
MSTP129
P1AF003-Pit
MSMW062
P1TP025
TP1
TP2
TP3
TP4
TP5
TP6
TP7
TP8
TP9
TP10
TP11
TP12
TP13
TP14
TP15
TP16
Legend
Approximate Aesthetic Hotspot Excavations December 2008
Trial Pit Excavated February 2008 to Assess Odours in Fill and Underlying Material
TPCD1-3
Trial Pit Excavated 6 June 2007 to Assess Odours in Fill and Underlying Material
Pre-remediation Trial Pit
Pre-remediation Well
Area 1 Boundaries
Approximate Lower Car park
Approximate Planning Boundary
Approximate Remediation Boundary
Source Data for Boundaries:
Planning Boundary - Arup DWG 113013/CG1251/PD, Planning Application No 3 Substituted Land, Dated 05/04/05
Source Data for Remediation Boundary:
Based on Edward Ware Home's Development Layout supplied to URS by Robert Adam Architects Dated 06/12/05
0
20
40
60
Meter
Title
AREA C TRIAL PITS PRE-REMEDIATION SITE INVESTIGATION LOCATIONS & HOTSPOT EXCAVATIONS
Location
AREA 1, LLANDARCY
Client
BP LLANDARCY REFINERY
URS
App'd: SC
Drawn: LCH
Date: JANUARY 2010
Status: DRAFT
Ref: SC/BRIS/LCH/BRS
Scale: AS SHOWN
Job No: 44382729
Drg. Size: A3
FIGURE 11
M:\Bristol-Marketing\Technical Illustrations\TI Jobs on Bristol\BP\44382729_BP International\Figures\Validation Report Figures_january 2010\Figures




M:\Bristol-Marketing\Technical Illustrations\TI Jobs on Bristol\BP\44382729_BP International\Figures\Validation Report Figures_January 2010\Figures

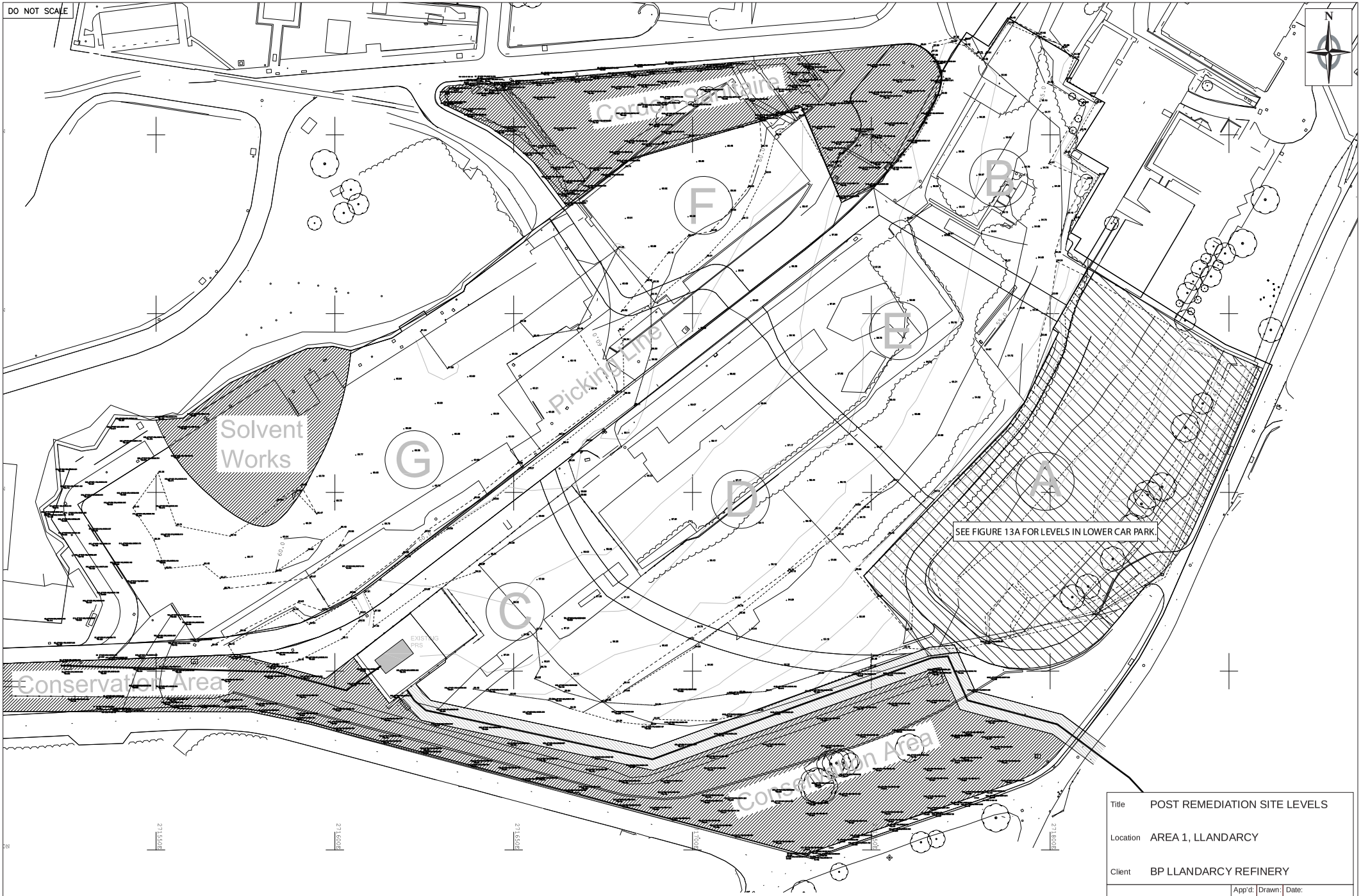



| | |
|---|---|
| Title | PID WALKOVER LOCATIONS |
| Location | AREA 1, LLANDARCY |
| Client | BP LLANDARCY REFINERY |

URS

| App'd: | Drawn: | Date: |
|---|---|---|
| SC | LCH | JANUARY 2010 |
| Status: DRAFT | | Ref: SC/BRIS/LCH/BRS |
| Scale: AS SHOWN | | Job No: 44382729 |
| Drg. Size: A3 | | **FIGURE 13** |

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Note:
Source:
-Churngold, As-Built Levels, Drawing Number 249/ELS291107/001 dated 29/11/2007.
-Dawnus Level Survey. File ref 'Area 1 Survey.dwg' e-mailed to URS on 26/11/2009.

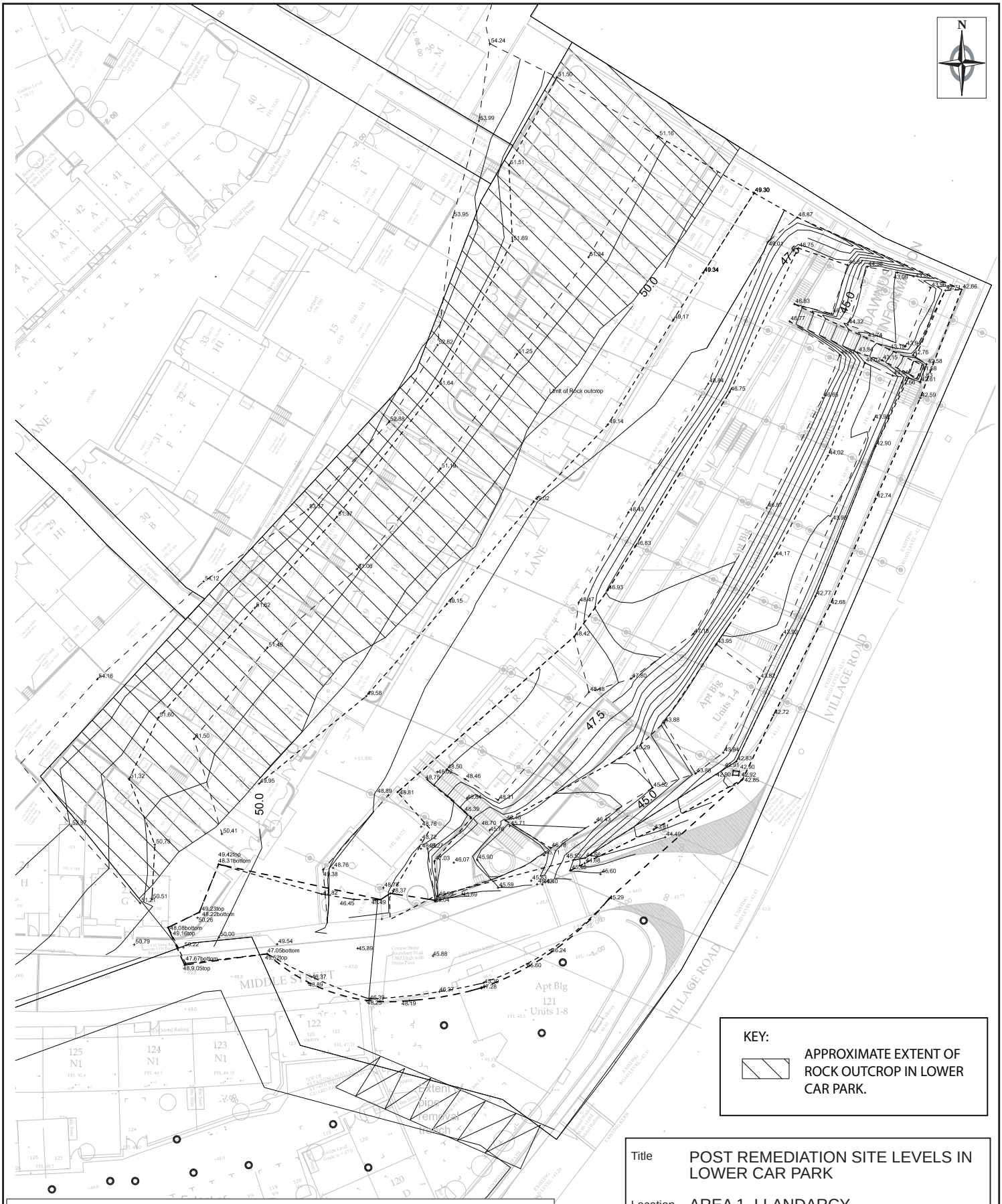
0 10 20 30 Meters

| | |
|---|---|
| Title | POST REMEDIATION SITE LEVELS |
| Location | AREA 1, LLANDARCY |
| Client | BP LLANDARCY REFINERY |

URS

| App'd: | Drawn: | Date: |
|---|---|---|
| SC | JM | JANUARY 2010 |
| Status: DRAFT | | Ref: SC/BRIS/JM/BRS |
| Scale: AS SHOWN | | Job No: 44382729 |
| Drg. Size: A0 | | **FIGURE 14** |

M:\Bristol-Marketing\Technical Illustration\TI Jobs on Bristol\BP\44382729_BP Llandarcy Refinery\Figures




Note:
Source: Churngold, As-Built Levels, Drawing Number 249/ABLA/0001 Rev A dated 22/02/2008 but issued to URS on 06/05/2008.
The surveys were carried out on 29/11/2007 and 22/02/2008, amended on 15/04/2008.

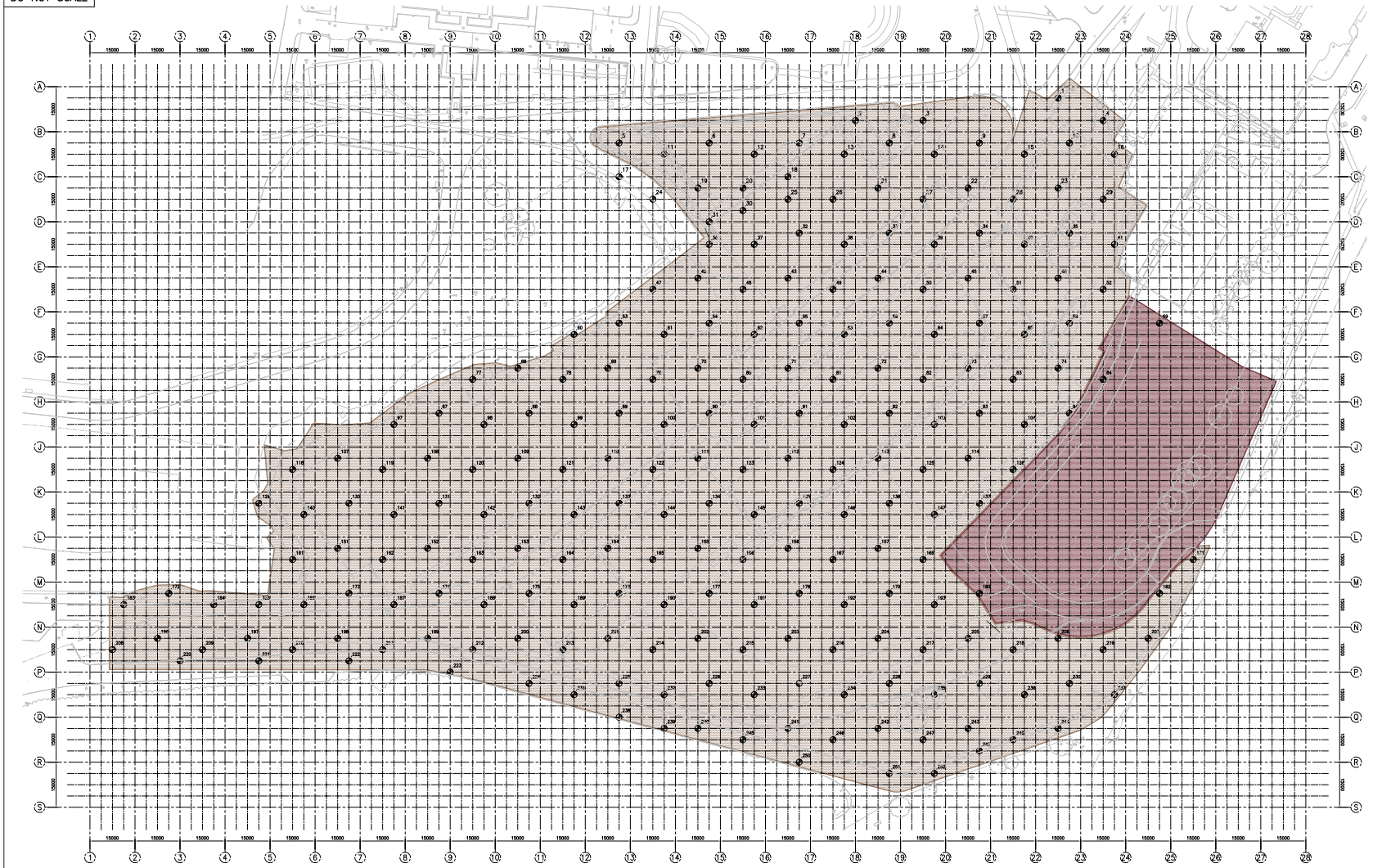
| | |
|---|---|
| Title | POST REMEDIATION SITE LEVELS IN LOWER CAR PARK |
| Location | AREA 1, LLANDARCY |
| Client | BP LLANDARCY REFINERY |

URS

| App'd: | Drawn: | Date: |
|---|---|---|
| SC | JM | JANUARY 2010 |
| Status: DRAFT | | Ref: SC/BRIS/JM/BRS |
| Scale: AS SHOWN | | Job No: 44382729 |
| Drg. Size: A3 | | **FIGURE 15** |

M:\Bristol-Marketing\Technical Illustrations\TI Jobs on Bristol\BP\44382729_BP Llandarcy Refinery\Figures

DO NOT SCALE



POINT SETOUT COORDINATES

| | | |
|---|---|---|
| 1 2717868E 195723064N | 51 2717718E 195685314N | 101 2716855E 195620314N |
| 2 2717783E 195721564N | 52 2718018E 195685314N | 102 2717155E 195620314N |
| 3 2717618E 195721564N | 53 2716455E 195685314N | 103 2717455E 195620314N |
| 4 2718018E 195721564N | 54 2716706E 195654064N | 104 2717755E 195620314N |
| 5 2716405E 195714064N | 55 2717705E 195654064N | 105 2718055E 195620314N |
| 6 2716705E 195714064N | 56 2717305E 195654064N | 106 2718355E 195620314N |
| 7 2717005E 195714064N | 57 2717605E 195654064N | 107 2715468E 195619064N |
| 8 2717305E 195714064N | 58 2717905E 195654064N | 108 2715768E 195619064N |
| 9 2717605E 195714064N | 59 2718205E 195654064N | 109 2716068E 195619064N |
| 10 2717905E 195714064N | 60 2716255E 195653314N | 110 2716368E 195619064N |
| 11 2716855E 195710314N | 61 2716555E 195653314N | 111 2716668E 195619064N |
| 12 2716855E 195710314N | 62 2716855E 195653314N | 112 2716968E 195619064N |
| 13 2717155E 195710314N | 63 2717155E 195653314N | 113 2717268E 195619064N |
| 14 2717455E 195710314N | 64 2717455E 195653314N | 114 2717568E 195619064N |
| 15 2717755E 195710314N | 65 2717755E 195653314N | 115 2717868E 195619064N |
| 16 2718055E 195710314N | 66 2718055E 195653314N | 116 2718168E 195619064N |
| 17 2716405E 195702814N | 67 2718318E 195653314N | 117 2718468E 195619064N |
| 18 2716855E 195702814N | 68 2716055E 195653314N | 118 2715318E 195615314N |
| 19 2716468E 195699064N | 69 2716368E 195639064N | 119 2715618E 195615314N |
| 20 2716818E 195699064N | 70 2716668E 195639064N | 120 2715918E 195615314N |
| 21 2717268E 195699064N | 71 2716968E 195639064N | 121 2716218E 195615314N |
| 22 2717568E 195699064N | 72 2717268E 195639064N | 122 2716518E 195615314N |
| 23 2717868E 195699064N | 73 2717568E 195639064N | 123 2716818E 195615314N |
| 24 2716855E 195695314N | 74 2717868E 195639064N | 124 2717118E 195615314N |
| 25 2716968E 195695314N | 75 2718168E 195639064N | 125 2717418E 195615314N |
| 26 2717118E 195695314N | 76 2715468E 195635314N | 126 2717718E 195615314N |
| 27 2717418E 195695314N | 77 2715918E 195635314N | 127 2718018E 195615314N |
| 28 2717718E 195695314N | 78 2716218E 195635314N | 128 2718318E 195615314N |
| 29 2716018E 195695314N | 79 2716518E 195635314N | 129 2715205E 195594064N |
| 30 2716818E 195695314N | 80 2716818E 195635314N | 130 2715505E 195594064N |
| 31 2716705E 195687814N | 81 2717118E 195635314N | 131 2715805E 195594064N |
| 32 2717105E 195684064N | 82 2717418E 195635314N | 132 2716105E 195594064N |
| 33 2717305E 195684064N | 83 2717718E 195635314N | 133 2716405E 195594064N |
| 34 2717505E 195684064N | 84 2718018E 195635314N | 134 2716705E 195594064N |
| 35 2717905E 195684064N | 85 2718318E 195635314N | 135 2717005E 195594064N |
| 36 2716705E 195680314N | 86 2718618E 195635314N | 136 2717305E 195594064N |
| 37 2716855E 195680314N | 87 2715855E 195624064N | 137 2717605E 195594064N |
| 38 2717155E 195680314N | 88 2716105E 195624064N | 138 2717905E 195594064N |
| 39 2717455E 195680314N | 89 2716405E 195624064N | 139 2718205E 195594064N |
| 40 2717755E 195680314N | 90 2716705E 195624064N | 140 2715355E 195590314N |
| 41 2718055E 195680314N | 91 2717005E 195624064N | 141 2715655E 195590314N |
| 42 2716468E 195680064N | 92 2717305E 195624064N | 142 2715955E 195590314N |
| 43 2716968E 195680064N | 93 2717605E 195624064N | 143 2716255E 195590314N |
| 44 2717268E 195680064N | 94 2717905E 195624064N | 144 2716555E 195590314N |
| 45 2717568E 195680064N | 95 2718205E 195624064N | 145 2716855E 195590314N |
| 46 2717868E 195680064N | 96 2715855E 195624064N | 146 2717155E 195590314N |
| 47 2716818E 195680064N | 97 2715955E 195620314N | 147 2717455E 195590314N |
| 48 2716818E 195680314N | 98 2715955E 195620314N | 148 2717755E 195590314N |
| 49 2717118E 195680314N | 99 2716055E 195620314N | 149 2718055E 195590314N |
| 50 2717418E 195680314N | 100 2716555E 195620314N | 150 2718355E 195590314N |

| | | |
|---|---|---|
| 151 2715468E 195579064N | 201 2716368E 195549064N | |
| 152 2715768E 195579064N | 202 2716668E 195549064N | |
| 153 2716068E 195579064N | 203 2716968E 195549064N | |
| 154 2716368E 195579064N | 204 2717268E 195549064N | |
| 155 2716668E 195579064N | 205 2717568E 195549064N | |
| 156 2716968E 195579064N | 206 2717868E 195549064N | |
| 157 2717268E 195579064N | 207 2718018E 195549064N | |
| 158 2717568E 195579064N | 208 2714718E 195545314N | |
| 159 2717868E 195579064N | 209 2715018E 195545314N | |
| 160 2718018E 195579064N | 210 2715318E 195545314N | |
| 161 2715318E 195575314N | 211 2715618E 195545314N | |
| 162 2715618E 195575314N | 212 2715918E 195545314N | |
| 163 2715918E 195575314N | 213 2716218E 195545314N | |
| 164 2716218E 195575314N | 214 2716518E 195545314N | |
| 165 2716518E 195575314N | 215 2716818E 195545314N | |
| 166 2716818E 195575314N | 216 2717118E 195545314N | |
| 167 2717118E 195575314N | 217 2717418E 195545314N | |
| 168 2717418E 195575314N | 218 2717718E 195545314N | |
| 169 2717718E 195575314N | 219 2718018E 195545314N | |
| 170 2718018E 195575314N | 220 2714968E 195541564N | |
| 171 2715318E 195575314N | 221 2715205E 195541564N | |
| 172 2714905E 195564064N | 222 2715505E 195541564N | |
| 173 2715505E 195564064N | 223 2715843E 195537814N | |
| 174 2715805E 195564064N | 224 2716105E 195536064N | |
| 175 2716105E 195564064N | 225 2716405E 195536064N | |
| 176 2716405E 195564064N | 226 2716705E 195536064N | |
| 177 2716705E 195564064N | 227 2717005E 195536064N | |
| 178 2717005E 195564064N | 228 2717305E 195536064N | |
| 179 2717305E 195564064N | 229 2717605E 195536064N | |
| 180 2717605E 195564064N | 230 2717905E 195536064N | |
| 181 2717905E 195564064N | 231 2716255E 195535314N | |
| 182 2718205E 195564064N | 232 2716555E 195535314N | |
| 183 2714705E 195560314N | 233 2716855E 195535314N | |
| 184 2715005E 195560314N | 234 2717155E 195535314N | |
| 185 2715205E 195560314N | 235 2717455E 195535314N | |
| 186 2715505E 195560314N | 236 2717755E 195535314N | |
| 187 2715855E 195560314N | 237 2718055E 195535314N | |
| 188 2715955E 195560314N | 238 2716405E 195528814N | |
| 189 2716255E 195560314N | 239 2716555E 195519064N | |
| 190 2716555E 195560314N | 240 2716668E 195519064N | |
| 191 2716855E 195560314N | 241 2716968E 195519064N | |
| 192 2717155E 195560314N | 242 2717268E 195519064N | |
| 193 2717455E 195560314N | 243 2717568E 195519064N | |
| 194 2717755E 195560314N | 244 2717868E 195519064N | |
| 195 2718055E 195560314N | 245 2716818E 195515314N | |
| 196 2714968E 195554064N | 246 2717118E 195515314N | |
| 197 2715318E 195554064N | 247 2717418E 195515314N | |
| 198 2715468E 195554064N | 248 2717718E 195515314N | |
| 199 2715768E 195554064N | 249 2716755E 195511564N | |
| 200 2716068E 195554064N | 250 2717005E 195507814N | |
| | 251 2717305E 195504064N | |
| | 252 2717455E 195504064N | |

## Key

1. REMEDIATION BOUNDARY BASED ON ROBERT ADAMS ARCHITECTS DRAWING RECEIVED BY E-MAIL ON 11.09.06
2. VALIDATION SAMPLING AND TESTING TO BE IN ACCORDANCE WITH PROTOCOLS SET IN PERFORMANCE SPECIFICATION FOR REMEDIATION CONTRACT, 44382624, ISSUE 2 FINAL DATED 27.7.06.
3. CONTRACTOR TO NOTIFY AND AGREE SUPERVISOR IN ADVANCE IF ANY LOCATIONS ARE TO BE ALTERED FROM THOSE SHOWN.
4. CONTRACTOR TO PROVIDE SURVEY CO-ORDINATES FOR ACTUAL LOCATIONS SAMPLED.

LOWER CAR PARK - VALIDATION TRIAL PITTING NOT REQUIRED.

VALIDATION AREA.

TRIAL PITS.

0 15 30 45 Meters

Title VALIDATION SAMPLE - SETTING OUT

Location AREA 1, LLANDARCY

Client BP LLANDARCY REFINERY

URS

| App'd: | Drawn: | Date: |
|---|---|---|
| SC | LCH | JANUARY 2010 |
| Status: DRAFT | | Ref: SC/BRIS/LCH/BRS |
| Scale: AS SHOWN | | Job No: 44382729 |
| Drg. Size: A0 | | FIGURE 16 |

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DO NOT SCALE




NOTES

DEVELOPMENT LEVELS AND LAYOUT ARE AS PROVIDED TO URS BY ROBERT ADAM ARCHITECTS ON 24/01/2008.

| NO | DESCRIPTION | DRWN | APPROVED | DATE |
|---|---|---|---|---|

STATUS

INFORMATION

CONSULTING ENGINEERS

URS

COMPANY HOUSE, TOWER HILL, BRISTOL. BS2 0EQ.
TEL 01173-178500 FAX 01173-178549

CLIENT
BP LLANDARCY

PROJECT
AREA 1
LLANDARCY REFINERY

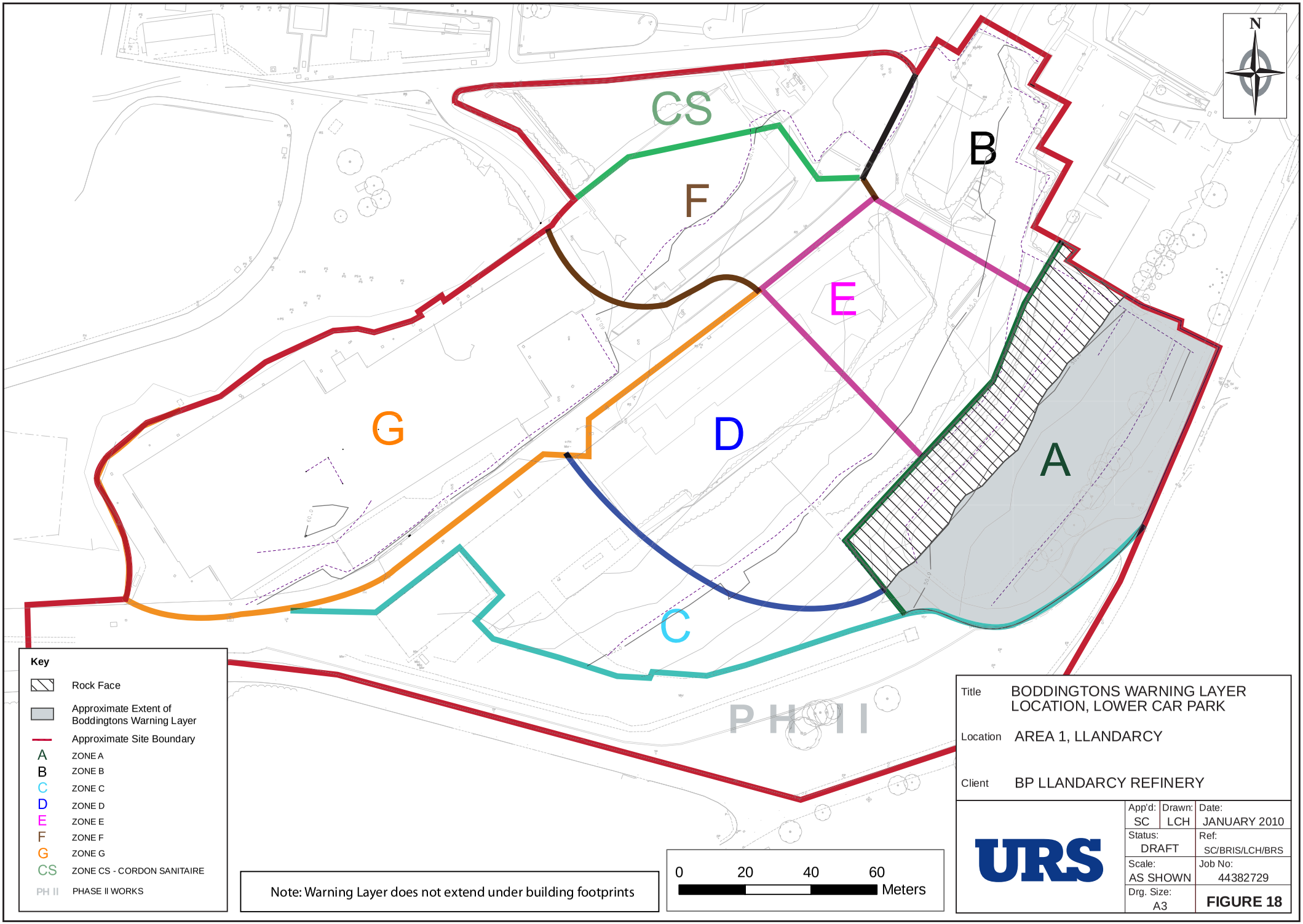
DRAWING TITLE
FIGURE 15
PROPOSED DEVELOPMENT LEVELS

| DRAWN | TRACED | CHECKED | APPROVED | DATE |
|---|---|---|---|---|
| JM | | CE | CE | 28.08.09 |

| SCALE | DRG No. | REV. |
|---|---|---|
| 1:500 | 44382624/0017 | |

ORIGINAL DRAWING A0

CAD drawing plotted on 7th Sep. 2009 at 14:24 by JOSU_MURILLO




Title: BODDINGTONS WARNING LAYER LOCATION, LOWER CAR PARK

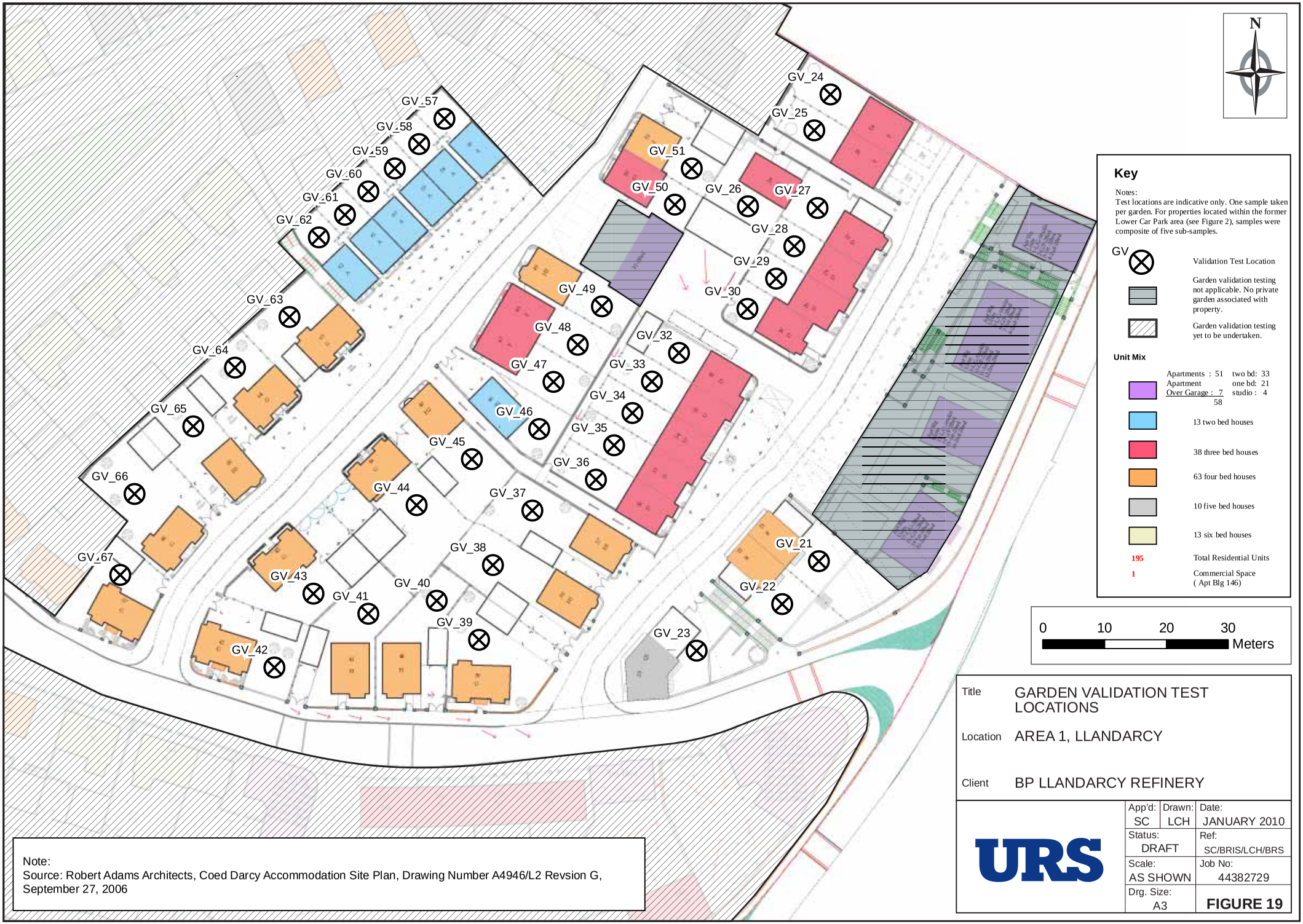
Location: AREA 1, LLANDARCY

Client: BP LLANDARCY REFINERY

URS

| App'd: | Drawn: | Date: |
|---|---|---|
| SC | LCH | JANUARY 2010 |
| Status: DRAFT | | Ref: SC/BRIS/LCH/BRS |
| Scale: AS SHOWN | | Job No: 44382729 |
| Drg. Size: A3 | | **FIGURE 18** |

M:\Bristol-Marketing\Technical Illustrations\TI Jobs on Bristol\BP\44382729_BP International\Figures\Validation Report Figures_January 2010\Figures




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# Tables

**TABLE 1**
**Summary of Results from Transformer Area**

| Date taken | Sample name | Summary | Analysed By | Concentration (µg/kg) |
|---|---|---|---|---|
| 08/02/2007 | Trans1 | Initial sample of black material from transformer | Alcontrol | Identified as asphalt bitumen with 24,000µg/kg PCBs as Aroclor 1254 |
| 09/03/2007 | CP_UK7_AA22 | Black material from bank in Lower Car Park | Alcontrol | <50 (STL) , <2000 (Alcontrol) |
| 09/03/2007 | CP_UK8_AF14 | Soil sample from area ~5-7m from transformer within Area B | STL | 420 |
| 09/03/2007 | CP_UK8_AG22 | Material from trial pit in the Lower Car Park | Alcontrol | <2000 |
| 09/03/2007 | CP_UK9 | Assumed to be from cable in vicinity of transformer | Alcontrol | <2000 |
| 09/03/2007 | CP_UK10 | Material from transformer | Alcontrol | <2000 |
| 09/03/2007 | CP_UK11 | Material from area of the cable/transformer, but unrelated | Alcontrol | <2000 |
| 19/03/2007 | CP_UK13 | 3rd sample of material from the transformer | Alcontrol | 3000 |
| 19/03/2007 | CP_UK14 | Soil from area around the transformer | Alcontrol | <1000 |
| 19/03/2007 | CP_UK15 | Soil sample from area ~5-7m from transformer within Area B | Alcontrol | <100 |
| 19/03/2007 | CP_UK16 | Soil from area around the transformer | STL | <57 |
| 19/03/2007 | CP_UK17 | Soil sample from area ~5-7m from transformer within Area B | STL | 380 |
| 09/03/2007 | CP_P22_D1_a | Sample from stockpile 1 | STL | <50 |
| 09/03/2007 | CP_S25_D3_a | Sample from stockpile 2 | STL | <50 |
| 09/03/2007 | CP_Q21_D5_a | Sample from stockpile 3 | STL | <50 |
| 09/03/2007 | CP_S23_D7_a | Sample from stockpile 4 | STL | <50 |
| 09/03/2007 | CP_R22_D9_a | Sample from stockpile 5 | STL | <50 |
| 09/03/2007 | CP_S24_D11_a | Sample from stockpile 6 | STL | <50 |
| 09/03/2007 | CP_T24_D12_a | Sample from stockpile 7 | STL | <50 |
| 13/11/2007 | CPRE56 | Validation sample for soils beneath former transformer area following remedial excavation | STL | <1.1 |
| 13/11/2007 | CPRE57 | | STL | <1.1 |
| 13/11/2007 | CPRE58 | | STL | <1.1 |
| 13/11/2007 | CPRE59 | | STL | <1.1 |
| 13/11/2007 | CPRE60 | | STL | <1.1 |

**TABLE 2**
**Photo Ionisation Detector (PID) Validation**

| PID Location Reference | Area | Easting | Northing | Description | Observations | PID (ppm) | Comments |
|---|---|---|---|---|---|---|---|
| 1 | B | 271775 | 195725 | firm brown clay | NVO | 0.0 | |
| 2 | B | 271785 | 195725 | silty brown clay | NVO | 0.0 | |
| 3 | B | 271795 | 195725 | firm brown clay | NVO | 0.0 | |
| 4 | B | 271775 | 195715 | dark brown gravelly clay with pieces of rock | NVO | 0.5 | |
| 5 | B | 271785 | 195715 | medium firm brown clay | NVO | 0.0 | |
| 6 | B | 271795 | 195715 | firm brown clay | NVO | 0.0 | |
| 7 | B | 271805 | 195715 | medium firm brown clay | NVO | 0.4 | |
| 8 | F | 271725 | 195705 | brown gravelly clay with rocks | NVO | 4.0 | |
| 9 | B | 271765 | 195705 | brown clay | NVO | 0.0 | |
| 10 | B | 271775 | 195705 | dark brown clay | NVO | 0.2 | |
| 11 | B | 271785 | 195705 | brown clay | NVO | 0.4 | |
| 12 | B | 271795 | 195705 | brown clay | NVO | 0.2 | |
| 13 | B | 271805 | 195705 | brown clay | NVO | 0.2 | |
| 14 | F | 271685 | 195695 | gravel on rock | NVO | 0.0 | |
| 15 | F | 271695 | 195695 | gravel on rock | NVO | 0.1 | |
| 16 | F | 271705 | 195695 | clay and gravel on rock | NVO | 0.1 | |
| 17 | F | 271715 | 195695 | clay and gravel on rock | NVO | 0.3 | |
| 18 | F | 271725 | 195695 | clay on rock | NVO | 0.3 | |
| 19 | F | 271735 | 195695 | clay | NVO | 0.4 | |
| 20 | B | 271765 | 195695 | brown clay | NVO | 0.2 | |
| 21 | B | 271775 | 195695 | brown clay | NVO | 0.4 | |
| 22 | B | 271785 | 195695 | brown clay | NVO | 0.3 | |
| 23 | B | 271795 | 195695 | soft brown clay | NVO | 0.5 | |
| 24 | B | 271805 | 195695 | soft brown clay | NVO | 0.1 | |
| 25 | F | 271685 | 195685 | concrete, gravel, brick | NVO | 0.0 | |
| 26 | F | 271695 | 195685 | gravelly clay on rock | NVO | 0.0 | |
| 27 | F | 271705 | 195685 | clay on rock | NVO | 0.1 | |
| 28 | F | 271715 | 195685 | gravelly clay, some ash and slate | NVO | 0.0 | |
| 29 | F | 271725 | 195685 | clay | NVO | 0.2 | |
| 30 | F | 271735 | 195685 | clay next to water | NVO | 0.1 | |
| 31 | F | 271745 | 195685 | clay | NVO | 0.1 | |
| 32 | B | 271755 | 195685 | brown clay | NVO | 0.0 | |
| 33 | B | 271765 | 195685 | brown clay | NVO | 0.4 | |
| 34 | B | 271775 | 195685 | brown clay | NVO | 0.7 | |
| 35 | B | 271785 | 195685 | brown clay | NVO | 0.8 | |
| 36 | B | 271795 | 195685 | brown clay | NVO | 1.1 | |
| 37 | B | 271805 | 195685 | brown clay | NVO | 0.4 | |
| 38 | F | 271665 | 195675 | clay on rock | NVO | 0.0 | |
| 39 | F | 271675 | 195675 | rock fragments with gravel | NVO | 0.0 | |
| 40 | F | 271685 | 195675 | gravel and clay on rock | NVO | 0.0 | |
| 41 | F | 271695 | 195675 | gravel and clay on rock | NVO | 0.0 | |
| 42 | F | 271705 | 195675 | clay | NVO | 0.0 | |
| 43 | F | 271715 | 195675 | clay | NVO | 0.0 | |
| 44 | F | 271725 | 195675 | clay | NVO | 0.0 | |
| 45 | F | 271735 | 195675 | clay | NVO | 0.0 | |
| 46 | E | 271745 | 195675 | clay | NVO | 0.0 | |
| 47 | E | 271755 | 195675 | clay on rock | NVO | 0.6 | |
| 48 | E | 271765 | 195675 | clay | NVO | 1.5 | |
| 49 | B | 271775 | 195675 | brown slightly gravelly clay | NVO | 1.0 | |
| 50 | B | 271785 | 195675 | brown clay with cobbles | NVO | 0.2 | |
| 51 | B | 271795 | 195675 | clay with cobbles | NVO | 0.5 | |
| 52 | B | 271805 | 195675 | clay with cobbles | NVO | 0.5 | |
| 53 | G | 271645 | 195665 | Edge of cliff | NVO | 0.0 | |
| 54 | G | 271655 | 195665 | imported gravel over rock | NVO | 1.3 | |
| 55 | G | 271665 | 195665 | clay on rock | NVO | 0.5 | |
| 56 | F | 271675 | 195665 | rock at surface | NVO | 0.0 | |
| 57 | F | 271685 | 195665 | gravel on rock | NVO | 1.5 | |
| 58 | F | 271695 | 195665 | clay on rock | NVO | 0.0 | |
| 59 | F | 271705 | 195665 | clay | NVO | 0.1 | |
| 60 | F | 271715 | 195665 | clay | NVO | 1.0 | |
| 61 | F | 271725 | 195665 | clay | NVO | 0.1 | |
| 62 | E | 271735 | 195665 | clay | NVO | 0.2 | |
| 63 | E | 271745 | 195665 | clay and gravel | NVO | 0.1 | |
| 64 | E | 271755 | 195665 | clay and gravel | NVO | 0.3 | |
| 65 | E | 271765 | 195665 | clay | NVO | 0.2 | |
| 66 | E | 271775 | 195665 | clay | NVO | 0.2 | |
| 67 | E | 271785 | 195665 | clay and gravel | NVO | 0.3 | |
| 68 | B | 271795 | 195665 | brown clay | NVO | 1.9 | |
| 69 | B | 271805 | 195665 | dark brown clay | NVO | 0.7 | |
| 70 | G | 271635 | 195655 | within cliff | NVO | - | |
| 71 | G | 271645 | 195655 | gravel on rock | NVO | 0.9 | |
| 72 | G | 271655 | 195655 | gravel on rock | NVO | 1.1 | |
| 73 | G | 271665 | 195655 | gravel and clay | NVO | 1.3 | |
| 74 | F | 271675 | 195655 | clay gravel and rock | NVO | 0.8 | |
| 75 | F | 271685 | 195655 | clay and gravel | NVO | 0.0 | |
| 76 | F | 271695 | 195655 | clay | NVO | 0.3 | |
| 77 | F | 271705 | 195655 | clay and gravel | NVO | 0.2 | |
| 78 | F | 271715 | 195655 | clay | NVO | 0.6 | |
| 79 | E | 271725 | 195655 | clay | NVO | 0.9 | |
| 80 | E | 271735 | 195655 | clay and gravel | NVO | 0.6 | |
| 81 | E | 271745 | 195655 | clay and ash on rock | NVO | 0.5 | |
| 82 | E | 271755 | 195655 | gravelly clay | NVO | 0.3 | |
| 83 | E | 271765 | 195655 | clay on rock | NVO | 1.1 | |
| 84 | E | 271775 | 195655 | clay on rock | NVO | 1.4 | |
| 85 | E | 271785 | 195655 | clay on rock | NVO | 1.1 | |
| 86 | E | 271795 | 195655 | brown clay | NVO | 0.0 | |
| 87 | B | 271805 | 195655 | brown gravelly clay | NVO | 0.2 | |
| 88 | A | 271815 | 195655 | rock, no sample | NVO | - | |
| 89 | A | 271825 | 195655 | brown gravelly clay | NVO | 0.0 | |
| 90 | G | 271615 | 195645 | gravelly clay | NVO | 0.1 | |
| 91 | G | 271625 | 195645 | edge of cliff - soil | NVO | 0.1 | |
| 92 | G | 271635 | 195645 | gravel and clay | NVO | 0.0 | |
| 93 | G | 271645 | 195645 | gravel on rock | NVO | 1.0 | |
| 94 | G | 271655 | 195645 | clay and rock | NVO | 0.8 | |
| 95 | G | 271665 | 195645 | clay | NVO | 0.3 | |
| 96 | F | 271675 | 195645 | clay | NVO | 0.7 | |

**TABLE 2**
**Photo Ionisation Detector (PID) Validation**

| PID Location Reference | Area | Easting | Northing | Description | Observations | PID (ppm) | Comments |
|---|---|---|---|---|---|---|---|
| 97 | G | 271685 | 195645 | clay and gravel | NVO | 1.3 | |
| 98 | G | 271695 | 195645 | clay | NVO | 0.0 | |
| 99 | G | 271705 | 195645 | clay | NVO | 0.0 | |
| 100 | D | 271715 | 195645 | clay | NVO | 0.1 | |
| 101 | E | 271725 | 195645 | clay on rock | NVO | 0.2 | |
| 102 | E | 271735 | 195645 | rock, no sample | NVO | - | |
| 103 | E | 271745 | 195645 | clay and gravel on rock | NVO | 0.0 | |
| 104 | E | 271755 | 195645 | clay on rock | NVO | 0.1 | |
| 105 | E | 271765 | 195645 | rock, no sample | NVO | - | |
| 106 | E | 271775 | 195645 | clay on rock | NVO | 0.2 | |
| 107 | E | 271785 | 195645 | clay on rock | NVO | 0.2 | |
| 108 | E | 271795 | 195645 | brown gravelly clay | NVO | 0.0 | |
| 109 | A | 271805 | 195645 | rock, no sample | NVO | - | |
| 110 | A | 271815 | 195645 | brown gravelly clay on rock | NVO | 0.2 | |
| 111 | A | 271825 | 195645 | brown gravelly clay | NVO | 0.0 | |
| 112 | A | 271835 | 195645 | brown gravelly clay | NVO | 0.0 | |
| 113 | G | 271585 | 195635 | gravelly clay | NVO | 0.2 | |
| 114 | G | 271595 | 195635 | clay on rock | NVO | 1.1 | |
| 115 | G | 271605 | 195635 | gravelly clay over rock | NVO | 0.5 | |
| 116 | G | 271615 | 195635 | clay on rock | NVO | 1.2 | |
| 117 | G | 271625 | 195635 | clay on rock | NVO | 9.3 | |
| 118 | G | 271635 | 195635 | clay and gravel | NVO | 0.1 | |
| 119 | G | 271645 | 195635 | clay on rock | NVO | 1.2 | |
| 120 | G | 271655 | 195635 | clay on rock | NVO | 0.1 | |
| 121 | G | 271665 | 195635 | clay and gravel | NVO | 0.4 | |
| 122 | G | 271675 | 195635 | clay on rock | NVO | 0.0 | |
| 123 | G | 271685 | 195635 | clay on rock | NVO | 0.0 | |
| 124 | G | 271695 | 195635 | clay on rock | NVO | 0.0 | |
| 125 | D | 271705 | 195635 | gravel | NVO | 0.4 | |
| 126 | D | 271715 | 195635 | rock, no sample | NVO | - | |
| 127 | D | 271725 | 195635 | gravelly clay | NVO | 0.0 | |
| 128 | E | 271735 | 195635 | gravelly clay | NVO | 0.0 | |
| 129 | E | 271745 | 195635 | clay | NVO | 0.0 | |
| 130 | E | 271755 | 195635 | clay on rock | NVO | 0.0 | |
| 131 | E | 271765 | 195635 | clay on rock | NVO | 0.4 | |
| 132 | E | 271775 | 195635 | On rock, no sample | NVO | - | |
| 133 | E | 271785 | 195635 | brown clay | NVO | 0.2 | |
| 134 | E | 271795 | 195635 | brown gravelly clay | NVO | 0.0 | |
| 135 | A | 271805 | 195635 | brown gravelly clay over rock | NVO | 0.2 | |
| 136 | A | 271815 | 195635 | brown gravelly clay on rock | NVO | 0.1 | |
| 137 | A | 271825 | 195635 | brown gravelly clay | NVO | 0.0 | |
| 138 | A | 271835 | 195635 | brown clay | NVO | 0.0 | |
| 139 | A | 271845 | 195635 | brown gravelly clay | NVO | 4.2 | |
| 140 | A | 271855 | 195635 | on bank | NVO | 2.4 | |
| 141 | G | 271565 | 195625 | gravelly clay | NVO | 0.0 | |
| 142 | G | 271575 | 195625 | gravelly clay | NVO | 0.0 | |
| 143 | G | 271585 | 195625 | gravelly clay | NVO | 0.3 | |
| 144 | G | 271595 | 195625 | clay on rock | NVO | 0.1 | |
| 145 | G | 271605 | 195625 | standing water over rock | NVO | 3.1 | |
| 146 | G | 271615 | 195625 | clay | NVO | 3.0 | |
| 147 | G | 271625 | 195625 | clay on rock | NVO | 0.4 | |
| 148 | G | 271635 | 195625 | clay | NVO | 0.1 | |
| 149 | G | 271645 | 195625 | clay on rock | NVO | 0.0 | |
| 150 | G | 271655 | 195625 | clay on rock | NVO | 0.0 | |
| 151 | G | 271665 | 195625 | clay on rock | NVO | 0.0 | |
| 152 | G | 271675 | 195625 | gravelly clay | NVO | 0.0 | |
| 153 | G | 271685 | 195625 | gravelly clay | NVO | 0.0 | |
| 154 | D | 271695 | 195625 | gravelly clay | NVO | 0.0 | |
| 155 | D | 271705 | 195625 | clay | NVO | 0.0 | |
| 156 | No number 156 in error | | | | | | |
| 157 | D | 271715 | 195625 | clay | NVO | 0.0 | |
| 158 | D | 271725 | 195625 | clay on rock | NVO | 0.0 | |
| 159 | D | 271735 | 195625 | gravelly clay on rock | NVO | 0.2 | |
| 160 | E | 271745 | 195625 | gravelly clay | NVO | 0.0 | |
| 161 | E | 271755 | 195625 | clay | NVO | 0.1 | |
| 162 | E | 271765 | 195625 | brown clay, on rock | NVO | 0.0 | |
| 163 | E | 271775 | 195625 | brown clay | NVO | 0.0 | |
| 164 | E | 271785 | 195625 | brown clay | NVO | 0.1 | |
| 165 | E | 271795 | 195625 | brown clay | NVO | 0.0 | |
| 166 | A | 271805 | 195625 | brown gravelly clay over rock | NVO | 0.0 | |
| 167 | A | 271815 | 195625 | brown gravelly clay | NVO | 0.0 | |
| 168 | A | 271825 | 195625 | brown gravelly clay | NVO | 0.0 | |
| 169 | A | 271835 | 195625 | brown gravelly clay | NVO | 0.0 | |
| 170 | A | 271845 | 195625 | brown gravelly sand | NVO | 0.1 | |
| 171 | G | 271535 | 195615 | rock - no sample | NVO | - | |
| 172 | G | 271545 | 195615 | rock - no sample | NVO | - | |
| 173 | G | 271555 | 195615 | gravelly clay on rock | NVO | 0.0 | |
| 174 | G | 271565 | 195615 | gravelly clay | NVO | 0.0 | |
| 175 | G | 271575 | 195615 | gravelly clay | NVO | 0.0 | |
| 176 | G | 271585 | 195615 | gravelly clay | NVO | 0.1 | |
| 177 | G | 271595 | 195615 | clay on rock | NVO | 1.0 | |
| 178 | G | 271605 | 195615 | clay and gravel | NVO | 4.2 | |
| 179 | G | 271615 | 195615 | gravelly clay | NVO | 1.9 | |
| 180 | G | 271625 | 195615 | clay | NVO | 1.8 | |
| 181 | G | 271635 | 195615 | clay | NVO | 0.0 | |
| 182 | G | 271645 | 195615 | clay | NVO | 0.0 | |
| 183 | G | 271655 | 195615 | clay | NVO | 20.2 | Area removed |
| 184 | G | 271665 | 195615 | clay | odour | 116.0 | |
| 185 | D | 271675 | 195615 | clay | NVO | 16.1 | |
| 186 | D | 271685 | 195615 | clay and gravel | NVO | 1.5 | |
| 187 | D | 271695 | 195615 | puddle of water - no sample | NVO | - | |
| 188 | D | 271705 | 195615 | On rock, no sample | NVO | - | |
| 189 | D | 271715 | 195615 | clay on rock | NVO | 0.3 | |
| 190 | D | 271725 | 195615 | clay on rock | NVO | 0.0 | |
| 191 | D | 271735 | 195615 | clay on rock | NVO | 1.2 | |
| 192 | D | 271745 | 195615 | gravel on rock | NVO | 0.4 | |

**TABLE 2**
**Photo Ionisation Detector (PID) Validation**

| PID Location Reference | Area | Easting | Northing | Description | Observations | PID (ppm) | Comments |
|---|---|---|---|---|---|---|---|
| 193 | E | 271755 | 195615 | gravel on rock | NVO | 0.8 | |
| 194 | E | 271765 | 195615 | brown clay, on rock | NVO | 0.6 | |
| 195 | E | 271775 | 195615 | brown gravelly clay | NVO | 0.6 | |
| 196 | E | 271785 | 195615 | brown gravelly clay | NVO | 0.2 | |
| 197 | A | 271795 | 195615 | brown gravelly clay with rock pieces | NVO | 0.0 | |
| 198 | A | 271805 | 195615 | brown gravelly clay | NVO | 0.0 | |
| 199 | A | 271815 | 195615 | brown clay + black ash | NVO | 0.0 | |
| 200 | A | 271825 | 195615 | brown gravelly clay on rock | NVO | 0.4 | |
| 201 | A | 271835 | 195615 | brown gravelly clay | NVO | 0.0 | |
| 202 | A | 271845 | 195615 | brown sand | NVO | 4.2 | |
| 203 | G | 271525 | 195605 | rock and clay | NVO | 0.0 | |
| 204 | G | 271535 | 195605 | gravelly clay | NVO | 0.0 | |
| 205 | G | 271545 | 195605 | gravelly clay | NVO | 0.0 | |
| 206 | G | 271555 | 195605 | gravelly clay | NVO | 0.0 | |
| 207 | G | 271565 | 195605 | gravelly clay | NVO | 0.0 | |
| 208 | G | 271575 | 195605 | rock - no sample | - | - | |
| 209 | G | 271585 | 195605 | gravelly clay | NVO | 0.8 | |
| 210 | G | 271595 | 195605 | gravelly clay | NVO | 3.0 | |
| 211 | G | 271605 | 195606 | gravelly clay | NVO | 2.0 | |
| 212 | G | 271615 | 195605 | clay/gravel | NVO | 1.4 | |
| 213 | G | 271625 | 195605 | clay on rock | NVO | 2.2 | |
| 214 | G | 271635 | 195605 | clay and gravel | NVO | 0.0 | |
| 215 | G | 271645 | 195605 | clay | NVO | 0.0 | |
| 216 | G | 271655 | 195605 | gravelly clay | NVO | 6.5 | |
| 217 | G | 271665 | 195605 | brown sandy gravel | NVO | 23.4 | Area removed |
| 218 | D | 271675 | 195605 | gravelly clay | NVO | 0.3 | |
| 219 | D | 271685 | 195605 | gravelly clay on rock | NVO | 0.5 | |
| 220 | D | 271695 | 195605 | clay on rock | NVO | 0.7 | |
| 221 | D | 271705 | 195605 | clay on rock | NVO | 0.6 | |
| 222 | D | 271715 | 195605 | gravel on rock | NVO | 0.5 | |
| 223 | D | 271725 | 195605 | gravel on rock | NVO | 0.5 | |
| 224 | D | 271735 | 195605 | clay | NVO | 0.7 | |
| 225 | D | 271745 | 195605 | clay | NVO | 0.1 | |
| 226 | D | 271755 | 195605 | brown clay | NVO | 170.0 | Area removed |
| 227 | E | 271765 | 195605 | brown clay, on rock | NVO | 0.2 | |
| 228 | E | 271775 | 195605 | brown gravelly clay with rock pieces | NVO | 0.3 | |
| 229 | A | 271785 | 195605 | brown gravelly clay | NVO | 0.1 | |
| 230 | A | 271795 | 195605 | brown gravelly clay with rock pieces | NVO | 0.0 | |
| 231 | A | 271805 | 195605 | brown clay | NVO | 0.0 | |
| 232 | A | 271815 | 195605 | brown gravelly clay on rock | NVO | 0.2 | |
| 233 | A | 271825 | 195605 | brown sandy clay | NVO | 1.2 | |
| 234 | A | 271835 | 195605 | brown clay | NVO | 0.1 | |
| 235 | A | 271845 | 195605 | brown gravelly clay | NVO | 3.7 | |
| 236 | G | 271525 | 195595 | rock and clay | NVO | 0.0 | |
| 237 | G | 271535 | 195595 | gravelly clay | NVO | 0.0 | |
| 238 | G | 271545 | 195595 | rock | NVO | 0.0 | |
| 239 | G | 271555 | 195595 | gravelly clay | NVO | 0.0 | |
| 240 | G | 271565 | 195595 | gravelly clay | NVO | 0.0 | |
| 241 | G | 271575 | 195595 | clay on rock | NVO | 0.0 | |
| 242 | G | 271585 | 195595 | clay | NVO | 0.9 | |
| 243 | G | 271595 | 195595 | gravelly clay | NVO | 0.6 | |
| 244 | G | 271605 | 195595 | gravelly clay | NVO | 0.1 | |
| 245 | G | 271615 | 195595 | gravelly clay | NVO | 0.9 | |
| 246 | G | 271625 | 195595 | clay | NVO | 2.4 | |
| 247 | G | 271635 | 195595 | clay and gravel | NVO | 0.1 | |
| 248 | G | 271645 | 195595 | clay | NVO | 0.0 | |
| 249 | C | 271655 | 195595 | brown clay | NVO | 0.8 | |
| 250 | C | 271665 | 195595 | brown clay | NVO | 7.6 | |
| 251 | D | 271675 | 195595 | brown clay | NVO | 3.5 | |
| 252 | D | 271685 | 195595 | clay on rock | NVO | 0.4 | |
| 253 | D | 271695 | 195595 | clay on rock | NVO | 0.2 | |
| 254 | D | 271705 | 195595 | clay on rock | NVO | 0.5 | |
| 255 | D | 271715 | 195595 | clay | NVO | 0.4 | |
| 256 | D | 271725 | 195595 | clay | NVO | 0.3 | |
| 257 | D | 271735 | 195595 | brown clay | NVO | 1.5 | |
| 258 | D | 271745 | 195595 | brown gravelly clay | NVO | 0.8 | |
| 259 | D | 271755 | 195595 | brown gravelly clay | NVO | 0.0 | |
| 260 | D | 271765 | 195595 | brown clay | NVO | 0.5 | |
| 261 | A | 271775 | 195595 | brown gravelly clay with rock pieces | NVO | 0.2 | |
| 262 | A | 271785 | 195595 | brown gravelly clay | NVO | 0.1 | |
| 263 | A | 271795 | 195595 | brown clay | NVO | 0.0 | |
| 264 | A | 271805 | 195595 | brown gravel with stones | NVO | 0.3 | |
| 265 | A | 271815 | 195595 | brown gravelly clay | NVO | 0.4 | |
| 266 | A | 271825 | 195595 | brown sandy clay | NVO | 2.6 | |
| 267 | A | 271835 | 195595 | brown gravelly clay | NVO | 2.3 | |
| 268 | G | 271525 | 195585 | rock and clay | NVO | 0.0 | |
| 269 | G | 271535 | 195585 | gravelly clay | NVO | 0.0 | |
| 270 | G | 271545 | 195585 | on rock | NVO | 0.0 | |
| 271 | G | 271555 | 195585 | gravelly clay | NVO | 0.0 | |
| 272 | G | 271565 | 195585 | gravelly clay | NVO | 0.0 | |
| 273 | G | 271575 | 195585 | gravelly clay | NVO | 0.0 | |
| 274 | G | 271585 | 195585 | gravelly clay | NVO | 1.2 | |
| 275 | G | 271595 | 195585 | gravelly clay | NVO | 0.1 | |
| 276 | G | 271605 | 195585 | gravelly clay | NVO | 0.3 | |
| 277 | G | 271615 | 195585 | clay | NVO | 0.0 | |
| 278 | G | 271625 | 195585 | gravelly clay | NVO | 2.2 | |
| 279 | C | 271635 | 195585 | clay and gravel | NVO | 0.0 | |
| 280 | C | 271645 | 195585 | brown gravelly clay | NVO | 3.5 | |
| 281 | C | 271655 | 195585 | submerged | NVO | 0.6 | |
| 282 | C | 271665 | 195585 | brown silty clay | NVO | 0.7 | |
| 283 | D | 271675 | 195585 | brown clay | NVO | 2.5 | |
| 284 | D | 271685 | 195585 | gravelly clay on rock | NVO | 0.3 | |
| 285 | D | 271695 | 195585 | gravelly clay on rock | NVO | 0.3 | |
| 286 | D | 271705 | 195585 | clay | NVO | 0.4 | |
| 287 | D | 271715 | 195585 | clay | NVO | 0.5 | |
| 288 | D | 271725 | 195585 | gravelly clay | NVO | 0.4 | |

**TABLE 2**
**Photo Ionisation Detector (PID) Validation**

| PID Location Reference | Area | Easting | Northing | Description | Observations | PID (ppm) | Comments |
|---|---|---|---|---|---|---|---|
| 289 | D | 271735 | 195585 | brown clay | some black staining | 0.6 | Area removed |
| 290 | D | 271745 | 195585 | brown clay | NVO | 0.8 | |
| 291 | D | 271755 | 195585 | On rock, no sample | NVO | - | |
| 292 | A | 271765 | 195585 | dark brown clay, on rock | NVO | 0.1 | |
| 293 | A | 271775 | 195585 | brown gravelly clay | NVO | 0.2 | |
| 294 | A | 271785 | 195585 | brown gravelly clay | NVO | 0.1 | |
| 295 | A | 271795 | 195585 | brown clay | NVO | 0.2 | |
| 296 | A | 271805 | 195585 | brown clay | NVO | 0.1 | |
| 297 | A | 271815 | 195585 | brown silty sand | NVO | 0.6 | |
| 298 | A | 271825 | 195585 | brown clay and gravel | NVO | 0.1 | |
| 299 | A | 271835 | 195585 | red gravel or roadbase - next to road | NVO | 3.2 | |
| 300 | G | 271535 | 195575 | gravelly clay | NVO | 0.0 | |
| 301 | G | 271545 | 195575 | gravelly clay | NVO | 0.0 | |
| 302 | G | 271555 | 195575 | gravelly clay | NVO | 0.0 | |
| 303 | G | 271565 | 195575 | sandy clay | NVO | 0.0 | |
| 304 | G | 271575 | 195575 | gravelly clay and broken rock | NVO | 0.0 | |
| 305 | G | 271585 | 195575 | clay | NVO | 0.9 | |
| 306 | G | 271595 | 195575 | gravelly clay | NVO | 2.1 | |
| 307 | G | 271605 | 195575 | clay - black staining and sheen | NVO | 16.4 | |
| 308 | G | 271615 | 195575 | gravelly clay | NVO | 0.3 | |
| 309 | C | 271625 | 195575 | gravelly clay | NVO | 2.3 | |
| 310 | P2 | 271635 | 195575 | soft clay | NVO | 15.3 | |
| 311 | C | 271645 | 195575 | Tarmac next to gas governor | NVO | 0.0 | |
| 312 | C | 271655 | 195575 | brown clay | NVO | 0.7 | |
| 313 | C | 271665 | 195575 | brown silty clay with stones | NVO | 0.7 | |
| 314 | C | 271675 | 195575 | brown clay | NVO | 1.1 | |
| 315 | D | 271685 | 195575 | brown clay | NVO | 0.2 | |
| 316 | D | 271695 | 195575 | clay | NVO | 0.5 | |
| 317 | D | 271705 | 195575 | gravelly clay on rock | NVO | 0.8 | |
| 318 | D | 271715 | 195575 | gravel with clay | NVO | 0.3 | |
| 319 | D | 271725 | 195575 | gravelly clay on rock | NVO | 0.3 | |
| 320 | D | 271735 | 195575 | brown clay over rockhead | NVO | 0.8 | |
| 321 | D | 271745 | 195575 | dark brown clay | NVO | 0.5 | |
| 322 | A | 271755 | 195575 | brown gravelly clay | NVO | 0.0 | |
| 323 | A | 271765 | 195575 | loose gravelly clay | NVO | 0.1 | |
| 324 | A | 271775 | 195575 | brown gravelly clay | NVO | 0.0 | |
| 325 | A2 | 271785 | 195575 | brown gravelly clay | NVO | 0.0 | |
| 326 | A2 | 271795 | 195575 | brown clay | NVO | 0.2 | |
| 327 | A2 | 271805 | 195575 | brown sandy clay | NVO | 0.2 | |
| 328 | A | 271815 | 195575 | brown clay and gravel | NVO | 0.2 | |
| 329 | A | 271825 | 195575 | brown clay and gravel | NVO | 0.2 | |
| 330 | G | 271535 | 195565 | gravelly clay | NVO | 0.0 | |
| 331 | G | 271545 | 195565 | gravelly clay | NVO | 0.0 | |
| 332 | G | 271555 | 195565 | gravelly clay | NVO | 0.0 | |
| 333 | G | 271565 | 195565 | sandy clay | NVO | 0.0 | |
| 334 | G | 271575 | 195565 | gravelly clay | NVO | 0.0 | |
| 335 | G | 271585 | 195565 | clay | NVO | 3.1 | |
| 336 | G | 271595 | 195565 | gravelly clay | NVO | 1.4 | |
| 337 | G | 271605 | 195565 | sandy gravel | NVO | 1.0 | |
| 338 | C | 271615 | 195565 | gravelly clay | NVO | 0.1 | |
| 339 | P2 | 271625 | 195565 | soft clay | NVO | 4.5 | |
| 340 | P2 | 271635 | 195565 | clay | NVO | 1.7 | |
| 341 | C | 271645 | 195565 | Corner of gas governor, unremediated | NVO | 0.0 | |
| 342 | C | 271655 | 195565 | brown clay with rock | NVO | 0.6 | |
| 343 | C | 271665 | 195565 | brown silty clay with stones | NVO | 40.2 | Area removed |
| 344 | C | 271675 | 195565 | brown clay | NVO | 1.5 | |
| 345 | C | 271685 | 195565 | rockhead with some clay on top | NVO | 0.4 | |
| 346 | C | 271695 | 195565 | brown gravelly clay with rocks | NVO | 2.1 | |
| 347 | D | 271705 | 195565 | rockhead, no sample | NVO | - | |
| 348 | D | 271715 | 195565 | gravelly brown clay | NVO | 0.4 | |
| 349 | D | 271725 | 195565 | brown gravelly clay | NVO | 0.2 | |
| 350 | D | 271735 | 195565 | brown clay over rockhead | NVO | 0.5 | |
| 351 | D | 271745 | 195565 | dark brown clay | NVO | 0.4 | |
| 352 | D | 271755 | 195565 | brown gravelly clay | NVO | 0.0 | |
| 353 | A | 271765 | 195565 | brown clay | NVO | 0.2 | |
| 354 | A | 271775 | 195565 | dark brown clay | NVO | 0.0 | |
| 355 | A | 271785 | 195565 | brown gravelly clay | NVO | 0.5 | |
| 356 | A | 271795 | 195565 | brown gravelly clay | NVO | 0.2 | |
| 357 | A | 271805 | 195565 | brown clay | NVO | 0.4 | |
| 358 | A | 271815 | 195565 | clay and rock | NVO | 0.0 | |
| 359 | A | 271825 | 195565 | soil and rock | NVO | 0.0 | |
| 360 | G | 271505 | 195555 | gravelly clay | NVO | 0.0 | |
| 360 | G | 271505 | 195555 | gravelly clay | NVO | 0.0 | |
| 361 | G | 271515 | 195555 | gravelly clay | NVO | 0.0 | |
| 362 | G | 271525 | 195555 | brown rock and clay | NVO | 0.0 | |
| 363 | G | 271535 | 195555 | gravelly clay | NVO | 0.0 | |
| 364 | G | 271545 | 195555 | gravelly clay | NVO | 0.0 | |
| 365 | G | 271555 | 195555 | broken rock and clay | NVO | 0.0 | |
| 366 | G | 271565 | 195555 | clay and rock | NVO | 0.0 | |
| 367 | G | 271575 | 195555 | clay and rock | NVO | 0.0 | |
| 368 | C | 271585 | 195555 | gravelly clay | NVO | 0.1 | |
| 369 | C | 271595 | 195555 | gravelly clay | NVO | 0.8 | |
| 370 | C | 271605 | 195555 | gravelly clay | NVO | 1.8 | |
| 371 | P2 | 271615 | 195555 | gravelly clay | NVO | 0.7 | |
| 372 | P2 | 271625 | 195555 | clay and gravel | NVO | 1.3 | |
| 373 | P2 | 271635 | 195555 | clay | NVO | 1.3 | |
| 374 | C | 271645 | 195555 | rockhead | NVO | 1.0 | |
| 375 | C | 271655 | 195555 | brown clay with gravel | NVO | 0.3 | |
| 376 | C | 271665 | 195555 | brown silty clay with stones | NVO | 2.1 | |
| 377 | C | 271675 | 195555 | brown clay | NVO | 1.0 | |
| 378 | C | 271685 | 195555 | brown gravelly clay | NVO | 0.7 | |
| 379 | C | 271695 | 195555 | brown clay | NVO | 0.0 | |
| 380 | C | 271705 | 195555 | clay over rockhead | NVO | 0.1 | |
| 381 | C | 271715 | 195555 | brown gravelly clay | NVO | 0.3 | |
| 382 | C | 271725 | 195555 | brown clay | NVO | 0.2 | |
| 383 | D | 271735 | 195555 | soft dark brown silty clay | NVO | 0.5 | |

**TABLE 2**
**Photo Ionisation Detector (PID) Validation**

| PID Location Reference | Area | Easting | Northing | Description | Observations | PID (ppm) | Comments |
|---|---|---|---|---|---|---|---|
| 384 | D | 271745 | 195555 | dark brown clay | NVO | 0.4 | |
| 385 | D | 271755 | 195555 | Out of boundary | NVO | 0.0 | |
| 386 | P2 | 271765 | 195555 | gravelly clay | NVO | 0.0 | |
| 387 | A | 271775 | 195555 | gravelly clay | NVO | 0.0 | |
| 388 | A | 271785 | 195555 | gravelly clay | NVO | 0.0 | |
| 389 | A | 271795 | 195555 | gravelly clay | NVO | 0.0 | |
| 390 | A | 271805 | 195555 | gravelly clay | NVO | 0.0 | |
| 391 | A | 271815 | 195555 | clay over rock | NVO | 0.0 | |
| 392 | G | 271505 | 195545 | gravelly clay | NVO | 0.0 | |
| 393 | G | 271515 | 195545 | gravelly clay | NVO | 0.0 | |
| 394 | G | 271525 | 195545 | gravelly clay | NVO | 0.0 | |
| 395 | G | 271535 | 195545 | gravelly clay | NVO | 0.0 | |
| 396 | G | 271545 | 195550 | grassy verge | NVO | 0.0 | Edge of site boundary |
| 397 | P2 | 271555 | 195550 | grassy verge | NVO | 0.0 | Edge of site boundary |
| 398 | P2 | 271565 | 195548 | grassy verge by road | NVO | 0.1 | Edge of site boundary |
| 399 | P2 | 271575 | 195545 | grassy verge by road | NVO | 0.0 | |
| 400 | P2 | 271585 | 195545 | gravelly clay | NVO | 3.0 | |
| 401 | P2 | 271595 | 195545 | bank at edge of road | NVO | 0.1 | |
| 402 | P2 | 271605 | 195545 | gravelly clay | NVO | 1.5 | |
| 403 | P2 | 271615 | 195545 | clay | NVO | 0.4 | |
| 404 | CA | 271625 | 195545 | brown sandy clay with gravels | NVO | 1.4 | |
| 405 | CA | 271635 | 195545 | brown gravelly clay | NVO | 0.0 | |
| 406 | CA | 271645 | 195545 | brown gravelly clay | NVO | 0.0 | |
| 407 | CA | 271655 | 195545 | brown clay with gravel | NVO | 0.0 | |
| 408 | C | 271665 | 195545 | brown clay with gravel | NVO | 0.0 | |
| 409 | C | 271675 | 195545 | brown clay | NVO | 0.9 | |
| 410 | C | 271685 | 195545 | brown gravelly clay | NVO | 0.8 | |
| 411 | C | 271695 | 195545 | brown gravelly clay | NVO | 0.4 | |
| 412 | C | 271705 | 195545 | brown clay with gravel | NVO | 0.2 | |
| 413 | C | 271715 | 195545 | brown gravelly clay | NVO | 0.2 | |
| 414 | CA | 271725 | 195545 | brown gravelly clay | NVO | 0.2 | |
| 415 | CA | 271735 | 195545 | clay | NVO | 0.0 | |
| 416 | CA | 271745 | 195545 | brown soil with rootlets and gravel | NVO | 0.0 | |
| 417 | CA | 271755 | 195545 | brown soil with rootlets and gravel | NVO | 0.0 | |
| 418 | CA | 271765 | 195545 | brown sandy gravel | NVO | 0.0 | |
| 419 | CA | 271775 | 195545 | clay and rock | NVO | 0.0 | |
| 420 | CA | 271785 | 195545 | clay and rock | NVO | 0.0 | |
| 421 | CA | 271795 | 195545 | clay and rock | NVO | 0.0 | |
| 422 | CA | 271805 | 195545 | clay and rock | NVO | 0.0 | |
| 423 | CS | 271635 | 195715 | on concrete footpath | - | - | |
| 424 | CS | 271645 | 195715 | on concrete footpath | - | - | |
| 425 | CS | 271655 | 195715 | grass over dark brown gravelly clay | NVO | 0.4 | |
| 426 | CS | 271665 | 195715 | grass over dark brown gravelly clay | NVO | 1.1 | |
| 427 | CS | 271675 | 195715 | grass over dark brown gravelly clay | NVO | 0.7 | |
| 428 | CS | 271685 | 195715 | grass over dark brown gravelly clay | NVO | 0.1 | |
| 429 | CS | 271695 | 195715 | grass over dark brown gravelly clay | NVO | 0.2 | |
| 430 | CS | 271705 | 195715 | brown gravelly clay with rocks | NVO | 3.1 | |
| 431 | CS | 271715 | 195715 | brown gravelly clay | NVO | 2.0 | |
| 432 | CS | 271725 | 195715 | brown gravelly clay | NVO | 1.3 | |
| 433 | CS | 271735 | 195715 | brown gravelly clay | NVO | 1.0 | |
| 434 | CS | 271745 | 195715 | brown gravelly clay | NVO | 3.8 | |
| 435 | CS | 271755 | 195715 | brown gravelly clay with rocks | NVO | 2.8 | |
| 436 | CS | 271765 | 195715 | brown gravelly clay with rocks | NVO | 1.3 | |
| 437 | CS | 271645 | 195705 | grass over dark brown gravelly clay | NVO | 0.2 | |
| 438 | CS | 271655 | 195705 | grass over dark brown gravelly clay | NVO | 0.4 | |
| 439 | CS | 271665 | 195705 | grass over dark brown gravelly clay | NVO | 0.1 | |
| 440 | CS | 271675 | 195705 | grass over dark brown gravelly clay | NVO | 0.9 | |
| 441 | CS | 271685 | 195705 | grass over dark brown gravelly clay | NVO | 0.6 | |
| 442 | CS | 271695 | 195705 | grass over dark brown gravelly clay | NVO | 0.2 | |
| 443 | CS | 271705 | 195705 | brown gravelly clay | NVO | 4.9 | |
| 444 | CS | 271715 | 195705 | brown gravelly clay with rock pieces | NVO | 3.0 | |
| 445 | CS | 271745 | 195705 | brown gravelly clay | NVO | 4.1 | |
| 446 | CS | 271755 | 195705 | brown gravelly clay with rocks | NVO | 2.9 | |
| 447 | CS | 271765 | 195705 | brown gravelly clay with rocks | NVO | 1.1 | |
| 448 | CS | 271655 | 195695 | brown gravelly clay | NVO | 4.0 | |
| 449 | CS | 271665 | 195695 | grass over dark brown gravelly clay | NVO | 0.5 | |
| 450 | CS | 271675 | 195695 | grass over dark brown gravelly clay | NVO | 0.0 | |
| 451 | CS | 271745 | 195695 | brown clay with occ rocks | NVO | 2.1 | |
| 452 | CS | 271755 | 195695 | brown clay with occ rocks | NVO | 1.8 | |
| 453 | CS | 271665 | 195685 | grey/brown gravel with rock pieces | NVO | 0.8 | |
| 454 | CS | 271765 | 195725 | brown gravelly clay | NVO | 0.8 | |
| 455 | CS | 271755 | 195725 | on concrete footpath | NVO | - | |
| 456 | P2 | 271815 | 195545 | Out of boundary | NVO | - | |
| 457 | P2 | 271605 | 195535 | Out of boundary | NVO | - | |
| 458 | P2 | 271615 | 195536 | Out of boundary | NVO | - | |
| 459 | P2 | 271625 | 195535 | brown soil with gravels | NVO | 0.0 | |
| 460 | P2 | 271635 | 195535 | brown soil with gravels | NVO | 0.0 | |
| 461 | P2 | 271645 | 195535 | brown soil with gravels | NVO | 0.0 | |
| 462 | P2 | 271655 | 195535 | brown clayey soil | NVO | 0.0 | |
| 463 | P2 | 271665 | 195535 | brown clayey soil | NVO | 0.0 | |
| 464 | P2 | 271675 | 195535 | brown clayey soil | NVO | 0.0 | |
| 465 | P2 | 271685 | 195535 | brown soil with rootlets and gravel | NVO | 0.0 | |
| 466 | P2 | 271695 | 195535 | brown soil with rootlets and gravel | NVO | 0.0 | |
| 467 | P2 | 271705 | 195535 | brown soil with rootlets and gravel | NVO | 0.0 | |
| 468 | P2 | 271715 | 195535 | brown soil with rootlets and gravel | NVO | 0.0 | |
| 469 | P2 | 271725 | 195535 | brown soil with rootlets and gravel | NVO | 0.0 | |
| 470 | P2 | 271235 | 195535 | brown soil with rootlets and gravel | NVO | 0.0 | |
| 471 | P2 | 271735 | 195535 | brown soil with rootlets and gravel | NVO | 0.0 | |
| 472 | P2 | 271755 | 195535 | clay and rock | NVO | 0.0 | |
| 473 | P2 | 271765 | 195535 | soil and rock | NVO | 0.0 | |
| 474 | P2 | 271775 | 195535 | soil and rock | NVO | 0.0 | |
| 475 | P2 | 271785 | 195535 | soil and rock | NVO | 0.0 | |
| 476 | P2 | 271795 | 195535 | clay and rock | NVO | 0.0 | |
| 477 | P2 | 271805 | 195535 | soil and vegetation | NVO | 6.1 | |
| 478 | P2 | 271635 | 195525 | Out of boundary | NVO | - | |
| 479 | P2 | 271645 | 195525 | Out of boundary | NVO | - | |

**TABLE 2**
**Photo Ionisation Detector (PID) Validation**

| PID Location Reference | Area | Easting | Northing | Description | Observations | PID (ppm) | Comments |
|---|---|---|---|---|---|---|---|
| 480 | P2 | 271655 | 195525 | clay and rock | NVO | 0.0 | |
| 481 | P2 | 271665 | 195525 | clay and rock | NVO | 0.0 | |
| 482 | P2 | 271675 | 195525 | yellow brown sand with gravel | NVO | 0.0 | |
| 483 | P2 | 271685 | 195525 | brown silty sandy with gravel | NVO | 0.0 | |
| 484 | P2 | 271695 | 195525 | brown silty sandy with gravel | NVO | 0.0 | |
| 485 | P2 | 271705 | 195525 | brown silty sandy with gravel | NVO | 0.0 | |
| 486 | P2 | 271715 | 195525 | brown silty sandy with gravel | NVO | 0.0 | |
| 487 | P2 | 271725 | 195525 | brown silty sandy with gravel | NVO | 0.0 | |
| 488 | P2 | 271735 | 195525 | soil with rock | NVO | 0.2 | |
| 489 | P2 | 271745 | 195525 | soil and rock with rootlets | NVO | 0.6 | |
| 490 | P2 | 271755 | 195525 | clay and rock | NVO | 0.4 | |
| 491 | P2 | 271765 | 195525 | soil and clay | NVO | 0.0 | |
| 492 | P2 | 271775 | 195525 | clayey soil | NVO | 0.4 | |
| 493 | P2 | 271785 | 195525 | gravelly clayey soil | NVO | 0.5 | |
| 494 | P2 | 271795 | 195525 | on pavement | NVO | - | |
| 495 | P2 | 271675 | 195515 | on pavement | NVO | - | |
| 496 | P2 | 271685 | 195515 | on pavement | NVO | - | |
| 497 | P2 | 271695 | 195515 | soil and rock with rootlets | NVO | 0.0 | |
| 498 | P2 | 271705 | 195515 | soil and rock with rootlets | NVO | 0.0 | |
| 499 | P2 | 271715 | 195515 | reworked clay and rock | NVO | 0.0 | |
| 500 | P2 | 271725 | 195515 | reworked clay and rock | NVO | 0.6 | |
| 501 | P2 | 271735 | 195515 | reworked clay and rock | NVO | 0.6 | |
| 502 | P2 | 271745 | 195515 | soil and rock | NVO | 0.4 | |
| 503 | P2 | 271755 | 195515 | vegetation and clay/soil | NVO | 0.6 | |
| 504 | P2 | 271765 | 195515 | off site | NVO | - | |
| 505 | P2 | 271775 | 195515 | off site | NVO | - | |
| 506 | P2 | 271785 | 195515 | off site | NVO | - | |
| 507 | P2 | 271705 | 195505 | off site | NVO | - | |
| 508 | P2 | 271715 | 195505 | off site | NVO | - | |
| 509 | P2 | 271725 | 195505 | off site | NVO | - | |
| 510 | P2 | 271735 | 195505 | grass over soil | NVO | 0.6 | |
| 511 | P2 | 271745 | 195505 | off site | NVO | - | |
| 512 | P2 | 271755 | 195505 | off site | NVO | - | |
| 112a | A | 271845 | 195645 | brown gravelly sand | NVO | 3.8 | |
| 170a | A | 271855 | 195625 | brown gravelly clay | NVO | 3.4 | |
| 25a | F | 271675 | 195685 | concrete, gravel, brick | NVO | 0.0 | |
| 2a | B | 271795 | 195735 | brown gravelly clay | NVO | 0.1 | |
| 3a | B | 271805 | 195725 | brown clay | NVO | 0.1 | |
| 69a | B | 271815 | 195665 | rock, no sample | NVO | - | |

**Table 3a - Volatile Organic Compound (VOC) Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | VOC |
|---|---|

| RBSL (mg/kg) | | | 154 | 0.04 | 0.12 | 4 | 5 | 37 | 32 | 32 | 11 | 36 | 4 | 1 | 0.01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | A_1_1_1_TRICHLOROETHANE | A_1_2_DICHLOROETHANE | BENZENE | CIS_1_2_DICHLOROETHENE | DICHLOROMETHANE | ETHYLBENZENE | M_P_XYLENE | O_XYLENE | TETRACHLOROETHENE | TOLUENE | TRANS_1_2_DICHLOROETHENE | TRICHLOROETHENE | VINYL_CHLORIDE |
| CE01N | 0.5 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| CE01S | 0.5 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| CE02N | 1.5 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| CE02S | 1.5 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.006 | ND |
| CE03 | 1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0095 | ND |
| CE04 | 1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.071 | ND |
| CE05 | 1 | 09/12/2008 | ND | ND | ND | ND | 0.0069 | ND | ND | ND | ND | ND | ND | 0.052 | ND |
| CE06B | 1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.011 | ND |
| CE06N | 1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.024 | ND |
| CE06S | 1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0061 | ND |
| CE07 | 3 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.028 | ND |
| CE08 | 3 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.019 | ND |
| CE09 | 3 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.013 | ND |
| CE10 | 3 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.011 | ND |
| TP001 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP002 | 0.1 | 20/05/2009 | ND | ND | ND | ND | 0.0074 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP003 | 0.1 | 20/05/2009 | ND | ND | ND | ND | 0.0071 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 20/05/2009 | ND | ND | ND | ND | 0.0066 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP004 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.95 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP006 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.6 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP007 | 0.15 | 04/03/2008 | ND | ND | ND | ND | 0.0074 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1 | 04/03/2008 | ND | ND | ND | ND | 0.0058 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP008 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.5 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP009 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.45 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP010 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP011 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.6 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP012 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.5 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP013 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP014 | 0 | 02/04/2008 | ND | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | ND |
| TP015 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.5 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP017 | 0.1 | 20/05/2009 | ND | ND | ND | ND | 0.0074 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP018 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP019 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.4 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP020 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.75 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP021 | 0 | 02/04/2008 | ND | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | ND |
| TP022 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.5 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP023 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.75 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP024 | 0.1 | 20/05/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP025 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP026 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.5 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP027 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.8 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP028 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.9 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP029 | 0.1 | 20/05/2009 | ND | ND | ND | ND | 0.0059 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP030 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP031 | 0.2 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.9 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP032 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP033 | 0.14 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP034 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP035 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.9 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP036 | 0.1 | 10/12/2008 | ND | ND | ND | ND | 0.012 | ND | ND | ND | ND | ND | ND | 0.065 | ND |
| TP037 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP038 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.9 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP039 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.85 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND | 0.021 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP040 | 0.05 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP041 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.55 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP042 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP043 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.95 | 04/03/2008 | ND | ND | ND | ND | 0.009 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP044 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.8 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP045 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.6 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP046 | 0 | 02/04/2008 | ND | ND | ND | ND | 0.0056 | 0.0087 | ND | ND | ND | ND | ND | ND | ND |
| TP047 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.013 | ND |
| TP048 | 0.1 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP049 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.3 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.7 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP050 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.9 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP051 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP052 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP053 | 0.1 | 03/12/2008 | ND | ND | ND | ND | 0.021 | ND | ND | ND | ND | ND | ND | 0.0065 | ND |
| TP054 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP055 | 0.15 | 04/03/2008 | ND | ND | ND | ND | 0.012 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2 | 04/03/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP056 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP057 | 0 | 03/03/2008 | ND | ND | ND | ND | ND | 0.0053 | 0.026 | 0.014 | ND | ND | ND | ND | ND |
| TP058 | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP059 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP060 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP061 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP062 | 0.1 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

ND - not detected above the method detection limit

| Chem Class | VOC |
|---|---|

| RBSL (mg/kg) | | | 154 | 0.04 | 0.12 | 4 | 5 | 37 | 32 | 32 | 11 | 36 | 4 | 1 | 0.01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | A_1_1_1_TRICHLOROETHANE | A_1_2_DICHLOROETHANE | BENZENE | CIS_1_2_DICHLOROETHENE | DICHLOROMETHANE | ETHYLBENZENE | M_P_XYLENE | O_XYLENE | TETRACHLOROETHENE | TOLUENE | TRANS_1_2_DICHLOROETHENE | TRICHLOROETHENE | VINYL_CHLORIDE |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.2 | 01/12/2008 | ND | ND | ND | ND | 0.015 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP063 | 0.2 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.85 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP064 | 0 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP065 | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.65 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP068 | 0.1 | 01/12/2008 | ND | ND | ND | ND | 0.017 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.5 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP069 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP070 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP071 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.2 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP072 | 0.15 | 05/03/2008 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.55 | 05/03/2008 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND |
| TP073 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP074 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.95 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP077 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP078 | 0.1 | 01/12/2008 | ND | ND | ND | ND | 0.016 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND | 0.016 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP079 | 0.1 | 01/12/2008 | ND | ND | ND | ND | 0.014 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP080 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.2 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP081 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.1 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP082 | 0 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP083 | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.5 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP084 | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP087 | 0.1 | 01/12/2008 | ND | ND | ND | ND | 0.0088 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP088 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP089 | 0.1 | 02/12/2008 | ND | ND | ND | ND | 0.016 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP090 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.2 | 01/12/2008 | ND | ND | ND | ND | 0.014 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP091 | 0.2 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP092 | 0 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP093 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP094 | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.6 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP098 | 0.1 | 02/12/2008 | ND | ND | ND | ND | 0.0078 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP099 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.013 | ND |
| TP100 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND | 0.017 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP101 | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.04 | ND |
| TP102 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP103 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP104 | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP107 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP108 | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP109 | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP110 | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 02/12/2008 | ND | ND | ND | ND | 0.014 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 02/12/2008 | ND | ND | ND | ND | 0.0094 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP111 | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.034 | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.037 | ND |
| | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.032 | ND |
| TP112 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.65 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP113 | 0 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP114 | 0 | 06/03/2008 | ND | ND | ND | ND | 0.0059 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP119 | 0.1 | 01/12/2008 | ND | ND | ND | ND | 0.02 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP120 | 0.1 | 02/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP121 | 0.1 | 02/12/2008 | ND | ND | ND | ND | 0.013 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP122 | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.034 | ND |
| TP123 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.95 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP124 | 0 | 05/03/2008 | ND | ND | ND | 0.044 | ND | ND | ND | ND | ND | ND | ND | ND | 0.0069 |
| TP125 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP126 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.85 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP130 | 0.1 | 01/12/2008 | ND | ND | ND | ND | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP131 | 0.1 | 02/12/2008 | ND | ND | ND | ND | 0.016 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP132 | 0.1 | 02/12/2008 | ND | ND | ND | ND | 0.0077 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND | 0.014 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP133 | 0.1 | 02/12/2008 | ND | ND | ND | ND | 0.0083 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.5 | 02/12/2008 | ND | ND | ND | ND | 0.0075 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP134 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.035 | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.029 | ND |
| | 1.4 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.041 | ND |
| TP135 | 0 | 05/03/2008 | ND | ND | ND | 0.006 | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP136 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP137 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.85 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP141 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP142 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP143 | 0.1 | 10/12/2008 | ND | ND | ND | ND | 0.0098 | ND | ND | ND | ND | ND | ND | 0.014 | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.025 | ND |
| | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.013 | ND |
| TP144 | 0.1 | 09/12/2008 | ND | ND | ND | ND | 0.013 | ND | ND | ND | ND | ND | ND | 0.031 | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | 0.0063 | ND | ND | ND | ND | ND | ND | 0.034 | ND |
| | 1.4 | 09/12/2008 | ND | ND | ND | ND | 0.0085 | ND | ND | ND | ND | ND | ND | 0.034 | ND |
| | 2.1 | 09/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | 0.031 | ND |
| TP145 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.85 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP146 | 0 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP147 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP151 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP152 | 0.1 | 03/12/2008 | ND | ND | ND | ND | 0.017 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | 0.019 | ND | ND | ND | ND | ND | ND | 0.0084 | ND |
| TP153 | 0.1 | 10/12/2008 | ND | ND | ND | ND | 0.0057 | ND | ND | ND | ND | ND | ND | 0.019 | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.014 | ND |
| | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP154 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.015 | ND |
| TP155 | 0.1 | 09/12/2008 | ND | ND | ND | ND | 0.0073 | ND | ND | ND | ND | ND | ND | 0.038 | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | 0.012 | ND | ND | ND | ND | ND | ND | 0.041 | ND |
| TP156 | 0 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP157 | 0.2 | 06/03/2008 | ND | ND | ND | ND | 0.0067 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP158 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

ND - not detected above the method detection limit

| Chem Class | VOC |
|---|---|

| RBSL (mg/kg) | | | 154 | 0.04 | 0.12 | 4 | 5 | 37 | 32 | 32 | 11 | 36 | 4 | 1 | 0.01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | A_1_1_1_TRICHLOROETHANE | A_1_2_DICHLOROETHANE | BENZENE | CIS_1_2_DICHLOROETHENE | DICHLOROMETHANE | ETHYLBENZENE | M_P_XYLENE | O_XYLENE | TETRACHLOROETHENE | TOLUENE | TRANS_1_2_DICHLOROETHENE | TRICHLOROETHENE | VINYL_CHLORIDE |
| TP162 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP163 | 0.1 | 05/12/2008 | ND | ND | ND | ND | 0.008 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | 0.0069 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 05/12/2008 | ND | ND | ND | ND | 0.007 | ND | ND | ND | ND | ND | ND | 0.0062 | ND |
| TP164 | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.044 | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.042 | ND |
| | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.05 | ND |
| TP165 | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.015 | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.036 | ND |
| TP166 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP167 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP168 | 0.7 | 06/03/2008 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.2 | 10/04/2008 | ND | ND | ND | ND | 0.012 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP171 | 0.1 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP172 | | 04/12/2008 | ND | ND | ND | ND | 0.017 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP173 | 0.1 | 03/12/2008 | ND | ND | ND | ND | 0.0071 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | 0.0076 | ND | ND | ND | ND | ND | ND | 0.009 | ND |
| TP174 | 0.1 | 02/12/2008 | ND | ND | ND | ND | 0.013 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP175 | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.02 | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.043 | ND |
| TP176 | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.038 | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.067 | ND |
| TP177 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP178 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP179 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.9 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP180 | 0.2 | 09/04/2008 | ND | ND | ND | ND | 0.0074 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1 | 09/04/2008 | ND | ND | ND | ND | 0.0056 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.15 | 09/04/2008 | ND | ND | ND | ND | 0.0071 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.8 | 09/04/2008 | ND | ND | ND | ND | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.1 | 09/04/2008 | ND | ND | ND | ND | 0.009 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.014 | ND |
| TP182 | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.02 | ND |
| TP183 | 0.1 | 04/12/2008 | ND | ND | ND | ND | 0.021 | ND | ND | ND | ND | ND | ND | 0.018 | ND |
| | 0.7 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | | 04/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | 0.023 | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | 0.026 | ND |
| TP184 | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.013 | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | 0.008 | ND | ND | ND | ND | ND | ND | 0.025 | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | 0.012 | ND | ND | ND | ND | ND | ND | 0.01 | ND |
| | 2.1 | 04/12/2008 | ND | ND | ND | ND | 0.0083 | ND | ND | ND | ND | ND | ND | 0.0099 | ND |
| TP185 | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.01 | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 04/12/2008 | ND | ND | ND | ND | 0.0067 | ND | ND | ND | ND | ND | ND | 0.0065 | ND |
| TP186 | 0.1 | 03/12/2008 | ND | ND | ND | ND | 0.0087 | ND | ND | ND | ND | ND | ND | 0.0087 | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP187 | 0.1 | 04/12/2008 | ND | ND | ND | ND | 0.013 | ND | ND | ND | ND | ND | ND | 0.0074 | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | 0.0091 | ND | ND | ND | ND | ND | ND | 0.0066 | ND |
| TP188 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0072 | ND |
| TP189 | 0.1 | 09/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | 0.026 | ND |
| TP190 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP191 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP192 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP193 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP196 | 0.1 | 03/12/2008 | ND | ND | ND | ND | 0.0063 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | 0.014 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | 0.0055 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 03/12/2008 | ND | ND | ND | ND | 0.019 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP197 | 0.1 | 03/12/2008 | ND | ND | ND | ND | 0.0075 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP198 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0071 | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0059 | ND |
| TP199 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP200 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.037 | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | 0.0076 | ND | ND | ND | ND | ND | ND | 0.037 | ND |
| | 1.4 | 09/12/2008 | ND | ND | ND | ND | 0.008 | ND | ND | ND | ND | ND | ND | 0.02 | ND |
| TP201 | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.044 | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | 0.0081 | ND | ND | ND | ND | ND | ND | 0.06 | ND |
| TP202 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.3 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP203 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP204 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.85 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP205 | 0.3 | 09/04/2008 | ND | ND | ND | ND | 0.006 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.1 | 09/04/2008 | ND | ND | ND | ND | 0.0058 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | 0.0065 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.1 | 09/04/2008 | ND | ND | ND | ND | 0.0067 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 09/04/2008 | ND | ND | ND | ND | 0.0056 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.025 | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.021 | ND |
| TP206 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.018 | ND |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | 0.0092 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.028 | ND |
| TP207 | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.022 | ND |
| TP208 | 0.1 | 03/12/2008 | ND | ND | ND | ND | 0.0065 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | 0.016 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 03/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP209 | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | 0.0095 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 03/12/2008 | ND | ND | ND | ND | 0.0079 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.8 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP210 | 0.1 | 03/12/2008 | ND | ND | ND | ND | 0.0081 | ND | ND | ND | ND | ND | ND | 0.0085 | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | 0.0068 | ND |
| TP211 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0091 | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0076 | ND |
| | 2.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.7 | 20/05/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.8 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP212 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.013 | ND |
| | 0.8 | 20/05/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

ND - not detected above the method detection limit

**Table 3a - Volatile Organic Compound (VOC) Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | VOC |
|---|---|

| RBSL (mg/kg) | | | 154 | 0.04 | 0.12 | 4 | 5 | 37 | 32 | 32 | 11 | 36 | 4 | 1 | 0.01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | A_1_1_1_TRICHLOROETHANE | A_1_2_DICHLOROETHANE | BENZENE | CIS_1_2_DICHLOROETHENE | DICHLOROMETHANE | ETHYLBENZENE | M_P_XYLENE | O_XYLENE | TETRACHLOROETHENE | TOLUENE | TRANS_1_2_DICHLOROETHENE | TRICHLOROETHENE | VINYL_CHLORIDE |
| TP213 | 0.1 | 10/12/2008 | ND | ND | ND | ND | 0.013 | ND | ND | ND | ND | ND | ND | 0.058 | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.014 | ND |
| | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.036 | ND |
| | 2.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.016 | ND |
| TP214 | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0066 | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | 0.02 | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | 0.0081 | ND | ND | ND | ND | ND | ND | 0.017 | ND |
| TP215 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.019 | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.014 | ND |
| TP216 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP217 | 0.3 | 09/04/2008 | ND | ND | ND | ND | 0.0069 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.8 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1 | 09/04/2008 | ND | ND | ND | ND | 0.0059 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.6 | 09/04/2008 | ND | ND | ND | ND | 0.0058 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0098 | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.015 | ND |
| TP218 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.015 | ND |
| | 0.15 | 09/04/2008 | ND | ND | ND | ND | 0.0082 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.1 | 09/04/2008 | ND | ND | ND | ND | 0.0063 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.019 | ND |
| TP219 | 0.7 | 08/12/2008 | ND | ND | ND | ND | 0.0056 | ND | ND | ND | ND | ND | ND | 0.027 | ND |
| TP220 | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | 0.007 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | 0.014 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 03/12/2008 | ND | ND | ND | ND | 0.016 | ND | ND | ND | ND | ND | ND | 0.0062 | ND |
| TP221 | 0.1 | 03/12/2008 | ND | ND | ND | ND | 0.013 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | 0.017 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP222 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0088 | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP225 | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP226 | 0.1 | 04/12/2008 | ND | ND | ND | ND | 0.0093 | ND | ND | ND | ND | ND | ND | 0.0066 | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | 0.014 | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.01 | ND |
| | 2.1 | 04/12/2008 | ND | ND | ND | ND | 0.0091 | ND | ND | ND | ND | ND | ND | 0.0079 | ND |
| TP227 | 0.1 | 04/12/2008 | ND | ND | ND | ND | 0.006 | ND | ND | ND | ND | ND | ND | 0.008 | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.007 | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0097 | ND |
| | 2.1 | 04/12/2008 | ND | ND | ND | ND | 0.0066 | ND | ND | ND | ND | ND | ND | 0.0093 | ND |
| TP228 | 0.1 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP229 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.02 | ND |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.031 | ND |
| | 2.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.018 | ND |
| | 2.8 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.03 | ND |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP230 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP231 | 0.1 | 04/12/2008 | ND | ND | ND | ND | 0.0063 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP232 | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | 0.015 | ND | ND | ND | ND | ND | ND | 0.0074 | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | 0.0098 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP233 | 0.1 | 04/12/2008 | ND | ND | ND | ND | 0.0085 | ND | ND | ND | ND | ND | ND | 0.0094 | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | 0.0061 | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | 0.0092 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 04/12/2008 | ND | ND | ND | ND | 0.0088 | ND | ND | ND | ND | ND | ND | 0.0097 | ND |
| TP234 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0056 | ND |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP235 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0063 | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0065 | ND |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.0093 | ND |
| TP236 | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.9 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP236E | 0 | 02/07/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP236 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.022 | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP237 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.01 | ND |
| TP238 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.016 | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.014 | ND |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.019 | ND |
| TP239 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP240 | 0.1 | 04/12/2008 | ND | ND | ND | ND | 0.0062 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | 0.0071 | ND | ND | ND | ND | ND | ND | 0.0091 | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.019 | ND |
| TP241 | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | 0.012 | ND | ND | ND | ND | ND | ND | 0.014 | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | 0.0072 | ND | ND | ND | ND | ND | ND | 0.0092 | ND |
| | 0.2 | 10/04/2008 | ND | ND | ND | ND | 0.0069 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1 | 10/04/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.7 | 10/04/2008 | ND | ND | ND | ND | 0.013 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 10/04/2008 | ND | ND | ND | ND | 0.0094 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP242 | 1.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | 0.0078 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.2 | 09/04/2008 | ND | ND | ND | ND | 0.0064 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.7 | 09/04/2008 | ND | ND | ND | ND | 0.0091 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.4 | 09/04/2008 | ND | ND | ND | ND | 0.0081 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP243 | 0.1 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP244 | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.8 | 09/04/2008 | ND | ND | ND | ND | 0.0068 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP244 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.022 | ND |
| TP245 | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | 0.0072 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 04/12/2008 | ND | ND | ND | ND | 0.02 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP246 | 0.1 | 09/12/2008 | ND | ND | ND | ND | 0.006 | ND | ND | ND | ND | ND | ND | 0.017 | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.014 | ND |
| | 1.4 | 09/12/2008 | ND | ND | ND | ND | 0.0085 | ND | ND | ND | ND | ND | ND | 0.028 | ND |
| | 2.1 | 09/12/2008 | ND | ND | ND | ND | 0.012 | ND | ND | ND | ND | ND | ND | 0.04 | ND |
| | 0.2 | 10/04/2008 | ND | ND | ND | ND | 0.01 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP247 | 0.9 | 10/04/2008 | ND | ND | ND | ND | 0.0075 | ND | ND | ND | ND | ND | ND | ND | ND |

ND - not detected above the method detection limit

**Table 3a - Volatile Organic Compound (VOC) Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | VOC |
|---|---|

| RBSL (mg/kg) | | | 154 | 0.04 | 0.12 | 4 | 5 | 37 | 32 | 32 | 11 | 36 | 4 | 1 | 0.01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | A_1_1_1_TRICHLOROETHANE | A_1_2_DICHLOROETHANE | BENZENE | CIS_1_2_DICHLOROETHENE | DICHLOROMETHANE | ETHYLBENZENE | M_P_XYLENE | O_XYLENE | TETRACHLOROETHENE | TOLUENE | TRANS_1_2_DICHLOROETHENE | TRICHLOROETHENE | VINYL_CHLORIDE |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | 0.0084 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP248 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.018 | ND |
| | 0.3 | 10/04/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1 | 10/04/2008 | ND | ND | ND | ND | 0.011 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP249 | 1.7 | 10/04/2008 | ND | ND | ND | ND | 0.0081 | ND | ND | ND | ND | ND | ND | ND | ND |
| TP250 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.019 | ND |
| TP251 | 0.1 | 09/12/2008 | ND | ND | ND | ND | 0.0083 | ND | ND | ND | ND | ND | ND | 0.023 | ND |
| TP252 | 0.2 | 10/04/2008 | ND | ND | ND | ND | 0.0099 | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.5 | 10/04/2008 | ND | ND | ND | ND | 0.0065 | ND | ND | ND | ND | ND | ND | ND | ND |

ND - not detected above the method detection limit

| Chem Class | TPH |
|---|---|

| Location | Depth | Sample_Date | TOTAL_RISK_TPH | RISK_TPH_C10_C12_ALI | RISK_TPH_C10_C12_AROM | RISK_TPH_C12_C16_ALI | RISK_TPH_C12_C16_AROM | RISK_TPH_C16_C21_ALI | RISK_TPH_C16_C21_AROM | RISK_TPH_C16_C35_ALI | RISK_TPH_C21_C35_AROM | RISK_TPH_C21_C40_ALI | RISK_TPH_C21_C40_AROM | RISK_TPH_C35_C44_ALI | RISK_TPH_C35_C44_AROM | RISK_TPH_C5_C44_ALI | RISK_TPH_C5_C44_ARO | RISK_TPH_C5_C6_ALI | RISK_TPH_C5_C7_ARO | RISK_TPH_C6_C40_ALI | RISK_TPH_C6_C40_AROM | RISK_TPH_C6_C8_ALI | RISK_TPH_C7_C8_AROM | RISK_TPH_C8_C10_ALI | RISK_TPH_C8_C10_AROM | TOTAL_SPLIT_TPH | TPH_C6_C8_6SPLIT | TPH_C8_C10_6SPLIT | TPH_C10_C12_6SPLIT | TPH_C12_C16_6SPLIT | TPH_C16_C21_6SPLIT | TPH_C21_C40_6SPLIT | Comment where RBSL exceeded |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RBSL (mg/kg) | | | 1717 | | | | | | | | | | | | | | | | | | | | | | | 1717 | | | | | | | |
| CE01N | 0.5 | 05/12/2008 | 270 | 45 | ND | 110 | 16 | 3.6 | ND | | | ND | ND | | | 150 | 16 | | ND | | | ND | 0.063 | 0.23 | ND | | | | | | | | |
| CE01S | 0.5 | 05/12/2008 | 67 | 54 | ND | 170 | 22 | 7.7 | 9.5 | | | ND | ND | | | 240 | 31 | | ND | | | ND | 0.014 | 0.53 | ND | | | | | | | | |
| CE02N | 1.5 | 05/12/2008 | 1500 | 55 | ND | 130 | 49 | 42 | 47 | | | 24 | 31 | | | 250 | 130 | | ND | | | ND | 0.014 | 1.7 | ND | | | | | | | | |
| CE02S | 1.5 | 05/12/2008 | 76 | 79 | 12 | 150 | 57 | 60 | 50 | | | 19 | 25 | | | 310 | 140 | | ND | | | ND | 0.017 | 0.42 | ND | | | | | | | | |
| CE03 | 1 | 09/12/2008 | 170 | 9 | ND | 16 | ND | 5.6 | ND | | | ND | ND | | | 30 | ND | | ND | | | ND | ND | 0.12 | ND | | | | | | | | |
| CE04 | 1 | 09/12/2008 | 540 | ND | ND | ND | ND | ND | 9.5 | | | 74 | 190 | | | 74 | 190 | | ND | | | 0.18 | ND | ND | ND | | | | | | | | |
| CE05 | 1 | 09/12/2008 | ND | 8.7 | ND | 20 | ND | 5.8 | ND | | | 33 | ND | | | 67 | ND | | ND | | | ND | ND | 0.18 | ND | | | | | | | | |
| CE06B | 1 | 09/12/2008 | 31 | 360 | 15 | 850 | 160 | 31 | 16 | | | 25 | ND | | | 1300 | 200 | | ND | | | ND | ND | 21 | 0.26 | | | | | | | | |
| CE06N | 1 | 09/12/2008 | ND | 9.4 | ND | 64 | ND | 1.4 | ND | | | ND | ND | | | 76 | ND | | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| CE06S | 1 | 09/12/2008 | 170 | 18 | ND | 65 | ND | 29 | ND | | | 57 | ND | | | 170 | ND | | ND | | | ND | ND | 0.21 | ND | | | | | | | | |
| CE07 | 3 | 09/12/2008 | 270 | 130 | 7.4 | 300 | 49 | 22 | 20 | | | 8.5 | 11 | | | 460 | 87 | | ND | | | ND | ND | 4.7 | 0.14 | | | | | | | | |
| CE08 | 3 | 09/12/2008 | 390 | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.24 | ND | | | | | | | | |
| CE09 | 3 | 09/12/2008 | 460 | 9.5 | ND | 20 | ND | ND | ND | | | ND | ND | | | 31 | ND | | ND | | | ND | ND | 1 | ND | | | | | | | | |
| CE10 | 3 | 09/12/2008 | 30 | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 03/03/2008 | 65 | ND | ND | ND | ND | | 3.8 | 19 | 3.1 | | | 20 | 21 | 37 | 27 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP001 | 0.7 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.26 | 0.14 | | | | | | | | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.18 | ND | | | | | | | | |
| | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| TP004 | 0.95 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| TP009 | 0.45 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.12 | ND | | | | | | | | |
| | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.12 | ND | | | | | | | | |
| TP010 | 1.4 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.16 | ND | | | | | | | | |
| TP014 | 0 | 02/04/2008 | 92 | 1.7 | 2.7 | 2.6 | 3.1 | | 4 | 24 | 31 | | | 5.8 | 18 | 34 | 59 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| TP015 | 0.5 | 03/03/2008 | ND | ND | ND | 3.4 | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| TP021 | 0 | 02/04/2008 | 18 | 1.6 | ND | 2.4 | ND | | ND | 14 | ND | | | ND | ND | 18 | ND | ND | ND | | | 0.17 | ND | 0.17 | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | 270 | ND | ND | ND | ND | | ND | 160 | 62 | | | 31 | 20 | 180 | 82 | ND | ND | | | ND | ND | 0.16 | ND | | | | | | | | |
| TP022 | 0.5 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.16 | ND | | | | | | | | |
| | 0.1 | 03/03/2008 | 6 | ND | ND | 4.1 | 1.9 | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.12 | ND | | | | | | | | |
| TP023 | 0.75 | 03/03/2008 | 14 | ND | ND | 3.6 | ND | | ND | 9.8 | ND | | | ND | ND | 14 | ND | ND | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| TP025 | 0.15 | 05/03/2008 | 22 | ND | ND | ND | ND | | ND | ND | 14 | | | ND | 8.6 | ND | 22 | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.15 | ND | | | | | | | | |
| TP026 | 0.5 | 05/03/2008 | 180 | ND | ND | ND | ND | | 7 | 34 | 53 | | | 28 | 59 | 62 | 110 | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP027 | 0.8 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | 0.14 | ND | | | 0.24 | ND | ND | ND | | | | | | | | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP028 | 0.9 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.12 | ND | | | | | | | | |
| TP030 | 0.15 | 05/03/2008 | 200 | ND | ND | 7.5 | 5.3 | | 14 | 53 | 78 | | | 10 | 38 | 72 | 140 | ND | ND | | | ND | ND | 0.22 | ND | | | | | | | | |
| | 0.2 | 05/03/2008 | 220 | ND | ND | 11 | 4.9 | | 14 | 68 | 77 | | | 9 | 37 | 90 | 140 | ND | ND | | | ND | ND | 0.18 | ND | | | | | | | | |
| TP031 | 0.9 | 05/03/2008 | 310 | 3.1 | ND | 18 | 9.5 | | 27 | 74 | 130 | | | 10 | 49 | 110 | 200 | ND | ND | | | ND | ND | 0.2 | ND | | | | | | | | |
| | 0.14 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP033 | 0.15 | 04/03/2008 | 11 | ND | ND | 4.3 | ND | | ND | 7.2 | ND | | | ND | ND | 11 | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.12 | ND | | | | | | | | |
| TP034 | 1 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.22 | 0.25 | | | | | | | | |
| | 0.1 | 03/03/2008 | 46 | ND | ND | ND | ND | | ND | 13 | 10 | | | 6.9 | 17 | 20 | 26 | ND | ND | | | ND | ND | 0.25 | ND | | | | | | | | |
| TP035 | 0.9 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.22 | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP039 | 0.85 | 04/03/2008 | 25 | ND | 2.6 | ND | 3.8 | | 5.3 | ND | 10 | | | ND | 2.7 | ND | 25 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP040 | 0.05 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.18 | ND | | | | | | | | |
| | 0.1 | 03/03/2008 | 16 | ND | ND | ND | ND | | ND | ND | 8.8 | | | ND | 6.3 | ND | 14 | ND | ND | | | ND | ND | 0.22 | ND | | | | | | | | |
| TP041 | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.25 | 0.12 | | | | | | | | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP042 | 0.55 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| TP044 | 0.8 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| TP045 | 0.6 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| TP046 | 0 | 02/04/2008 | 13 | 3.5 | ND | 2.7 | ND | | ND | 6.8 | ND | | | ND | ND | 13 | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| | 1.3 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP049 | 1.7 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP050 | 0.9 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| TP051 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.11 | ND | | | | | | | | |
| | 0.1 | 03/03/2008 | 20 | ND | ND | ND | ND | | ND | 20 | ND | | | ND | ND | 20 | ND | ND | ND | | | ND | ND | 0.11 | ND | | | | | | | | |
| TP052 | 1.4 | 03/03/2008 | 61 | ND | ND | 7.3 | 7.5 | | 12 | 21 | 13 | | | ND | ND | 28 | 33 | ND | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | 310 | ND | ND | 17 | 4.4 | | 19 | 100 | 73 | | | 34 | 53 | 160 | 150 | ND | ND | | | 0.11 | ND | 0.13 | ND | | | | | | | | |
| TP056 | 1 | 04/03/2008 | 830 | 260 | 8.1 | 470 | 73 | | 6.4 | 14 | ND | | | ND | ND | 740 | 89 | ND | ND | | | ND | ND | 7.1 | 0.38 | | | | | | | | |
| TP057 | 0 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | 0.012 | | | ND | ND | 0.33 | 0.69 | | | | | | | | |
| | 0.15 | 03/03/2008 | 13 | 3.1 | ND | 3.5 | ND | | ND | 6.1 | ND | | | ND | ND | 13 | ND | ND | ND | | | ND | ND | 0.19 | ND | | | | | | | | |
| TP058 | 1 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP059 | 0.1 | 03/03/2008 | 140 | 3.6 | ND | 5.6 | 9.1 | | 26 | 22 | 27 | | | 5.3 | 41 | 38 | 100 | ND | ND | | | 0.13 | ND | 0.35 | ND | | | | | | | | |
| | 0.2 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP063 | 0.85 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP064 | 0 | 05/03/2008 | 540 | 130 | 10 | 300 | 71 | | 11 | 13 | ND | | | ND | ND | 440 | 93 | ND | ND | | | 0.17 | ND | 6.7 | 0.32 | | | | | | | | |
| | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP065 | 0.65 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | 0.32 | ND | 0.58 | ND | | | | | | | | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP071 | 1.2 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP072 | 0.55 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.15 | ND | | | | | | | | |
| TP074 | 0.95 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.12 | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| TP081 | 1.1 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.19 | ND | | | | | | | | |
| TP082 | 0 | 05/03/2008 | 660 | 170 | 12 | 290 | 53 | | 21 | 38 | 34 | | | 3.2 | 11 | 520 | 130 | ND | ND | | | 0.14 | ND | 2.6 | 0.22 | | | | | | | | |
| | 0.15 | 03/03/2008 | 550 | ND | ND | ND | 7.5 | | 20 | 40 | 140 | | | 110 | 230 | 160 | 400 | ND | ND | | | ND | ND | 0.22 | ND | | | | | | | | |
| TP083 | 0.5 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.42 | ND | | | | | | | | |
| TP084 | 0.15 | 03/03/2008 | 130 | 3.7 | ND | 7.4 | 6.6 | | 12 | 35 | 37 | | | 6.5 | 21 | 52 | 75 | ND | ND | | | ND | ND | 0.22 | ND | | | | | | | | |
| TP091 | 0.2 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP092 | 0 | 05/03/2008 | 65 | 19 | ND | 37 | ND | | ND | 8.1 | ND | | | ND | ND | 65 | ND | ND | ND | | | 0.12 | ND | 0.72 | 0.17 | | | | | | | | |
| | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.17 | ND | | | | | | | | |
| TP094 | 0.6 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.17 | ND | | | | | | | | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP102 | 0.7 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP104 | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP112 | 0.65 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP113 | 0 | 05/03/2008 | 190 | 34 | ND | 60 | 19 | | 14 | 32 | 24 | | | 4 | 10 | 130 | 68 | ND | ND | | | ND | ND | 0.47 | 0.15 | | | | | | | | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP123 | 0.95 | 05/03/2008 | 24 | ND | ND | ND | ND | | ND | ND | 18 | | | ND | 6.1 | ND | 24 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP124 | 0 | 05/03/2008 | 80 | 19 | 3.6 | 36 | 12 | | 5.9 | 3.8 | ND | | | ND | ND | 59 | 21 | ND | ND | | | ND | ND | 0.16 | ND | | | | | | | | |
| TP135 | 0 | 05/03/2008 | 28 | 4.8 | ND | 13 | 4.8 | | 5.3 | ND | ND | | | ND | ND | 18 | 10 | ND | ND | | | ND | ND | 0.22 | ND | | | | | | | | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP145 | 0.85 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP146 | 0 | 05/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP156 | 0 | 05/03/2008 | 79 | 13 | ND | 39 | 8 | | 5.4 | ND | 11 | | | ND | 2 | 53 | 27 | ND | ND | | | ND | ND | 0.12 | ND | | | | | | | | |
| TP171 | 0.2 | 10/04/2008 | 59 | ND | ND | 4.4 | ND | 7.2 | 8.4 | | | 18 | 22 | | | 30 | 29 | | ND | | | 0.17 | ND | 0.2 | ND | | | | | | | | |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | 0.15 | ND | ND | ND | | | | | | | | |
| TP180 | 1.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 09/04/2008 | 9.5 | ND | ND | 2.2 | ND | ND | 7.1 | | | ND | ND | | | ND | 7.1 | | ND | | | 0.19 | ND | ND | ND | | | | | | | | |
| | 0.8 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | 0.11 | ND | ND | ND | | | | | | | | |
| TP182 | 1.1 | 09/04/2008 | ND | ND | ND | 1.9 | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP205 | 1.1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | 0.3 | ND | 0.4 | ND | | | | | | | | |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP206 | 1.4 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | 0.36 | ND | 0.49 | ND | | | | | | | | |
| TP207 | 0.2 | 09/04/2008 | 31 | ND | ND | 3.1 | ND | ND | 11 | | | ND | 15 | | | ND | 26 | | ND | | | 0.52 | ND | 0.83 | ND | | | | | | | | |
| | 0.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | 1.1 | ND | 1.4 | ND | | | | | | | | |
| | 0.8 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | 0.26 | ND | 0.32 | ND | | | | | | | | |
| TP217 | 1.1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | 0.16 | ND | 0.19 | ND | | | | | | | | |
| TP218 | 1.6 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 09/04/2008 | 58 | 2.6 | ND | 3 | ND | 3.5 | 11 | | | 12 | 25 | | | 22 | 36 | | ND | | | 0.29 | ND | 0.36 | ND | | | | | | | | |
| TP219 | 1.1 | 09/04/2008 | 60 | ND | ND | 2.2 | ND | 3.7 | 10 | | | 14 | 29 | | | 21 | 39 | | ND | | | 0.28 | ND | 0.38 | ND | | | | | | | | |
| | 0.2 | 09/04/2008 | 110 | ND | ND | 3.2 | 6.1 | 7 | 14 | | | 22 | 56 | | | 32 | 76 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP230 | 1.2 | 09/04/2008 | 32 | 2.6 | ND | 2.8 | ND | 3 | 8.8 | | | 4.8 | 9.8 | | | 14 | 18 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.2 | 09/04/2008 | 27 | ND | ND | ND | ND | ND | 7.1 | | | 5.1 | 15 | | | ND | 22 | | ND | | | ND | ND | ND | ND | | | | | | | | |

ND - not detected above the method detection limit

| Chem Class | TPH |
|---|---|

| Location | Depth | Sample_Date | TOTAL_RISK_TPH | RISK_TPH_C10_C12_ALI | RISK_TPH_C10_C12_AROM | RISK_TPH_C12_C16_ALI | RISK_TPH_C12_C16_AROM | RISK_TPH_C16_C21_ALI | RISK_TPH_C16_C21_AROM | RISK_TPH_C16_C35_ALI | RISK_TPH_C21_C35_AROM | RISK_TPH_C21_C40_ALI | RISK_TPH_C21_C40_AROM | RISK_TPH_C35_C44_ALI | RISK_TPH_C35_C44_AROM | RISK_TPH_C5_C44_ALI | RISK_TPH_C5_C44_ARO | RISK_TPH_C5_C6_ALI | RISK_TPH_C5_C7_ARO | RISK_TPH_C6_C40_ALI | RISK_TPH_C6_C40_AROM | RISK_TPH_C6_C8_ALI | RISK_TPH_C7_C8_AROM | RISK_TPH_C8_C10_ALI | RISK_TPH_C8_C10_AROM | TOTAL_SPLIT_TPH | TPH_C6_C8_6SPLIT | TPH_C8_C10_6SPLIT | TPH_C10_C12_6SPLIT | TPH_C12_C16_6SPLIT | TPH_C16_C21_6SPLIT | TPH_C21_C40_6SPLIT | Comment where RBSL exceeded |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RBSL (mg/kg) | | | 1717 | | | | | | | | | | | | | | | | | | | | | | | 1717 | | | | | | | |
| TP236 | 0.9 | 09/04/2008 | 29 | ND | ND | ND | ND | ND | 6.9 | | | 5.1 | 17 | | | 6 | 24 | | ND | | | 0.13 | ND | 0.75 | ND | | | | | | | | |
| TP236E | 0 | 02/07/2008 | 24 | ND | ND | ND | 3.1 | ND | 4.2 | | | 3.2 | 13 | | | ND | 20 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.2 | 10/04/2008 | 31 | ND | ND | 2.7 | 5.1 | 3.1 | 7.8 | | | 2.8 | 8.6 | | | 8.9 | 21 | | ND | | | 0.2 | ND | ND | ND | | | | | | | | |
| | 1 | 10/04/2008 | ND | ND | ND | 2.3 | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.7 | 10/04/2008 | 14 | ND | ND | 2.2 | 5.1 | ND | 7 | | | ND | ND | | | ND | 12 | | ND | | | ND | ND | 0.41 | ND | | | | | | | | |
| TP242 | 2.1 | 10/04/2008 | 16 | ND | ND | 2.6 | ND | 2.7 | 6.9 | | | 2.8 | ND | | | 9 | 6.9 | | ND | | | 0.43 | ND | 0.45 | ND | | | | | | | | |
| | 0.2 | 09/04/2008 | 19 | ND | ND | ND | ND | ND | ND | | | ND | 19 | | | ND | 19 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.2 | 09/04/2008 | 27 | ND | ND | ND | ND | ND | 6.4 | | | ND | 21 | | | ND | 27 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.7 | 09/04/2008 | 31 | ND | ND | ND | ND | ND | 7.6 | | | ND | 24 | | | ND | 31 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP243 | 2.4 | 09/04/2008 | 34 | ND | ND | 5.2 | ND | ND | 5.7 | | | ND | 23 | | | ND | 28 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.2 | 09/04/2008 | 580 | ND | ND | 5.1 | 19 | 7.1 | 110 | | | 32 | 410 | | | 45 | 540 | | ND | | | ND | ND | 0.29 | ND | | | | | | | | |
| TP244 | 0.8 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.2 | 10/04/2008 | 11 | ND | ND | 2.9 | ND | ND | 6.6 | | | ND | ND | | | ND | 6.6 | | ND | | | 0.37 | ND | 0.62 | ND | | | | | | | | |
| TP247 | 0.9 | 10/04/2008 | ND | ND | ND | 3.2 | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | 0.32 | ND | 0.36 | ND | | | | | | | | |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | 0.28 | ND | 0.39 | ND | | | | | | | | |
| TP248 | 1.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.3 | 10/04/2008 | 19 | ND | ND | 3 | 5.3 | 3 | 7.5 | | | ND | ND | | | 6.5 | 13 | | ND | | | 0.2 | ND | 0.17 | ND | | | | | | | | |
| | 1 | 10/04/2008 | 16 | ND | ND | 2.7 | 4.5 | 2.5 | 6.2 | | | ND | ND | | | 5.5 | 11 | | ND | | | 0.15 | ND | 0.25 | ND | | | | | | | | |
| TP249 | 1.7 | 10/04/2008 | 14 | ND | ND | 2 | 4.7 | ND | 6.3 | | | ND | ND | | | ND | 11 | | ND | | | 0.33 | ND | 0.55 | ND | | | | | | | | |
| | 0.2 | 10/04/2008 | 24 | ND | ND | 2.4 | ND | 2.3 | 7.4 | | | ND | 12 | | | ND | 19 | | ND | | | 0.23 | ND | 0.34 | ND | | | | | | | | |
| TP252 | 0.5 | 10/04/2008 | 57 | ND | ND | 2.3 | 6.2 | 2.5 | 13 | | | 4.1 | 28 | | | 9.4 | 48 | | ND | | | 0.16 | ND | 0.31 | ND | | | | | | | | |
| MS189 | 1.5 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| TP002 | 0.1 | 20/05/2009 | | | | | | | | | | | | | | | | | | | | | | | | 58 | ND | ND | ND | ND | ND | 58 | |
| | 0.1 | 20/05/2009 | | | | | | | | | | | | | | | | | | | | | | | | 38 | ND | ND | ND | ND | ND | 38 | |
| TP003 | 0.7 | 20/05/2009 | | | | | | | | | | | | | | | | | | | | | | | | 140 | ND | ND | ND | ND | 7.2 | 130 | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP006 | 0.6 | 04/03/2008 | 5.7 | ND | ND | ND | ND | | ND | 5.7 | ND | | | ND | ND | 5.7 | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | 5.8 | ND | ND | ND | ND | | ND | 5.8 | ND | | | ND | ND | 5.8 | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP007 | 1 | 04/03/2008 | 140 | ND | ND | ND | ND | | ND | 20 | 73 | | | 3 | 47 | 23 | 120 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | 34 | ND | ND | ND | ND | | 7.3 | 8.3 | 16 | | | ND | 2.4 | 8.3 | 26 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP008 | 0.5 | 04/03/2008 | 60 | ND | ND | ND | ND | | 7.4 | 18 | 26 | | | 3.3 | 4.7 | 21 | 38 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | 4.6 | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP011 | 0.6 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | 4.4 | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | 100 | ND | ND | 1.7 | 6.5 | | 12 | 20 | 44 | | | ND | 18 | 21 | 80 | ND | ND | | | 0.2 | ND | ND | ND | | | | | | | | |
| TP012 | 0.5 | 04/03/2008 | 38 | ND | ND | ND | ND | | 6.3 | 9.4 | 17 | | | ND | 5.2 | 9.4 | 28 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP013 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | 0.12 | ND | ND | ND | | | | | | | | |
| TP017 | 0.1 | 20/05/2009 | | | | | | | | | | | | | | | | | | | | | | | | **2200** | ND | 3.6 | 3.4 | 16 | 120 | 2100 | Excavated to rock 29/6/09 |
| TP018 | 0.15 | 04/03/2008 | 86 | ND | ND | 2.6 | 7.4 | | 8.8 | 19 | 30 | | | ND | 18 | 21 | 63 | ND | ND | | | 0.12 | ND | ND | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | 8.2 | ND | ND | ND | ND | | ND | ND | 8 | | | ND | ND | ND | 8 | ND | ND | | | 0.18 | ND | 0.15 | ND | | | | | | | | |
| TP019 | 0.4 | 04/03/2008 | 18 | ND | ND | ND | ND | | 8.6 | ND | 9.8 | | | ND | ND | ND | 18 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | 16 | ND | ND | ND | ND | | 8.1 | ND | 8.6 | | | ND | ND | ND | 16 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP020 | 0.75 | 04/03/2008 | 11 | ND | ND | ND | ND | | 5.5 | ND | 6 | | | ND | ND | ND | 11 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP024 | 0.1 | 20/05/2009 | | | | | | | | | | | | | | | | | | | | | | | | 290 | ND | 2 | 1.4 | 4.9 | 17 | 270 | |
| TP029 | 0.1 | 20/05/2009 | | | | | | | | | | | | | | | | | | | | | | | | ND | ND | ND | ND | 2.5 | ND | ND | |
| TP032 | 0.15 | 04/03/2008 | 15 | ND | ND | ND | 6.6 | | 8.1 | ND | ND | | | ND | ND | ND | 15 | ND | ND | | | 0.13 | ND | ND | ND | | | | | | | | |
| TP036 | 0.1 | 10/12/2008 | 250 | 4.3 | ND | 17 | 17 | 23 | 24 | | | 36 | 130 | | | 81 | 170 | | ND | | | 0.15 | ND | 0.15 | ND | | | | | | | | |
| TP037 | 0.15 | 04/03/2008 | 430 | ND | 3.7 | 3.7 | 8.2 | | 22 | 120 | 110 | | | 93 | 83 | 210 | 220 | ND | ND | | | 0.13 | ND | 0.12 | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP038 | 0.9 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP040 | 0.1 | 01/12/2008 | 410 | ND | ND | ND | 11 | 6 | 16 | | | 140 | 230 | | | 150 | 250 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP042 | 0.1 | 01/12/2008 | 130 | ND | ND | ND | ND | ND | 7.4 | | | 46 | 80 | | | 46 | 87 | | ND | | | ND | 0.027 | ND | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | 71 | ND | ND | 1.7 | ND | | 7 | 13 | 27 | | | 6.9 | 16 | 22 | 49 | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP043 | 0.95 | 04/03/2008 | 21 | 4.6 | ND | 12 | ND | | ND | 4.1 | ND | | | ND | ND | 21 | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP047 | 0.1 | 01/12/2008 | 51 | ND | ND | 9.7 | ND | 10 | ND | | | 30 | ND | | | 51 | ND | | ND | | | 0.13 | 0.016 | 0.12 | ND | | | | | | | | |
| TP048 | 0.1 | 16/01/2009 | | | | | | | | | | | | | | | | | | | | | | | | 35 | ND | 1.7 | ND | 3.3 | ND | 29 | |
| TP053 | 0.1 | 03/12/2008 | 240 | ND | ND | ND | ND | ND | ND | | | 60 | 190 | | | 60 | 190 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP054 | 0.1 | 01/12/2008 | 480 | ND | ND | 9.4 | ND | 23 | 20 | | | 150 | 280 | | | 180 | 300 | | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP055 | 2 | 04/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP060 | 0.1 | 01/12/2008 | 130 | ND | ND | ND | ND | ND | ND | | | 60 | 69 | | | 60 | 69 | | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| TP061 | 0.1 | 01/12/2008 | 120 | ND | ND | ND | ND | ND | ND | | | 40 | 80 | | | 40 | 80 | | ND | | | ND | 0.014 | 0.19 | ND | | | | | | | | |
| | 0.1 | 16/01/2009 | | | | | | | | | | | | | | | | | | | | | | | | 270 | ND | ND | 14 | 38 | 24 | 190 | |
| | 0.7 | 01/12/2008 | 38 | 9.7 | ND | 29 | ND | ND | ND | | | ND | ND | | | 38 | ND | | ND | | | ND | ND | 0.21 | ND | | | | | | | | |
| TP062 | 1.2 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 01/12/2008 | 280 | ND | ND | 13 | 12 | 21 | 23 | | | 83 | 130 | | | 120 | 160 | | ND | | | ND | 0.013 | ND | ND | | | | | | | | |
| TP068 | 0.5 | 01/12/2008 | 150 | ND | ND | 8.3 | 6.8 | 13 | 16 | | | 41 | 66 | | | 63 | 88 | | ND | | | ND | 0.014 | 0.15 | ND | | | | | | | | |
| TP069 | 0.1 | 01/12/2008 | 110 | 3.2 | ND | 7.5 | ND | 7.2 | ND | | | 46 | 47 | | | 65 | 47 | | ND | | | ND | 0.038 | ND | ND | | | | | | | | |
| TP070 | 0.1 | 01/12/2008 | 380 | ND | ND | 5.3 | ND | 15 | 16 | | | 160 | 190 | | | 180 | 200 | | ND | | | ND | 0.031 | 0.12 | ND | | | | | | | | |
| TP073 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP077 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP078 | 0.7 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| TP079 | 0.1 | 01/12/2008 | 220 | ND | ND | 4.5 | ND | 12 | 11 | | | 86 | 110 | | | 100 | 120 | | ND | | | ND | 0.015 | ND | ND | | | | | | | | |
| | 0.1 | 01/12/2008 | 350 | 38 | 9.2 | 82 | 25 | 15 | 13 | | | 64 | 100 | | | 200 | 140 | | ND | | | ND | ND | 3.3 | ND | | | | | | | | |
| | 0.7 | 01/12/2008 | 890 | 270 | 27 | 430 | 120 | 9.8 | 12 | | | ND | ND | | | 730 | 170 | | ND | | | ND | ND | 27 | 0.18 | | | | | | | | |
| TP080 | 1.2 | 01/12/2008 | **2000** | 650 | 69 | 920 | 250 | 17 | 12 | | | ND | ND | | | 1700 | 330 | | ND | | | 0.31 | ND | 97 | 0.29 | | | | | | | | Excavated to rock - no further excavation possible |
| TP087 | 0.1 | 01/12/2008 | 120 | ND | ND | ND | ND | ND | ND | | | 49 | 67 | | | 49 | 67 | | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| TP088 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.02 | ND | ND | | | | | | | | |
| TP089 | 0.1 | 02/12/2008 | 150 | ND | ND | 3.7 | ND | 12 | 7.4 | | | 64 | 62 | | | 79 | 68 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 01/12/2008 | 550 | 160 | 10 | 280 | 74 | 9 | 8.3 | | | ND | ND | | | 460 | 92 | | ND | | | ND | ND | 16 | ND | | | | | | | | |
| TP090 | 1.2 | 01/12/2008 | 190 | 44 | 2.7 | 100 | 21 | 3.3 | 4.2 | | | ND | ND | | | 160 | 29 | | ND | | | ND | ND | 13 | ND | | | | | | | | |
| TP093 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| TP098 | 0.1 | 02/12/2008 | 27 | ND | ND | ND | ND | ND | ND | | | ND | 27 | | | ND | 27 | | ND | | | ND | ND | 0.82 | ND | | | | | | | | |
| TP099 | 0.1 | 09/12/2008 | 40 | ND | ND | ND | ND | ND | ND | | | 17 | 23 | | | 17 | 23 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 01/12/2008 | 250 | 3.8 | ND | 8.9 | ND | 18 | ND | | | 140 | 82 | | | 180 | 82 | | ND | | | ND | ND | 0.15 | ND | | | | | | | | |
| TP100 | 0.7 | 01/12/2008 | 23 | 5.4 | ND | 18 | ND | ND | ND | | | ND | ND | | | 23 | ND | | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| TP101 | 0.1 | 10/12/2008 | 100 | ND | ND | ND | ND | 2.2 | ND | | | 53 | 47 | | | 55 | 47 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP103 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | 0.16 | ND | 0.18 | ND | | | | | | | | |
| TP107 | 0.1 | 01/12/2008 | 340 | ND | ND | 9.7 | 4.5 | 23 | 16 | | | 110 | 180 | | | 140 | 200 | | ND | | | ND | 0.014 | 0.25 | ND | | | | | | | | |
| TP108 | 0.1 | 02/12/2008 | 490 | 2.3 | ND | 6 | ND | 14 | 11 | | | 220 | 250 | | | 230 | 260 | | ND | | | ND | ND | 0.15 | ND | | | | | | | | |
| TP109 | 0.1 | 03/12/2008 | 170 | ND | ND | 3.3 | ND | 15 | 8.4 | | | 87 | 56 | | | 100 | 65 | | ND | | | ND | 0.022 | ND | ND | | | | | | | | |
| | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP110 | 1.4 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 10/12/2008 | 260 | 48 | ND | 130 | 16 | 22 | ND | | | 45 | ND | | | 250 | 16 | | ND | | | ND | ND | 0.44 | ND | | | | | | | | |
| | 0.7 | 10/12/2008 | 1000 | 330 | 14 | 550 | 110 | 23 | 17 | | | 13 | ND | | | 920 | 140 | | ND | | | ND | ND | 5.5 | 0.17 | | | | | | | | |
| TP111 | 1.4 | 10/12/2008 | 470 | 140 | 17 | 230 | 65 | 6.9 | 7 | | | ND | ND | | | 380 | 89 | | ND | | | ND | ND | 3.8 | 0.15 | | | | | | | | |
| TP114 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.1 | ND | | | | | | | | |
| TP119 | 0.1 | 01/12/2008 | 160 | 10 | ND | 36 | ND | 18 | ND | | | 49 | 46 | | | 110 | 46 | | ND | | | ND | 0.013 | 0.16 | ND | | | | | | | | |
| TP120 | 0.1 | 02/12/2008 | 24 | ND | ND | ND | ND | ND | ND | | | ND | 24 | | | ND | 24 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP121 | 0.1 | 02/12/2008 | 70 | ND | ND | 2.5 | ND | 5.5 | ND | | | 28 | 33 | | | 36 | 33 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP122 | 0.1 | 10/12/2008 | 350 | 82 | 9.5 | 140 | 32 | 5.8 | 5.1 | | | 33 | 46 | | | 270 | 91 | | ND | | | ND | ND | 2 | ND | | | | | | | | |
| TP125 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP126 | 0.85 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP130 | 0.1 | 01/12/2008 | 1100 | 4.8 | ND | 40 | 24 | 58 | 73 | | | 350 | 590 | | | 450 | 690 | | 0.014 | | | ND | 0.024 | 0.31 | ND | | | | | | | | |
| TP131 | 0.1 | 02/12/2008 | 200 | ND | ND | 6.7 | ND | 11 | 9.1 | | | 79 | 100 | | | 97 | 110 | | ND | | | ND | 0.013 | 0.11 | ND | | | | | | | | |
| | 0.1 | 02/12/2008 | 670 | 7.7 | ND | 33 | 7.5 | 33 | 22 | | | 250 | 310 | | | 330 | 340 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP132 | 0.7 | 01/12/2008 | 53 | ND | ND | ND | ND | ND | ND | | | 23 | 29 | | | 23 | 29 | | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| | 0.1 | 02/12/2008 | 110 | 19 | ND | 17 | ND | 3.9 | ND | | | 30 | 41 | | | 71 | 41 | | ND | | | ND | ND | 0.66 | ND | | | | | | | | |
| | 0.7 | 02/12/2008 | 150 | 38 | ND | 95 | 13 | 2.6 | ND | | | ND | ND | | | 140 | 13 | | ND | | | ND | ND | 1.4 | ND | | | | | | | | |
| TP133 | 1.5 | 02/12/2008 | 74 | 25 | ND | 43 | 7.1 | ND | ND | | | ND | ND | | | 67 | 7.1 | | ND | | | ND | ND | 0.46 | ND | | | | | | | | |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 09/12/2008 | 330 | ND | ND | 4.4 | 12 | 6 | 60 | | | 14 | 240 | | | 25 | 310 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP134 | 1.4 | 09/12/2008 | 28 | ND | ND | ND | ND | ND | 4.8 | | | ND | 24 | | | ND | 28 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP136 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP137 | 0.85 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 01/12/2008 | 59 | ND | ND | ND | ND | ND | ND | | | 27 | 30 | | | 27 | 30 | | ND | | | ND | 0.016 | 0.15 | ND | | | | | | | | |
| TP141 | 0.1 | 02/12/2008 | 81 | ND | ND | ND | ND | ND | ND | | | 41 | 40 | | | 41 | 40 | | ND | | | ND | 0.035 | 0.13 | ND | | | | | | | | |
| TP142 | 0.1 | 01/12/2008 | 670 | ND | ND | 3.4 | ND | 15 | 9.7 | | | 300 | 340 | | | 310 | 350 | | ND | | | ND | 0.015 | 0.11 | ND | | | | | | | | |
| | 0.1 | 10/12/2008 | 230 | ND | ND | ND | ND | 9.4 | 8.8 | | | 93 | 110 | | | 100 | 130 | | ND | | | ND | 0.018 | 0.16 | ND | | | | | | | | |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP143 | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 09/12/2008 | 260 | 48 | 13 | 16 | 8.5 | 13 | 11 | | | 70 | 86 | | | 150 | 110 | | ND | | | ND | ND | 1.4 | 0.4 | | | | | | | | |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.4 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP144 | 2.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.11 | ND | | | | | | | | |
| TP147 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.17 | ND | | | | | | | | |
| TP151 | 0.1 | 01/12/2008 | 440 | 20 | ND | 95 | 29 | 61 | 55 | | | 70 | 100 | | | 250 | 180 | | ND | | | ND | ND | 0.27 | ND | | | | | | | | |
| | 0.1 | 03/12/2008 | 880 | ND | ND | ND | ND | 12 | 9.6 | | | 450 | 410 | | | 460 | 420 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP152 | 0.7 | 03/12/2008 | 130 | ND | ND | ND | ND | ND | ND | | | 78 | 51 | | | 78 | 51 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |

ND - not detected above the method detection limit

**Table 3b - Total Petroleum Hydrocarbon (TPH) Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | TPH |
|---|---|

| RBSL (mg/kg) | | | 1717 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 1717 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | TOTAL_RISK_TPH | RISK_TPH_C10_C12_ALI | RISK_TPH_C10_C12_AROM | RISK_TPH_C12_C16_ALI | RISK_TPH_C12_C16_AROM | RISK_TPH_C16_C21_ALI | RISK_TPH_C16_C21_AROM | RISK_TPH_C16_C35_ALI | RISK_TPH_C21_C35_AROM | RISK_TPH_C21_C40_ALI | RISK_TPH_C21_C40_AROM | RISK_TPH_C35_C44_ALI | RISK_TPH_C35_C44_AROM | RISK_TPH_C5_C44_ALI | RISK_TPH_C5_C44_ARO | RISK_TPH_C5_C6_ALI | RISK_TPH_C5_C7_ARO | RISK_TPH_C6_C40_ALI | RISK_TPH_C6_C40_AROM | RISK_TPH_C6_C8_ALI | RISK_TPH_C7_C8_AROM | RISK_TPH_C8_C10_ALI | RISK_TPH_C8_C10_AROM | TOTAL_SPLIT_TPH | TPH_C6_C8_6SPLIT | TPH_C8_C10_6SPLIT | TPH_C10_C12_6SPLIT | TPH_C12_C16_6SPLIT | TPH_C16_C21_6SPLIT | TPH_C21_C40_6SPLIT | Comment where RBSL exceeded |
| | 0.7 | 10/12/2008 | 480 | ND | ND | 5.5 | 6.5 | 15 | 13 | | | 200 | 230 | | | 230 | 250 | | ND | | | 0.25 | ND | ND | ND | | | | | | | | | | |
| TP153 | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP154 | 0.1 | 09/12/2008 | 280 | 4.4 | ND | 12 | ND | 13 | 12 | | | 100 | 130 | | | 130 | 140 | | ND | | | 0.18 | ND | 0.24 | ND | | | | | | | | | | |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP155 | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP157 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP158 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP162 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.012 | ND | ND | | | | | | | | | | |
| | 0.1 | 05/12/2008 | 84 | ND | ND | ND | ND | ND | ND | | | 40 | 44 | | | 40 | 44 | | ND | | | ND | ND | 0.17 | ND | | | | | | | | | | |
| | 0.7 | 05/12/2008 | 74 | ND | ND | ND | ND | ND | ND | | | 36 | 38 | | | 36 | 38 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP163 | 1.4 | 05/12/2008 | 200 | ND | ND | 4.8 | ND | 9.2 | 6.4 | | | 80 | 100 | | | 94 | 110 | | ND | | | ND | ND | 0.13 | ND | | | | | | | | | | |
| | 0.1 | 10/12/2008 | 460 | 38 | 7.4 | 150 | 74 | 65 | 88 | | | 15 | 20 | | | 270 | 190 | | ND | | | ND | ND | 0.94 | ND | | | | | | | | | | |
| | 0.7 | 10/12/2008 | 2500 | 270 | 37 | 770 | 480 | 360 | 430 | | | 48 | 62 | | | 1400 | 1000 | | ND | | | 0.13 | ND | 3 | ND | | | | | | | | | | Excavated 30Sep09, sampled and passed |
| TP164 | 1.4 | 10/12/2008 | 430 | 34 | 8.1 | 120 | 68 | 60 | 87 | | | 17 | 20 | | | 240 | 190 | | ND | | | 0.64 | ND | 6.6 | 0.14 | | | | | | | | | | |
| TP164 W | 0.7 | 30/09/2009 | 770 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TP164 N | 0.7 | 30/09/2009 | ND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TP164 S | 0.7 | 30/09/2009 | 120 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TP164 E | 0.7 | 30/09/2009 | ND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TP164 Base | - | 30/09/2009 | ND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0.1 | 04/12/2008 | 110 | ND | ND | 11 | ND | 50 | 12 | | | 21 | 17 | | | 82 | 28 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP165 | 0.7 | 09/12/2008 | 2900 | 910 | 15 | 1500 | 220 | 23 | 15 | | | ND | ND | | | 2600 | 250 | | ND | | | 1.1 | ND | 220 | ND | | | | | | | | | | Excavated 30Sep09 |
| TP165 W | 0.7 | 30/09/2009 | 260 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 0.7 | 30/09/2009 | 2200 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Excavated 30Sep & 12Oct, sampled and passed |
| TP165 N | 0.7 | 12/10/2009 | ND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TP165 S | 0.7 | 30/09/2009 | 220 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TP165 E | 0.7 | 30/09/2009 | 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TP165 Base | - | 30/09/2009 | ND | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TP166 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP167 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP168 | 0.7 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | ND | ND | ND | ND | ND | ND | | | | | | | | | | |
| TP171 | 0.1 | 16/01/2009 | | | | | | | | | | | | | | | | | | | | | | | | 870 | ND | 2.3 | 3.3 | 42 | 140 | 680 | | |
| | 0.1 | 04/12/2008 | 6000 | 330 | 99 | 1300 | 830 | 890 | 850 | | | 770 | 740 | | | 3400 | 2500 | | ND | | | 52 | 0.056 | 150 | 2.6 | | | | | | | | | | Excavated to rock 20/5/09 |
| | 0.1 | 16/01/2009 | | | | | | | | | | | | | | | | | | | | | | | | 110 | ND | 1.7 | 1.2 | 5.3 | 30 | 73 | | |
| TP172 | 0.7 | 04/12/2008 | 5500 | 210 | 29 | 1400 | 590 | 1300 | 1200 | | | 290 | 380 | | | 3400 | 2200 | | ND | | | 38 | 0.044 | 150 | 2.3 | | | | | | | | | | Excavated to rock 20/5/09 |
| | 0.1 | 03/12/2008 | 45 | ND | ND | 3.5 | ND | 15 | ND | | | 26 | ND | | | 45 | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP173 | 1.4 | 03/12/2008 | 260 | 18 | ND | 71 | 28 | 58 | 54 | | | 13 | 14 | | | 160 | 95 | | ND | | | ND | ND | 1.1 | ND | | | | | | | | | | |
| TP174 | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 10/12/2008 | 780 | 52 | 7 | 230 | 95 | 140 | 150 | | | 38 | 59 | | | 470 | 310 | | ND | | | ND | ND | 0.79 | ND | | | | | | | | | | |
| TP175 | 0.7 | 10/12/2008 | 120 | 7.1 | ND | 18 | 16 | 6.4 | 12 | | | 23 | 41 | | | 55 | 69 | | ND | | | ND | ND | 0.51 | ND | | | | | | | | | | |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP176 | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.12 | ND | | | | | | | | | | |
| TP177 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP178 | 0.7 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.9 | 06/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | | | |
| TP179 | 1.4 | 06/03/2008 | ND | ND | ND | ND | ND | | ND | ND | ND | | | ND | ND | ND | ND | ND | ND | | | ND | ND | 0.14 | ND | | | | | | | | | | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP182 | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 04/12/2008 | 610 | 7.9 | ND | 38 | 16 | 53 | 43 | | | 170 | 280 | | | 270 | 340 | | ND | | | ND | 0.019 | 0.14 | ND | | | | | | | | | | |
| | 0.7 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.7 | 04/12/2008 | 390 | 16 | ND | 70 | 25 | 120 | 62 | | | 55 | 40 | | | 260 | 130 | | ND | | | ND | ND | 0.17 | ND | | | | | | | | | | |
| TP183 | 1.4 | 04/12/2008 | 270 | 6.8 | ND | 38 | 19 | 85 | 50 | | | 42 | 30 | | | 170 | 99 | | ND | | | ND | ND | 0.17 | ND | | | | | | | | | | |
| | 0.1 | 04/12/2008 | 96 | ND | ND | 17 | 3 | 33 | 21 | | | 11 | 11 | | | 61 | 35 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.7 | 04/12/2008 | 780 | 250 | 11 | 360 | 82 | 30 | 21 | | | 11 | 11 | | | 660 | 120 | | ND | | | ND | ND | 4 | ND | | | | | | | | | | |
| | 1.4 | 04/12/2008 | 32 | 4.1 | ND | 17 | ND | 11 | ND | | | ND | ND | | | 32 | ND | | ND | | | ND | 0.021 | 0.17 | ND | | | | | | | | | | |
| TP184 | 2.1 | 04/12/2008 | 210 | 12 | ND | 72 | 21 | 47 | 41 | | | 9 | 9.6 | | | 140 | 71 | | ND | | | ND | ND | 0.38 | ND | | | | | | | | | | |
| | 0.7 | 04/12/2008 | 68 | ND | ND | 9 | ND | 25 | 9.2 | | | 9.3 | 17 | | | 43 | 27 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP185 | 2.1 | 04/12/2008 | 430 | 22 | 6.4 | 120 | 56 | 89 | 91 | | | 20 | 29 | | | 250 | 180 | | ND | | | ND | ND | 0.31 | ND | | | | | | | | | | |
| | 0.1 | 03/12/2008 | 290 | 16 | 1.7 | 86 | 39 | 61 | 54 | | | 11 | 12 | | | 170 | 110 | | ND | | | ND | ND | 1.5 | ND | | | | | | | | | | |
| TP186 | 0.7 | 03/12/2008 | 760 | 78 | 8.4 | 230 | 110 | 130 | 120 | | | 21 | 25 | | | 500 | 270 | | ND | | | 1 | ND | 22 | 0.24 | | | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP187 | 0.7 | 04/12/2008 | 210 | ND | ND | ND | ND | ND | ND | | | 110 | 98 | | | 110 | 98 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 05/12/2008 | 67 | ND | ND | 6.9 | ND | 10 | ND | | | 49 | ND | | | 67 | ND | | ND | | | ND | 0.02 | ND | ND | | | | | | | | | | |
| TP188 | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.039 | ND | ND | | | | | | | | | | |
| TP189 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.14 | ND | | | | | | | | | | |
| TP190 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.19 | ND | | | | | | | | | | |
| TP191 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP192 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP193 | 0.15 | 06/03/2008 | ND | ND | ND | 1.2 | ND | 2.4 | ND | | | 1.3 | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 03/12/2008 | 250 | ND | ND | 4.3 | 14 | 15 | 23 | | | 63 | 130 | | | 82 | 170 | | ND | | | ND | ND | 0.14 | ND | | | | | | | | | | |
| | 0.7 | 03/12/2008 | 250 | ND | ND | 7.6 | ND | 20 | 18 | | | 98 | 110 | | | 120 | 130 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 1.4 | 03/12/2008 | 110 | ND | ND | ND | ND | 9.4 | ND | | | 41 | 56 | | | 51 | 56 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP196 | 2.1 | 03/12/2008 | 31 | ND | ND | ND | ND | ND | ND | | | 31 | ND | | | 31 | ND | | ND | | | ND | ND | 0.11 | ND | | | | | | | | | | |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP197 | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 05/12/2008 | 97 | ND | ND | ND | 5.8 | ND | ND | | | 37 | 53 | | | 43 | 53 | | ND | | | ND | 0.021 | ND | ND | | | | | | | | | | |
| | 0.7 | 05/12/2008 | 200 | ND | ND | ND | ND | ND | 6.8 | | | 52 | 140 | | | 52 | 150 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP198 | 1.4 | 05/12/2008 | 88 | ND | ND | ND | ND | 6 | ND | | | 34 | 48 | | | 40 | 48 | | ND | | | ND | 0.064 | ND | ND | | | | | | | | | | |
| | 0.1 | 05/12/2008 | 530 | 250 | 6.6 | 140 | 27 | 19 | 30 | | | 27 | 16 | | | 450 | 78 | | ND | | | 0.13 | 0.02 | 1.8 | ND | | | | | | | | | | |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.014 | ND | ND | | | | | | | | | | |
| TP199 | 1.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.022 | ND | ND | | | | | | | | | | |
| | 0.1 | 09/12/2008 | 170 | 7.9 | ND | 60 | 13 | 41 | 34 | | | 7.2 | 7.7 | | | 120 | 53 | | ND | | | ND | ND | 0.64 | ND | | | | | | | | | | |
| | 0.7 | 09/12/2008 | 320 | 24 | ND | 110 | 41 | 64 | 54 | | | 9 | 8.8 | | | 210 | 100 | | ND | | | ND | ND | 1.4 | ND | | | | | | | | | | |
| TP200 | 1.4 | 09/12/2008 | 71 | 8 | ND | 25 | 9.7 | 15 | 13 | | | ND | ND | | | 49 | 23 | | ND | | | ND | ND | 1.1 | ND | | | | | | | | | | |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP201 | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.14 | ND | | | | | | | | | | |
| TP202 | 1.3 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP203 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.21 | ND | | | | | | | | | | |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP204 | 0.85 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.15 | ND | | | | | | | | | | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP206 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP207 | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 03/12/2008 | 500 | ND | ND | 16 | 17 | 40 | 34 | | | 160 | 240 | | | 220 | 300 | | ND | | | ND | ND | 0.19 | ND | | | | | | | | | | |
| | 0.7 | 03/12/2008 | 400 | ND | ND | ND | 19 | 16 | 28 | | | 88 | 260 | | | 100 | 300 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP208 | 2.1 | 03/12/2008 | 97 | ND | ND | ND | 4.4 | 5 | 5.9 | | | 31 | 51 | | | 35 | 63 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 03/12/2008 | 130 | ND | ND | ND | ND | 14 | ND | | | 62 | 56 | | | 76 | 56 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 1.4 | 03/12/2008 | 19 | 6.2 | ND | 12 | ND | ND | ND | | | ND | ND | | | 19 | ND | | ND | | | ND | ND | 0.26 | ND | | | | | | | | | | |
| | 2.1 | 03/12/2008 | 56 | 18 | ND | 38 | ND | ND | ND | | | ND | ND | | | 56 | ND | | ND | | | ND | ND | 0.32 | ND | | | | | | | | | | |
| TP209 | 2.8 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 03/12/2008 | 110 | ND | ND | ND | ND | 10 | ND | | | 50 | 50 | | | 60 | 50 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP210 | 0.7 | 03/12/2008 | 160 | ND | ND | 24 | ND | 39 | 15 | | | 47 | 38 | | | 110 | 52 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 05/12/2008 | 130 | ND | ND | 9.1 | ND | 12 | ND | | | 56 | 57 | | | 78 | 57 | | ND | | | ND | 0.062 | ND | ND | | | | | | | | | | |
| | 0.4 | 05/12/2008 | 45 | ND | ND | 3.9 | ND | 21 | ND | | | 21 | ND | | | 45 | ND | | ND | | | ND | 0.032 | ND | ND | | | | | | | | | | |
| | 0.7 | 05/12/2008 | 42 | ND | ND | ND | ND | 3.3 | ND | | | 39 | ND | | | 42 | ND | | ND | | | ND | 0.029 | ND | ND | | | | | | | | | | |
| | 2.1 | 05/12/2008 | 2800 | 260 | 64 | 780 | 490 | 530 | 490 | | | 65 | 97 | | | 1700 | 1100 | | ND | | | 8.8 | ND | 83 | 0.94 | | | | | | | | | | Excavated to rock 20/5/09 |
| TP211 | 2.8 | 05/12/2008 | 2000 | 170 | 28 | 530 | 300 | 400 | 370 | | | 56 | 79 | | | 1200 | 780 | | ND | | | 1.9 | 0.026 | 26 | 0.23 | | | | | | | | | | Excavated to rock 20/5/09 |
| | 0.1 | 09/12/2008 | 110 | 9.7 | ND | 23 | ND | 7 | ND | | | 33 | 35 | | | 73 | 35 | | ND | | | ND | ND | 0.4 | ND | | | | | | | | | | |
| TP212 | 0.7 | 09/12/2008 | 49 | 12 | ND | 28 | ND | 8.4 | ND | | | ND | ND | | | 49 | ND | | ND | | | ND | ND | 0.53 | ND | | | | | | | | | | |
| | 0.1 | 10/12/2008 | 34 | ND | ND | ND | 5.7 | ND | 7.6 | | | ND | 22 | | | ND | 34 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP213 | 2.1 | 10/12/2008 | 860 | 80 | 13 | 280 | 140 | 140 | 140 | | | 29 | 36 | | | 530 | 330 | | ND | | | 0.49 | ND | 9 | 0.14 | | | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP214 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 08/12/2008 | 21 | 3.7 | ND | 11 | ND | 6.4 | ND | | | ND | ND | | | 21 | ND | | ND | | | ND | ND | 0.12 | ND | | | | | | | | | | |
| TP215 | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.11 | ND | | | | | | | | | | |
| TP216 | 0.1 | 08/12/2008 | 24 | ND | ND | 7 | ND | 7.3 | ND | | | 10 | ND | | | 24 | ND | | ND | | | ND | ND | 0.15 | ND | | | | | | | | | | |
| | 0.1 | 08/12/2008 | 61 | ND | ND | ND | ND | ND | ND | | | 25 | 36 | | | 25 | 36 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP218 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.1 | 08/12/2008 | 160 | ND | ND | ND | 11 | ND | 29 | | | 22 | 98 | | | 22 | 130 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| TP219 | 0.7 | 08/12/2008 | 23 | ND | ND | ND | ND | ND | 4.3 | | | ND | 18 | | | ND | 23 | | ND | | | ND | ND | 0.12 | ND | | | | | | | | | | |
| | 0.1 | 03/12/2008 | 400 | 13 | ND | 45 | 21 | 45 | 33 | | | 120 | 120 | | | 220 | 180 | | ND | | | ND | ND | ND | ND | | | | | | | | | | |
| | 0.7 | 03/12/2008 | 520 | 17 | ND | 62 | 26 | 65 | 43 | | | 160 | 160 | | | 300 | 220 | | ND | | | ND | ND | 0.17 | ND | | | | | | | | | | |

ND - not detected above the method detection limit

**Table 3b - Total Petroleum Hydrocarbon (TPH) Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | TPH |
|---|---|

| RBSL (mg/kg) | | | 1717 | | | | | | | | | | | | | | | | | | | | | | | 1717 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | TOTAL_RISK_TPH | RISK_TPH_C10_C12_ALI | RISK_TPH_C10_C12_AROM | RISK_TPH_C12_C16_ALI | RISK_TPH_C12_C16_AROM | RISK_TPH_C16_C21_ALI | RISK_TPH_C16_C21_AROM | RISK_TPH_C16_C35_ALI | RISK_TPH_C21_C35_AROM | RISK_TPH_C21_C40_ALI | RISK_TPH_C21_C40_AROM | RISK_TPH_C35_C44_ALI | RISK_TPH_C35_C44_AROM | RISK_TPH_C5_C44_ALI | RISK_TPH_C5_C44_ARO | RISK_TPH_C5_C6_ALI | RISK_TPH_C5_C7_ARO | RISK_TPH_C6_C40_ALI | RISK_TPH_C6_C40_AROM | RISK_TPH_C6_C8_ALI | RISK_TPH_C7_C8_AROM | RISK_TPH_C8_C10_ALI | RISK_TPH_C8_C10_AROM | TOTAL_SPLIT_TPH | TPH_C6_C8_6SPLIT | TPH_C8_C10_6SPLIT | TPH_C10_C12_6SPLIT | TPH_C12_C16_6SPLIT | TPH_C16_C21_6SPLIT | TPH_C21_C40_6SPLIT | Comment where RBSL exceeded |
| | 1.4 | 03/12/2008 | 300 | 10 | ND | 36 | 19 | 35 | 25 | | | 90 | 89 | | | 170 | 130 | | ND | | | ND | ND | 0.48 | ND | | | | | | | | |
| TP220 | 2.1 | 03/12/2008 | 240 | 7.2 | ND | 31 | 13 | 35 | 19 | | | 72 | 64 | | | 150 | 95 | | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| | 0.1 | 03/12/2008 | 470 | ND | ND | 4.1 | ND | 30 | 9.3 | | | 160 | 260 | | | 200 | 270 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 03/12/2008 | 96 | ND | ND | 4.1 | ND | 12 | ND | | | 42 | 37 | | | 58 | 37 | | ND | | | ND | 0.012 | 0.12 | ND | | | | | | | | |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP221 | 2.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 05/12/2008 | 740 | ND | ND | ND | ND | 40 | 15 | | | 360 | 330 | | | 400 | 340 | | ND | | | ND | 0.044 | ND | ND | | | | | | | | |
| TP222 | 0.7 | 05/12/2008 | 480 | ND | ND | 3.1 | ND | 13 | 7.9 | | | 220 | 230 | | | 230 | 240 | | ND | | | ND | 0.029 | ND | ND | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.018 | ND | ND | | | | | | | | |
| TP225 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP226 | 2.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP227 | 2.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 16/01/2009 | | | | | | | | | | | | | | | | | | | | | | | | 180 | ND | 1.7 | ND | 3.9 | 9.7 | 170 | |
| TP228 | 0.7 | 16/01/2009 | | | | | | | | | | | | | | | | | | | | | | | | 67 | ND | 1.6 | ND | 2.1 | ND | 62 | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 2.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP229 | 2.8 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP230 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP231 | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.028 | 0.12 | ND | | | | | | | | |
| TP232 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | 0.13 | ND | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP233 | 2.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP234 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP235 | 2.1 | 08/12/2008 | 28 | ND | ND | ND | 2.4 | ND | | | | 25 | ND | | | 28 | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP236 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP237 | 0.1 | 08/12/2008 | 56 | ND | ND | ND | 6.6 | ND | 10 | | | ND | 38 | | | ND | 56 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 08/12/2008 | 49 | 5.1 | ND | 10 | ND | 13 | ND | | | 22 | ND | | | 49 | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP238 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP239 | 0.1 | 08/12/2008 | 22 | ND | ND | ND | ND | ND | ND | | | 22 | ND | | | 22 | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP240 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP241 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.031 | 0.12 | ND | | | | | | | | |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP242 | 1.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.016 | ND | ND | | | | | | | | |
| TP243 | 0.1 | 16/01/2009 | | | | | | | | | | | | | | | | | | | | | | | | 43 | ND | 1.6 | ND | 2.3 | ND | 40 | |
| TP244 | 0.1 | 08/12/2008 | 51 | ND | ND | ND | ND | ND | 7.8 | | | ND | 44 | | | ND | 51 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 04/12/2008 | 40 | 12 | ND | 27 | ND | ND | ND | | | ND | ND | | | 40 | ND | | ND | | | ND | ND | 0.64 | ND | | | | | | | | |
| | 1.4 | 04/12/2008 | 67 | 22 | ND | 45 | ND | ND | ND | | | ND | ND | | | 67 | ND | | ND | | | ND | ND | 0.57 | ND | | | | | | | | |
| TP245 | 2.1 | 04/12/2008 | 25 | 8 | ND | 17 | ND | ND | ND | | | ND | ND | | | 25 | ND | 0.015 | | | | ND | 0.076 | ND | ND | | | | | | | | |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 1.4 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP246 | 2.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.017 | ND | ND | | | | | | | | |
| TP247 | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.014 | ND | ND | | | | | | | | |
| TP248 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | 0.02 | ND | ND | | | | | | | | |
| TP249 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP250 | 0.1 | 09/12/2008 | 150 | ND | ND | ND | 6.2 | ND | 11 | | | 26 | 110 | | | 26 | 120 | | ND | | | ND | ND | ND | ND | | | | | | | | |
| TP251 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | | | ND | ND | | | ND | ND | | ND | | | ND | ND | ND | ND | | | | | | | | |

ND - not detected above the method detection limit

**Table 3c - Metal Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Metals |
|---|---|

| RBSL (mg/kg) | | | 64 | | 3.6 | 130 | 478 | 337 | 1 | 50 | 3 | 416 | 3280 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | TOTAL_ARSENIC | TOTAL_BORON | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | Comment where RBSL exceeded |
| CE01N | 0.5 | 05/12/2008 | 7.9 | 0.76 | ND | 12 | 25 | 19 | ND | 32 | ND | 17 | 84 | |
| CE01S | 0.5 | 05/12/2008 | 6.3 | 0.39 | ND | 13 | 39 | 16 | ND | 25 | 0.68 | 19 | 110 | |
| CE02N | 1.5 | 05/12/2008 | 18 | 0.77 | 0.69 | 16 | 62 | 40 | ND | 23 | 0.36 | 25 | 160 | |
| CE02S | 1.5 | 05/12/2008 | 9 | 0.53 | ND | 16 | 26 | 21 | ND | 25 | 0.36 | 24 | 180 | |
| CE03 | 1 | 09/12/2008 | 7 | 0.43 | ND | 16 | 35 | 19 | ND | 25 | ND | 22 | 88 | |
| CE04 | 1 | 09/12/2008 | 16 | 1.2 | 0.8 | 17 | 57 | 170 | ND | 24 | 0.31 | 20 | 290 | |
| CE05 | 1 | 09/12/2008 | 18 | 0.71 | ND | 18 | 50 | 58 | ND | 22 | 0.41 | 24 | 180 | |
| CE06B | 1 | 09/12/2008 | 8 | 0.46 | ND | 11 | 14 | 15 | ND | 27 | ND | 18 | 65 | |
| CE06N | 1 | 09/12/2008 | 9.2 | 0.41 | ND | 12 | 16 | 13 | ND | 29 | ND | 20 | 64 | |
| CE06S | 1 | 09/12/2008 | 37 | 0.72 | ND | 16 | 48 | 53 | ND | 22 | 0.43 | 25 | 160 | |
| CE07 | 3 | 09/12/2008 | 9.6 | 0.47 | ND | 15 | 24 | 22 | ND | 20 | ND | 22 | 77 | |
| CE08 | 3 | 09/12/2008 | 8.3 | 0.95 | ND | 13 | 14 | 22 | ND | 13 | 0.39 | 26 | 55 | |
| CE09 | 3 | 09/12/2008 | 9.7 | 0.34 | ND | 12 | 22 | 19 | ND | 31 | ND | 19 | 73 | |
| CE10 | 3 | 09/12/2008 | 7.1 | 0.42 | ND | 14 | 14 | 18 | ND | 18 | 0.43 | 22 | 71 | |
| MS189 | 1.5 | 10/12/2008 | 9.4 | ND | ND | 11 | 20 | 17 | ND | 24 | ND | 22 | 74 | |
| TP001 | 0.1 | 03/03/2008 | 9 | | ND | 14 | 17 | 20 | ND | 27 | 0.44 | 21 | 74 | |
| | 0.7 | 03/03/2008 | 6.4 | 0.95 | ND | 17 | 17 | 22 | ND | 41 | ND | 24 | 64 | |
| TP002 | 0.1 | 20/05/2009 | 24 | ND | 0.47 | 13 | 34 | 23 | ND | 24 | ND | 16 | 66 | |
| TP003 | 0.1 | 20/05/2009 | 24 | ND | 0.44 | 13 | 44 | 28 | ND | 25 | ND | 15 | 86 | |
| | 0.7 | 20/05/2009 | 13 | ND | 0.8 | 59 | 53 | 60 | ND | 22 | ND | 32 | 150 | |
| TP004 | 0.1 | 03/03/2008 | 8.7 | 0.55 | ND | 14 | 20 | 20 | ND | 26 | 0.46 | 23 | 68 | |
| | 0.8 | 03/03/2008 | 8.9 | 0.35 | ND | 13 | 18 | 17 | ND | 25 | 0.43 | 22 | 63 | |
| | 0.95 | 03/03/2008 | 7.1 | 0.59 | ND | 15 | 7.9 | 14 | ND | 39 | ND | 16 | 61 | |
| TP006 | 0.15 | 04/03/2008 | 13 | 0.47 | ND | 19 | 26 | 39 | ND | 35 | 0.52 | 23 | 130 | |
| | 0.6 | 04/03/2008 | 17 | 0.62 | 0.66 | 19 | 42 | 57 | ND | 34 | 0.38 | 24 | 140 | |
| TP007 | 0.15 | 04/03/2008 | 85 | 0.34 | ND | 26 | 83 | 57 | ND | 23 | 0.38 | 72 | 120 | NPT acceptance granted to leave in-situ |
| | 1 | 04/03/2008 | 21 | 0.34 | ND | 24 | 81 | 31 | ND | 30 | 0.4 | 38 | 86 | |
| TP008 | 0.15 | 04/03/2008 | 28 | 0.25 | ND | 17 | 38 | 31 | ND | 31 | 0.37 | 20 | 77 | |
| | 0.5 | 04/03/2008 | 43 | 0.54 | ND | 20 | 42 | 69 | ND | 36 | 0.45 | 24 | 130 | |
| TP009 | 0.1 | 03/03/2008 | 10 | 0.49 | ND | 14 | 21 | 22 | ND | 29 | 0.62 | 20 | 73 | |
| | 0.45 | 03/03/2008 | 9.5 | 0.28 | ND | 14 | 29 | 21 | ND | 34 | 0.47 | 22 | 73 | |
| TP010 | 0.1 | 03/03/2008 | 11 | 0.4 | ND | 18 | 26 | 22 | ND | 23 | 0.68 | 26 | 77 | |
| | 0.8 | 03/03/2008 | 6.1 | 0.28 | ND | 12 | 13 | 14 | ND | 28 | ND | 16 | 63 | |
| | 1.4 | 03/03/2008 | 5 | ND | ND | 16 | 15 | 18 | ND | 43 | ND | 20 | 65 | |
| TP11 W | 0.15 | 30/09/2009 | 59 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | |
| TP11 N | 0.15 | 30/09/2009 | 70 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | Excavated, resampled and passed 12/10/09 |
| | 0.15 | 12/10/2009 | 4.6 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | |
| TP11 S | 0.15 | 30/09/2009 | 42 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | |
| TP11 E | 0.15 | 30/09/2009 | 99 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | Excavated, resampled and passed 12/10/09 |
| | 0.15 | 12/10/2009 | 2.5 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | |
| TP11 Base | 0.45 | 30/09/2009 | 11 | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | |
| TP012 | 0.15 | 04/03/2008 | 76 | 0.54 | 2.2 | 34 | 220 | 110 | ND | 51 | 0.32 | 72 | 220 | NPT acceptance granted to leave in-situ |
| | 0.5 | 04/03/2008 | 56 | 0.41 | 1.8 | 23 | 170 | 74 | ND | 37 | 0.33 | 47 | 180 | |
| TP013 | 0.15 | 04/03/2008 | 11 | ND | ND | 18 | 41 | 23 | ND | 51 | ND | 18 | 64 | NPT acceptance granted to leave in-situ |
| TP014 | 0 | 02/04/2008 | 53 | 0.41 | ND | 17 | 58 | 52 | ND | 26 | 0.85 | 23 | 110 | |
| TP015 | 0.1 | 03/03/2008 | 8.4 | 0.5 | ND | 14 | 14 | 16 | ND | 29 | 0.39 | 21 | 70 | |
| | 0.5 | 03/03/2008 | 7.5 | 0.38 | ND | 14 | 17 | 23 | ND | 28 | 0.4 | 18 | 72 | |
| TP017 | 0.1 | 20/05/2009 | 14 | 0.26 | 0.71 | 150 | 68 | 74 | 0.49 | 29 | ND | 41 | 200 | Excavated to rock 29/6/09 |
| TP018 | 0.15 | 04/03/2008 | 36 | 0.63 | 3.5 | 41 | 130 | 2900 | | 53 | | 28 | 4400 | Subsequently excavated and resampled |
| TP018B | 0 | 08/04/2008 | 16 | 0.75 | 0.85 | 25 | 56 | 280 | ND | 49 | 0.4 | 25 | 490 | |
| TP018E | 0 | 08/04/2008 | 13 | 0.26 | ND | 23 | 45 | 87 | ND | 37 | 0.35 | 31 | 160 | |
| TP018N | 0 | 08/04/2008 | 20 | 0.72 | 2.6 | 65 | 59 | 480 | 0.26 | 41 | 0.38 | 48 | 1600 | Excavated to rock 30/9/09 |
| TP018S | 0 | 08/04/2008 | 12 | 0.3 | ND | 20 | 33 | 220 | ND | 36 | ND | 22 | 330 | |
| TP018W | 0 | 08/04/2008 | 18 | 0.75 | 2 | 26 | 93 | 1800 | | 29 | 0.39 | 20 | 2700 | Excavated to rock 30/9/09 |
| TP019 | 0.15 | 04/03/2008 | 51 | 0.43 | 1.9 | 19 | 140 | 62 | ND | 33 | 0.5 | 25 | 240 | |
| | 0.4 | 04/03/2008 | 67 | 0.54 | 2.1 | 20 | 190 | 64 | ND | 32 | 0.63 | 25 | 240 | NPT acceptance granted to leave in-situ |
| TP020 | 0.15 | 04/03/2008 | 13 | 0.46 | 0.64 | 17 | 32 | 26 | ND | 23 | 0.59 | 24 | 170 | |
| | 0.75 | 04/03/2008 | 9.9 | 0.42 | ND | 19 | 25 | 24 | ND | 37 | 0.33 | 22 | 100 | |
| TP021 | 0 | 02/04/2008 | 16 | 0.41 | ND | 18 | 47 | 28 | ND | 31 | 0.67 | 21 | 70 | |
| TP022 | 0.15 | 04/03/2008 | 9.9 | 0.52 | ND | 16 | 43 | 16 | ND | 29 | 0.54 | 18 | 61 | |
| | 0.5 | 04/03/2008 | 17 | 0.32 | ND | 15 | 42 | 19 | ND | 39 | 0.52 | 16 | 59 | |
| TP023 | 0.1 | 03/03/2008 | 9.1 | 0.65 | ND | 18 | 22 | 20 | ND | 29 | 0.8 | 25 | 150 | |
| | 0.75 | 03/03/2008 | 10 | 0.61 | ND | 15 | 24 | 20 | ND | 25 | 0.69 | 23 | 110 | |
| TP024 | 0.1 | 20/05/2009 | 15 | 0.34 | 0.44 | 14 | 30 | 160 | 0.78 | 23 | 0.47 | 14 | 72 | |
| TP025 | 0.15 | 05/03/2008 | 6.7 | 0.3 | ND | 16 | 22 | 48 | ND | 36 | ND | 17 | 110 | |
| TP026 | 0.15 | 05/03/2008 | 110 | 0.67 | 3.7 | 18 | 350 | 98 | | 35 | 0.75 | 27 | 290 | Excavated, resampled and passed 07/4/08 |
| | 0.5 | 05/03/2008 | 46 | 0.69 | 0.8 | 16 | 95 | 30 | ND | 31 | 0.74 | 21 | 140 | |
| TP026B | 0 | 07/04/2008 | 26 | 0.73 | 0.75 | 18 | 220 | 51 | ND | 33 | 1.4 | 23 | 130 | |
| TP026E | 0 | 07/04/2008 | 48 | 0.5 | 1.1 | 19 | 100 | 68 | ND | 33 | 0.73 | 29 | 190 | |
| TP026N | 0 | 07/04/2008 | 49 | 0.98 | 0.69 | 19 | 100 | 41 | ND | 29 | 1 | 27 | 150 | |
| TP026S | 0 | 07/04/2008 | 44 | 0.64 | 0.51 | 21 | 76 | 81 | ND | 34 | 0.73 | 27 | 140 | |
| TP026W | 0 | 07/04/2008 | 44 | 0.9 | ND | 19 | 120 | 57 | ND | 33 | 0.72 | 24 | 130 | |
| TP027 | 0.15 | 04/03/2008 | 38 | 1.7 | ND | 15 | 33 | 29 | ND | 17 | 1.1 | 26 | 65 | |
| | 0.8 | 04/03/2008 | 13 | 1.6 | ND | 12 | 22 | 18 | ND | 14 | 0.58 | 22 | 45 | |
| TP028 | 0.1 | 03/03/2008 | 9.1 | 0.59 | ND | 17 | 18 | 18 | ND | 24 | 0.79 | 22 | 65 | |
| | 0.9 | 03/03/2008 | 8.8 | 0.45 | ND | 12 | 15 | 15 | ND | 25 | 0.32 | 17 | 64 | |
| TP029 | 0.1 | 20/05/2009 | 10 | ND | 0.39 | 11 | 19 | 21 | ND | 22 | ND | 15 | 89 | |
| TP030 | 0.15 | 05/03/2008 | 18 | 0.43 | 0.68 | 43 | 57 | 100 | ND | 33 | 0.35 | 23 | 190 | |
| TP031 | 0.2 | 05/03/2008 | 29 | 0.47 | 0.67 | 16 | 92 | 70 | ND | 30 | 0.43 | 22 | 150 | |
| | 0.9 | 05/03/2008 | 17 | 0.3 | 0.64 | 26 | 56 | 58 | ND | 38 | 0.35 | 22 | 190 | |
| TP032 | 0.15 | 04/03/2008 | 37 | 0.61 | ND | 19 | 36 | 29 | ND | 38 | 0.52 | 23 | 60 | |
| TP033 | 0.14 | 04/03/2008 | 16 | 2.3 | ND | 17 | 46 | 19 | ND | 22 | 0.34 | 23 | 54 | |
| | 0.15 | 04/03/2008 | 23 | 1 | ND | 17 | 66 | 20 | ND | 11 | 0.68 | 29 | 39 | |
| TP034 | 0.1 | 03/03/2008 | 7.9 | 0.36 | ND | 14 | 18 | 17 | ND | 26 | 0.32 | 20 | 62 | |
| | 1 | 03/03/2008 | 7 | 0.31 | ND | 13 | 14 | 16 | ND | 31 | ND | 18 | 63 | |
| TP035 | 0.1 | 03/03/2008 | 15 | 0.73 | ND | 18 | 48 | 89 | ND | 28 | 0.55 | 29 | 170 | |
| | 0.9 | 03/03/2008 | 6.8 | 0.38 | ND | 16 | 15 | 24 | ND | 32 | 0.31 | 23 | 80 | |
| TP036 | 0.1 | 10/12/2008 | 11 | 0.33 | ND | 17 | 37 | 32 | ND | 36 | ND | 21 | 100 | |
| TP037 | 0.15 | 04/03/2008 | 13 | 0.99 | 1.2 | 21 | 64 | 780 | | 37 | | 19 | 1100 | Excavated and resampled but failed again |
| TP037B | 0 | 07/04/2008 | 12 | 0.67 | 0.6 | 25 | 34 | 360 | ND | 51 | ND | 21 | 630 | Excavated, resampled, passed 20/5/08 |
| TP037E | 0 | 07/04/2008 | 11 | 1 | ND | 20 | 33 | 270 | ND | 47 | ND | 21 | 450 | Excavated, resampled, passed 20/5/08 |
| TP037S | 0 | 07/04/2008 | 8.8 | 0.71 | | 19 | 24 | 140 | | 49 | | 19 | 250 | Excavated, resampled, passed 20/5/08 |
| TP037W | 0 | 07/04/2008 | 20 | 1.3 | 1.7 | 35 | 120 | 1300 | | 57 | 0.33 | 27 | 2000 | Excavated, resampled, passed 20/5/08 |
| TP037N | 0 | 07/04/2008 | 27 | 1.1 | 2.5 | 32 | 120 | 2500 | 0.25 | 51 | 0.36 | 29 | 3600 | Excavated, resampled and passed 20/5/08 |
| | 0 | 20/05/2008 | 18 | 1.3 | 0.92 | 22 | 86 | 130 | 0.5 | 40 | 0.77 | 27 | 240 | |

ND - not detected above the method detection limit

**Table 3c - Metal Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Metals |
|---|---|

| RBSL (mg/kg) | | | 64 | | 3.6 | 130 | 478 | 337 | 1 | 50 | 3 | 416 | 3280 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | TOTAL_ARSENIC | TOTAL_BORON | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | Comment where RBSL exceeded |
| TP038 | 0.15 | 04/03/2008 | 12 | 0.56 | ND | 17 | 28 | 25 | ND | 24 | 0.44 | 25 | 110 | |
| | 0.9 | 04/03/2008 | 8.4 | 0.63 | ND | 16 | 17 | 18 | ND | 27 | ND | 22 | 99 | |
| TP039 | 0.15 | 04/03/2008 | 11 | 0.4 | ND | 15 | 24 | 24 | ND | 29 | 0.32 | 21 | 78 | |
| | 0.85 | 04/03/2008 | 16 | 0.38 | ND | 13 | 33 | 26 | ND | 22 | ND | 21 | 73 | |
| TP040 | 0.05 | 03/03/2008 | 12 | 0.62 | ND | 16 | 21 | 19 | ND | 26 | 0.67 | 23 | 73 | |
| TP041 | 0.1 | 03/03/2008 | 12 | 0.84 | ND | 19 | 21 | 25 | ND | 19 | 0.77 | 32 | 70 | |
| | 0.8 | 03/03/2008 | 9.6 | 0.34 | ND | 15 | 21 | 20 | ND | 29 | 0.36 | 22 | 69 | |
| TP042 | 0.15 | 05/03/2008 | 8.4 | 0.26 | 0.69 | 14 | 26 | 69 | ND | 24 | 0.33 | 16 | 150 | |
| | 0.55 | 05/03/2008 | 7.8 | 0.41 | ND | 11 | 18 | 21 | ND | 25 | ND | 15 | 74 | |
| TP042 | 0.1 | 01/12/2008 | 8.3 | 2.3 | ND | 15 | 17 | 15 | ND | 31 | ND | 21 | 88 | |
| TP043 | 0.15 | 04/03/2008 | 7.6 | 0.3 | ND | 14 | 58 | 16 | ND | 26 | ND | 15 | 63 | |
| | 0.95 | 04/03/2008 | 8.7 | 0.26 | ND | 14 | 42 | 23 | ND | 30 | ND | 17 | 75 | |
| TP044 | 0.15 | 05/03/2008 | 8.3 | 0.36 | ND | 17 | 17 | 16 | ND | 24 | ND | 22 | 57 | |
| | 0.8 | 05/03/2008 | 8.1 | 0.32 | ND | 13 | 19 | 17 | ND | 23 | ND | 18 | 57 | |
| TP045 | 0.15 | 04/03/2008 | 8.6 | 0.4 | ND | 13 | 18 | 16 | ND | 21 | 0.45 | 16 | 57 | |
| | 0.6 | 04/03/2008 | 15 | 0.44 | ND | 12 | 17 | 17 | ND | 22 | 0.37 | 15 | 56 | |
| TP046 | 0 | 02/04/2008 | 11 | 0.86 | ND | 17 | 19 | 23 | ND | 26 | 0.76 | 24 | 73 | |
| TP047 | 0.1 | 16/01/2009 | 11 | 0.58 | ND | 12 | 34 | 80 | 0.43 | 21 | ND | 15 | 280 | |
| TP048 | 0.1 | 01/12/2008 | 53 | 0.43 | 2.3 | 19 | 130 | 2500 | | 34 | 1 | 21 | 3600 | Excavated ,resampled and passed 20/5/09. |
| | 0.1 | 20/05/2009 | 5.8 | 4 | ND | 15 | 18 | 91 | ND | 18 | ND | 11 | 210 | |
| TP049 | 0.15 | 05/03/2008 | 23 | 0.54 | 0.88 | 16 | 83 | 30 | ND | 24 | 0.59 | 23 | 110 | |
| | 1.3 | 05/03/2008 | 9.9 | 0.46 | ND | 14 | 31 | 19 | ND | 28 | 0.32 | 18 | 83 | |
| | 1.7 | 05/03/2008 | 7.8 | ND | ND | 11 | 18 | 19 | ND | 31 | ND | 18 | 77 | |
| TP050 | 0.15 | 04/03/2008 | 17 | 0.6 | ND | 14 | 42 | 32 | ND | 21 | 0.42 | 25 | 75 | |
| | 0.9 | 04/03/2008 | 8.2 | 0.53 | ND | 12 | 22 | 24 | ND | 26 | ND | 19 | 70 | |
| TP051 | 0.1 | 03/03/2008 | 20 | 0.89 | ND | 16 | 61 | 30 | ND | 21 | 0.7 | 25 | 90 | |
| TP052 | 0.1 | 03/03/2008 | 14 | 0.57 | 0.57 | 14 | 41 | 19 | ND | 22 | 0.66 | 21 | 100 | |
| | 1.4 | 03/03/2008 | 7 | 0.39 | ND | 12 | 20 | 17 | ND | 24 | 0.3 | 18 | 68 | |
| TP053 | 0.1 | 03/12/2008 | 13 | 0.98 | 0.87 | 17 | 51 | 320 | ND | 24 | ND | 17 | 520 | |
| TP054 | 0.1 | 01/12/2008 | 15 | 0.68 | 0.65 | 21 | 56 | 150 | 0.27 | 30 | ND | 22 | 240 | |
| TP055 | 0.15 | 04/03/2008 | 9.3 | 0.52 | 0.55 | 16 | 25 | 19 | ND | 18 | 0.34 | 23 | 96 | |
| | 2 | 04/03/2008 | 8.5 | 0.3 | ND | 12 | 19 | 16 | ND | 34 | ND | 15 | 74 | |
| TP056 | 0.15 | 04/03/2008 | 15 | 0.7 | 0.77 | 22 | 44 | 110 | ND | 24 | 0.41 | 26 | 140 | |
| | 1 | 04/03/2008 | 10 | 0.57 | ND | 14 | 16 | 18 | ND | 26 | ND | 21 | 56 | |
| TP057 | 0 | 03/03/2008 | 3.7 | 0.49 | ND | 17 | 7.9 | 18 | ND | 42 | ND | 20 | 69 | |
| TP058 | 0.15 | 03/03/2008 | 20 | 0.57 | 0.61 | 14 | 45 | 29 | ND | 17 | 0.88 | 23 | 100 | |
| | 1 | 03/03/2008 | 12 | 0.43 | ND | 14 | 49 | 25 | ND | 23 | 0.39 | 19 | 92 | |
| TP059 | 0.1 | 03/03/2008 | 46 | 0.59 | 1.3 | 25 | 92 | 220 | 0.33 | 44 | 0.94 | 29 | 370 | |
| TP060 | 0.1 | 01/12/2008 | 9.9 | 0.61 | 0.63 | 16 | 33 | 79 | 0.52 | 40 | ND | 21 | 190 | |
| TP061 | 0.1 | 01/12/2008 | 11 | 0.9 | ND | 17 | 35 | 220 | ND | 34 | ND | 19 | 200 | |
| TP062 | 0.1 | 01/12/2008 | 14 | 0.69 | ND | 16 | 32 | 21 | ND | 19 | 0.33 | 24 | 64 | |
| | 0.7 | 01/12/2008 | 8.3 | 0.44 | ND | 13 | 31 | 19 | ND | 26 | ND | 18 | 75 | |
| TP063 | 0.2 | 05/03/2008 | 16 | 0.39 | ND | 11 | 20 | 17 | ND | 15 | ND | 16 | 38 | |
| | 0.85 | 05/03/2008 | 8.5 | 0.43 | ND | 12 | 27 | 18 | ND | 21 | ND | 17 | 58 | |
| TP064 | 0 | 05/03/2008 | 3.5 | 0.3 | ND | 15 | 7.6 | 18 | ND | 50 | ND | 18 | 81 | |
| TP065 | 0.15 | 03/03/2008 | 7.4 | 0.33 | ND | 17 | 8.8 | 25 | ND | 68 | ND | 20 | 87 | NPT acceptance granted to leave in-situ |
| | 0.65 | 03/03/2008 | 5.9 | 0.29 | ND | 17 | 180 | 25 | ND | 53 | ND | 19 | 74 | NPT acceptance granted to leave in-situ |
| TP068 | 0.1 | 01/12/2008 | 12 | 0.47 | ND | 32 | 54 | 140 | ND | 48 | ND | 25 | 310 | |
| | 0.5 | 01/12/2008 | 8 | 0.39 | ND | 20 | 37 | 40 | ND | 51 | ND | 19 | 140 | NPT acceptance granted to leave in-situ |
| TP069 | 0.1 | 01/12/2008 | 9.9 | 0.47 | ND | 19 | 32 | 80 | ND | 45 | ND | 24 | 130 | |
| TP070 | 0.1 | 01/12/2008 | 9.9 | 0.36 | ND | 15 | 34 | 65 | 0.43 | 22 | 0.31 | 17 | 130 | |
| TP071 | 0.15 | 05/03/2008 | 12 | 0.52 | 0.68 | 18 | 65 | 37 | ND | 18 | 0.47 | 24 | 79 | |
| | 1.2 | 05/03/2008 | 8.3 | 0.38 | ND | 15 | 23 | 23 | ND | 28 | 0.32 | 20 | 78 | |
| TP072 | 0.15 | 05/03/2008 | 8.4 | 0.26 | 0.69 | 14 | 26 | 69 | ND | 24 | 0.33 | 16 | 150 | |
| | 0.55 | 05/03/2008 | 7.8 | 0.41 | ND | 11 | 18 | 21 | ND | 25 | ND | 15 | 74 | |
| TP073 | 0 | 06/03/2008 | 5.3 | 0.32 | ND | 16 | 8.7 | 22 | ND | 40 | ND | 15 | 120 | |
| TP074 | 0.1 | 03/03/2008 | 12 | 0.71 | ND | 16 | 29 | 22 | ND | 21 | 1.2 | 24 | 110 | |
| | 0.95 | 03/03/2008 | 8.1 | 0.43 | ND | 15 | 21 | 24 | ND | 27 | 0.51 | 18 | 70 | |
| TP077 | 0.1 | 01/12/2008 | 49 | 0.84 | 0.74 | 14 | 130 | 54 | ND | 19 | 0.53 | 24 | 140 | |
| TP078 | 0.1 | 01/12/2008 | 8.8 | 0.33 | ND | 13 | 22 | 20 | ND | 27 | 0.4 | 20 | 89 | |
| | 0.7 | 01/12/2008 | 15 | 0.41 | 0.52 | 29 | 62 | 210 | 0.46 | 36 | 0.4 | 24 | 260 | |
| TP079 | 0.1 | 01/12/2008 | 8.5 | 0.57 | ND | 20 | 35 | 120 | 0.31 | 54 | ND | 20 | 180 | NPT acceptance granted to leave in-situ |
| TP080 | 0.1 | 01/12/2008 | 68 | 0.59 | 1.2 | 25 | 550 | 140 | 0.29 | 26 | 0.41 | 33 | 370 | NPT acceptance granted to leave in-situ |
| | 0.7 | 01/12/2008 | 7 | 0.41 | ND | 16 | 18 | 18 | ND | 25 | ND | 22 | 62 | |
| | 1.2 | 01/12/2008 | 6.9 | 0.78 | ND | 11 | 16 | 48 | ND | 25 | ND | 17 | 61 | |
| TP081 | 0.15 | 04/03/2008 | 9.6 | 0.3 | ND | 14 | 22 | 25 | ND | 22 | 0.3 | 21 | 56 | |
| | 1.1 | 04/03/2008 | 8.9 | 0.5 | ND | 12 | 22 | 26 | ND | 26 | ND | 19 | 79 | |
| TP082 | 0 | 05/03/2008 | 5.1 | 0.27 | ND | 16 | 11 | 25 | ND | 51 | ND | 19 | 93 | NPT acceptance granted to leave in-situ |
| TP083 | 0.15 | 03/03/2008 | 49 | 0.68 | 1.5 | 23 | 160 | 540 | ND | 25 | 0.56 | 32 | 650 | NPT acceptance granted to leave in-situ |
| | 0.5 | 03/03/2008 | 14 | 0.49 | ND | 14 | 43 | 63 | ND | 19 | 0.6 | 22 | 120 | |
| TP084 | 0.15 | 03/03/2008 | 34 | 0.45 | 1.1 | 19 | 81 | 250 | 0.63 | 35 | 0.41 | 27 | 570 | |
| TP087 | 0.1 | 01/12/2008 | 14 | 0.58 | ND | 19 | 38 | 41 | ND | 32 | 0.49 | 25 | 150 | |
| TP088 | 0.1 | 01/12/2008 | 34 | 0.53 | 0.81 | 17 | 100 | 110 | 0.25 | 30 | 0.52 | 28 | 200 | |
| TP089 | 0.1 | 02/12/2008 | 12 | 0.67 | ND | 21 | 46 | 180 | ND | 38 | ND | 20 | 210 | |
| TP090 | 0.1 | 01/12/2008 | 8.4 | ND | ND | 13 | 17 | 16 | ND | 37 | ND | 20 | 83 | |
| | 0.7 | 01/12/2008 | 9.2 | 0.47 | ND | 12 | 18 | 21 | ND | 31 | ND | 19 | 77 | |
| | 1.2 | 01/12/2008 | 11 | 0.72 | ND | 12 | 36 | 38 | ND | 25 | ND | 18 | 100 | |
| TP091 | 0.2 | 05/03/2008 | 8.3 | 0.31 | ND | 12 | 23 | 19 | ND | 25 | ND | 16 | 82 | |
| TP092 | 0 | 05/03/2008 | 4.7 | 0.31 | 0.83 | 14 | 10 | 20 | ND | 45 | ND | 17 | 120 | |
| TP093 | 0 | 06/03/2008 | 7.3 | 0.26 | ND | 18 | 13 | 22 | ND | 42 | ND | 19 | 71 | |
| TP094 | 0.15 | 03/03/2008 | 9.9 | 0.51 | 0.9 | 11 | 35 | 18 | ND | 25 | ND | 19 | 110 | |
| | 0.6 | 03/03/2008 | 8.6 | 0.43 | 0.51 | 14 | 25 | 20 | ND | 37 | ND | 17 | 130 | |
| TP098 | 0.1 | 02/12/2008 | 38 | 0.44 | 1.2 | 17 | 110 | 140 | ND | 27 | 0.66 | 25 | 570 | |
| TP099 | 0.1 | 09/12/2008 | 33 | 0.6 | 0.54 | 17 | 42 | 170 | 0.33 | 33 | ND | 20 | 250 | |
| TP100 | 0.1 | 01/12/2008 | 12 | ND | ND | 17 | 51 | 75 | ND | 31 | 0.37 | 22 | 190 | |
| | 0.7 | 01/12/2008 | 10 | 0.4 | ND | 11 | 22 | 22 | ND | 29 | ND | 17 | 80 | |
| TP101 | 0.1 | 10/12/2008 | 7.9 | 0.3 | ND | 12 | 18 | 15 | ND | 27 | ND | 18 | 68 | |
| TP102 | 0.15 | 05/03/2008 | 7.7 | 0.51 | ND | 12 | 22 | 34 | ND | 34 | ND | 19 | 110 | |
| | 0.7 | 05/03/2008 | 4.8 | 0.27 | ND | 14 | 7 | 15 | ND | 44 | ND | 15 | 70 | |
| TP103 | 0 | 06/03/2008 | 10 | 0.29 | ND | 18 | 12 | 25 | ND | 46 | ND | 18 | 77 | |
| TP104 | 0.15 | 03/03/2008 | 20 | 1.2 | 1.3 | 17 | 78 | 98 | ND | 23 | 0.48 | 25 | 350 | |
| | 0.8 | 03/03/2008 | 8 | 0.49 | ND | 18 | 18 | 21 | ND | 34 | 0.46 | 24 | 100 | |
| TP107 | 0.1 | 01/12/2008 | 45 | 0.77 | 1.4 | 32 | 720 | 410 | 0.6 | 39 | 0.42 | 28 | 830 | NPT acceptance granted to leave in-situ |
| TP108 | 0.1 | 02/12/2008 | 14 | 0.67 | ND | 13 | 43 | 65 | ND | 24 | 0.34 | 17 | 280 | |
| TP109 | 0.1 | 03/12/2008 | 14 | 0.59 | ND | 19 | 55 | 130 | 0.32 | 39 | ND | 20 | 240 | |

ND - not detected above the method detection limit

**Table 3c - Metal Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Metals |
|---|---|

| RBSL (mg/kg) | | | 64 | | 3.6 | 130 | 478 | 337 | 1 | 50 | 3 | 416 | 3280 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | TOTAL_ARSENIC | TOTAL_BORON | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | Comment where RBSL exceeded |
| TP110 | 0.1 | 02/12/2008 | 8.6 | 1.4 | ND | 20 | 28 | 52 | ND | 31 | ND | 19 | 130 | |
| | 0.7 | 02/12/2008 | 7.4 | 0.5 | ND | 15 | 16 | 19 | ND | 30 | ND | 22 | 68 | |
| | 1.4 | 02/12/2008 | 7.4 | 0.43 | ND | 13 | 14 | 16 | ND | 29 | 0.32 | 18 | 65 | |
| TP111 | 0.1 | 10/12/2008 | 22 | 0.47 | ND | 14 | 45 | 47 | ND | 21 | 0.36 | 22 | 130 | |
| | 0.7 | 10/12/2008 | 11 | 0.78 | ND | 14 | 26 | 26 | ND | 15 | 0.33 | 23 | 67 | |
| | 1.4 | 10/12/2008 | 9.6 | 0.4 | ND | 12 | 16 | 13 | ND | 27 | ND | 19 | 65 | |
| TP112 | 0.15 | 05/03/2008 | 7.9 | 0.28 | 0.53 | 14 | 18 | 28 | ND | 28 | ND | 18 | 89 | |
| | 0.65 | 05/03/2008 | 6.4 | 0.37 | ND | 14 | 15 | 18 | ND | 30 | ND | 16 | 71 | |
| TP113 | 0 | 05/03/2008 | 4.5 | 0.27 | ND | 14 | 11 | 21 | ND | 39 | ND | 12 | 98 | |
| TP114 | 0 | 06/03/2008 | 3.3 | 0.28 | ND | 16 | 8.1 | 11 | ND | 33 | ND | 15 | 64 | |
| TP119 | 0.1 | 01/12/2008 | 16 | 1.1 | ND | 16 | 44 | 46 | ND | 64 | ND | 19 | 130 | NPT acceptance granted to leave in-situ |
| TP120 | 0.1 | 02/12/2008 | 16 | 0.72 | 34 | 25 | 53 | 73 | ND | 32 | ND | 24 | 170 | Excavated, resampled and passed 20/5/09. |
| | 0.1 | 20/05/2009 | 14 | 0.68 | ND | 16 | 43 | 62 | ND | 30 | ND | 16 | 180 | |
| TP121 | 0.1 | 02/12/2008 | 16 | 0.37 | ND | 22 | 45 | 170 | 0.36 | 49 | 0.52 | 22 | 300 | |
| TP122 | 0.1 | 10/12/2008 | 18 | 0.52 | ND | 14 | 46 | 37 | ND | 21 | 0.38 | 22 | 110 | |
| TP123 | 0.15 | 05/03/2008 | 7 | ND | 1.5 | 12 | 13 | 13 | ND | 30 | 0.41 | 15 | 69 | |
| | 0.95 | 05/03/2008 | 3.9 | ND | 0.58 | 7 | 7.1 | ND | ND | 16 | ND | 9.8 | 35 | |
| TP124 | 0 | 05/03/2008 | 11 | 0.43 | ND | 20 | 36 | 25 | ND | 55 | ND | 24 | 100 | NPT acceptance granted to leave in-situ |
| TP125 | 0 | 06/03/2008 | 3.8 | 0.28 | ND | 15 | 7.9 | 14 | ND | 35 | ND | 15 | 66 | |
| TP126 | 0.2 | 06/03/2008 | 46 | 0.38 | ND | 14 | 23 | 16 | ND | 23 | 0.7 | 20 | 65 | |
| | 0.85 | 06/03/2008 | 29 | 0.47 | ND | 13 | 49 | 34 | ND | 22 | 0.57 | 19 | 130 | |
| TP130 | 0.1 | 01/12/2008 | 35 | 0.82 | 0.99 | 27 | 260 | 400 | 0.71 | 43 | 0.43 | 30 | 720 | NPT acceptance granted to leave in-situ |
| TP131 | 0.1 | 02/12/2008 | 12 | 0.54 | ND | 22 | 82 | 120 | ND | 36 | ND | 22 | 200 | |
| TP132 | 0.1 | 02/12/2008 | 5.7 | 0.41 | ND | 15 | 31 | 15 | ND | 29 | 0.74 | 21 | 83 | |
| | 0.7 | 01/12/2008 | 22 | 0.35 | 0.62 | 17 | 81 | 120 | 0.4 | 32 | 0.4 | 25 | 160 | |
| TP133 | | 02/12/2008 | 19 | 0.48 | 0.97 | 43 | 360 | 630 | 1.3 | 37 | 0.37 | 34 | 1400 | Excavated, resampled and passed 20/5/09. |
| | 0.1 | 20/05/2009 | 23 | 0.77 | 0.47 | 38 | 77 | 230 | 0.38 | 23 | ND | 22 | 700 | |
| | 0.7 | 02/12/2008 | 8.7 | 1.6 | ND | 16 | 17 | 19 | ND | 22 | ND | 21 | 58 | |
| | 1.5 | 02/12/2008 | 9.4 | 0.54 | ND | 12 | 20 | 28 | ND | 25 | ND | 20 | 81 | |
| TP134 | 0.1 | 09/12/2008 | 12 | 0.82 | ND | 13 | 26 | 19 | ND | 16 | 0.64 | 22 | 160 | |
| | 0.7 | 09/12/2008 | 21 | 1.2 | ND | 15 | 62 | 45 | ND | 18 | 0.69 | 26 | 150 | |
| | 1.4 | 09/12/2008 | 10 | 0.45 | ND | 11 | 24 | 19 | ND | 30 | ND | 17 | 88 | |
| TP135 | 0 | 05/03/2008 | 17 | 0.27 | ND | 15 | 25 | 36 | ND | 49 | ND | 22 | 100 | |
| TP136 | 0.2 | 06/03/2008 | 3.2 | 0.27 | ND | 10 | 8.4 | 20 | ND | 25 | ND | 11 | 79 | |
| TP137 | 0.15 | 06/03/2008 | 9.5 | 0.59 | ND | 13 | 61 | 17 | ND | 28 | 0.39 | 18 | 72 | |
| | 0.85 | 06/03/2008 | 12 | 0.46 | ND | 15 | 53 | 26 | ND | 32 | 0.33 | 17 | 93 | |
| TP141 | 0.1 | 02/12/2008 | 12 | 0.39 | ND | 18 | 33 | 51 | ND | 51 | ND | 19 | 130 | NPT acceptance granted to leave in-situ |
| TP142 | 0.1 | 01/12/2008 | 11 | 0.49 | ND | 20 | 51 | 98 | 0.33 | 44 | ND | 24 | 220 | |
| TP143 | 0.1 | 10/12/2008 | 9.4 | 0.53 | ND | 19 | 43 | 63 | ND | 46 | 0.32 | 27 | 160 | |
| | 0.7 | 10/12/2008 | 11 | 0.62 | ND | 13 | 22 | 21 | ND | 15 | 0.31 | 21 | 130 | |
| | 1.4 | 10/12/2008 | 9.1 | 0.34 | ND | 14 | 23 | 25 | ND | 20 | ND | 21 | 89 | |
| TP144 | 0.1 | 09/12/2008 | 43 | 0.5 | 0.87 | 23 | 140 | 200 | 0.69 | 34 | 0.42 | 49 | 780 | |
| | 0.7 | 09/12/2008 | 9.8 | 0.58 | ND | 15 | 21 | 20 | ND | 15 | 0.36 | 22 | 71 | |
| | 1.4 | 09/12/2008 | 11 | 0.37 | ND | 11 | 23 | 18 | ND | 22 | ND | 17 | 71 | |
| | 2.1 | 09/12/2008 | 8.8 | 0.47 | ND | 10 | 21 | 18 | 0.25 | 28 | ND | 16 | 75 | |
| TP145 | 0.15 | 05/03/2008 | 5.1 | 0.26 | ND | 15 | 7.8 | 16 | ND | 36 | ND | 15 | 71 | |
| | 0.85 | 05/03/2008 | 5.4 | 0.31 | ND | 15 | 11 | 20 | ND | 37 | ND | 16 | 83 | |
| TP146 | 0 | 05/03/2008 | 4.4 | 0.3 | ND | 13 | 13 | 17 | ND | 27 | ND | 13 | 86 | |
| TP147 | 0 | 06/03/2008 | 5.9 | 0.36 | ND | 12 | 20 | 22 | ND | 33 | ND | 12 | 100 | |
| TP151 | 0.1 | 01/12/2008 | 13 | 1.3 | ND | 17 | 46 | 35 | ND | 68 | 0.55 | 19 | 120 | NPT acceptance granted to leave in-situ |
| TP152 | 0.1 | 03/12/2008 | 7.8 | 0.33 | ND | 18 | 22 | 31 | ND | 40 | ND | 20 | 96 | |
| | 0.7 | 03/12/2008 | 10 | 0.33 | ND | 19 | 37 | 49 | ND | 53 | ND | 23 | 890 | NPT acceptance granted to leave in-situ |
| TP153 | 0.1 | 10/12/2008 | 15 | 0.33 | ND | 17 | 47 | 49 | ND | 33 | 0.4 | 22 | 120 | |
| | 0.7 | 10/12/2008 | 16 | 0.39 | 0.59 | 17 | 62 | 79 | ND | 35 | 0.37 | 22 | 180 | |
| | 1.4 | 10/12/2008 | 9.7 | 0.36 | ND | 9.8 | 20 | 17 | ND | 21 | ND | 16 | 66 | |
| TP154 | | 09/12/2008 | 24 | 0.72 | | 17 | 77 | 180 | 13 | 40 | | 20 | 530 | Excavated and resampled but still marginal failure |
| | 0.1 | 20/05/2009 | 29 | 0.45 | 0.49 | 19 | 82 | 190 | 1.3 | 31 | ND | 17 | 580 | NPT acceptance granted to leave in-situ |
| TP155 | 0.1 | 09/12/2008 | 8.5 | 0.25 | ND | 12 | 21 | 14 | ND | 24 | ND | 18 | 83 | |
| | 0.7 | 09/12/2008 | 8.7 | ND | ND | 11 | 21 | 16 | ND | 29 | ND | 18 | 76 | |
| TP156 | 0 | 05/03/2008 | 3.6 | ND | ND | 13 | 7.9 | 35 | ND | 28 | ND | 12 | 67 | |
| TP157 | 0.2 | 06/03/2008 | 6.1 | 0.42 | ND | 14 | 13 | 19 | ND | 35 | ND | 16 | 160 | |
| TP158 | 0 | 06/03/2008 | 14 | 0.44 | ND | 16 | 43 | 48 | ND | 35 | ND | 17 | 170 | |
| TP162 | 0.1 | 01/12/2008 | 10 | 0.47 | ND | 16 | 33 | 24 | 0.35 | 55 | ND | 19 | 120 | NPTCBC acceptance to be left in-situ |
| TP163 | 0.1 | 05/12/2008 | 11 | 0.43 | ND | 16 | 36 | 53 | ND | 31 | 0.4 | 22 | 130 | |
| | 0.7 | 05/12/2008 | 9.1 | 0.33 | ND | 17 | 41 | 44 | ND | 38 | ND | 18 | 120 | |
| | 1.4 | 05/12/2008 | 7.2 | 0.5 | ND | 15 | 32 | 25 | ND | 28 | ND | 18 | 150 | |
| TP164 | 0.1 | 10/12/2008 | 17 | 0.92 | ND | 14 | 43 | 33 | ND | 12 | 0.34 | 23 | 86 | |
| | 0.7 | 10/12/2008 | 12 | 0.54 | ND | 16 | 26 | 22 | ND | 17 | 0.35 | 24 | 75 | |
| | 1.4 | 10/12/2008 | 9.7 | 0.31 | ND | 12 | 20 | 19 | ND | 22 | ND | 23 | 71 | |
| TP165 | 0.1 | 04/12/2008 | 18 | 0.38 | ND | 15 | 61 | 38 | ND | 48 | ND | 19 | 150 | |
| | 0.7 | 09/12/2008 | 10 | 0.31 | ND | 13 | 30 | 92 | 0.26 | 24 | ND | 21 | 180 | |
| TP166 | 0.15 | 06/03/2008 | 12 | 0.33 | ND | 12 | 28 | 22 | ND | 17 | 0.5 | 18 | 85 | |
| TP167 | 0 | 06/03/2008 | 5.7 | 0.35 | ND | 13 | 13 | 22 | ND | 28 | ND | 13 | 79 | |
| TP168 | 0.7 | 06/03/2008 | 8.4 | 0.92 | ND | 17 | 27 | 24 | ND | 33 | 0.36 | 19 | 91 | |
| TP171 | 0.2 | 10/04/2008 | 38 | ND | 1.6 | 13 | 52 | 520 | ND | 29 | ND | 12 | 990 | Excavated , resampled and passed 16/1/09 |
| TP171 | 0.1 | 16/01/2009 | 9.9 | 1.2 | ND | 44 | 47 | 41 | ND | 27 | 0.33 | 40 | 150 | |
| TP172 | 0.1 | 04/12/2008 | 40 | 1.1 | 1.1 | 44 | 640 | 250 | 0.3 | 58 | 0.63 | 110 | 790 | Excavated , resampled and passed 16/1/09 |
| | 0.1 | 16/01/2009 | 3.7 | 0.52 | ND | 21 | 36 | 34 | ND | 50 | ND | 24 | 130 | |
| | 0.7 | 04/12/2008 | 20 | 1.1 | 0.59 | 23 | 260 | 190 | ND | 40 | 0.33 | 26 | 1100 | |
| TP173 | 0.1 | 03/12/2008 | 2.8 | 0.54 | ND | 20 | 32 | 27 | ND | 44 | ND | 30 | 110 | |
| | 0.7 | 03/12/2008 | 2.8 | 0.52 | ND | 19 | 30 | 23 | ND | 39 | ND | 20 | 96 | |
| | 1.4 | 03/12/2008 | 6.3 | 0.37 | ND | 18 | 31 | 23 | ND | 49 | ND | 19 | 94 | |
| TP174 | 0.1 | 02/12/2008 | 6.3 | 0.37 | ND | 14 | 19 | 14 | ND | 29 | 0.36 | 18 | 69 | |
| TP175 | 0.1 | 10/12/2008 | 15 | 0.33 | ND | 17 | 45 | 92 | ND | 21 | 0.45 | 24 | 170 | |
| | 0.7 | 10/12/2008 | 8.8 | 0.27 | ND | 11 | 17 | 16 | ND | 22 | ND | 20 | 67 | |
| TP176 | 0.1 | 10/12/2008 | 16 | 0.48 | ND | 15 | 35 | 28 | ND | 22 | 0.43 | 22 | 100 | |
| | 0.7 | 10/12/2008 | 12 | 0.26 | ND | 16 | 29 | 20 | ND | 27 | 0.49 | 21 | 94 | |
| TP177 | 0.15 | 06/03/2008 | 12 | 0.41 | ND | 13 | 22 | 18 | ND | 22 | 0.31 | 20 | 72 | |
| TP178 | 0.15 | 06/03/2008 | 24 | 1.3 | 0.59 | 15 | 49 | 30 | ND | 24 | 0.61 | 22 | 160 | |
| | 0.7 | 06/03/2008 | 17 | 0.78 | ND | 15 | 40 | 30 | ND | 22 | 0.66 | 22 | 120 | |
| TP179 | 0.15 | 06/03/2008 | 10 | 0.73 | ND | 19 | 90 | 28 | ND | 29 | 0.38 | 23 | 88 | |
| | 0.9 | 06/03/2008 | 5.4 | 0.81 | ND | 15 | 61 | 23 | ND | 19 | ND | 15 | 47 | |
| | 1.4 | 06/03/2008 | 10 | 0.9 | 0.51 | 18 | 70 | 30 | ND | 30 | 0.31 | 22 | 90 | |
| TP180 | 0.2 | 09/04/2008 | 16 | 0.5 | ND | 17 | 47 | 44 | ND | 26 | 0.5 | 22 | 140 | |
| | 1 | 09/04/2008 | 6.2 | 0.44 | ND | 23 | 38 | 27 | ND | 54 | ND | 22 | 120 | NPT acceptance granted to leave in-situ |

ND - not detected above the method detection limit

**Table 3c - Metal Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Metals |
|---|---|

| RBSL (mg/kg) | | | 64 | | 3.6 | 130 | 478 | 337 | 1 | 50 | 3 | 416 | 3280 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | TOTAL_ARSENIC | TOTAL_BORON | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | Comment where RBSL exceeded |
| | 1.3 | 09/04/2008 | 12 | 0.72 | ND | 18 | 39 | 32 | ND | 33 | 0.38 | 21 | 120 | |
| | 0.15 | 09/04/2008 | 32 | 0.51 | 1 | 16 | 110 | 31 | ND | 25 | 0.84 | 21 | 170 | |
| TP182 | 0.8 | 09/04/2008 | 14 | 0.36 | ND | 16 | 50 | 30 | ND | 34 | 0.51 | 19 | 130 | |
| | 1.1 | 09/04/2008 | 9.9 | 0.26 | ND | 13 | 31 | 18 | ND | 24 | 0.36 | 16 | 67 | |
| TP182 | 0.1 | 08/12/2008 | 6.8 | 0.38 | ND | 13 | 20 | 22 | ND | 28 | ND | 17 | 75 | |
| | 0.7 | 08/12/2008 | 6.7 | 0.84 | ND | 13 | 18 | 21 | ND | 23 | 0.33 | 17 | 67 | |
| | | 04/12/2008 | 11 | 0.48 | 4.8 | 59 | 150 | 190 | | 39 | | 45 | 5400 | Excavated, resampled and passed 20/5/09. |
| TP183 | 0.1 | 20/05/2009 | 16 | 0.58 | 0.45 | 72 | 72 | 150 | ND | 37 | 0.4 | 120 | 490 | |
| | 0.7 | 06/03/2008 | 8.4 | 0.92 | ND | 17 | 27 | 24 | ND | 33 | 0.36 | 19 | 91 | |
| | 0.7 | 04/12/2008 | 7 | 0.62 | ND | 19 | 33 | 35 | ND | 46 | ND | 26 | 260 | |
| | 1.4 | 04/12/2008 | 6.7 | 0.29 | ND | 17 | 30 | 21 | ND | 42 | ND | 18 | 160 | |
| TP184 | 0.1 | 04/12/2008 | 25 | 0.42 | 0.56 | 17 | 340 | 97 | ND | 56 | 0.37 | 26 | 440 | NPT acceptance granted to leave in-situ |
| | 0.7 | 04/12/2008 | 8.3 | 0.61 | ND | 19 | 89 | 43 | ND | 42 | 0.33 | 22 | 140 | |
| | 1.4 | 04/12/2008 | 15 | 0.41 | ND | 9 | 93 | 76 | ND | 51 | 0.34 | 20 | 210 | NPT acceptance granted to leave in-situ |
| | 2.1 | 04/12/2008 | 15 | 0.35 | ND | 17 | 310 | 49 | ND | 48 | 0.31 | 23 | 170 | |
| TP185 | 0.7 | 04/12/2008 | 11 | 0.4 | ND | 18 | 45 | 34 | ND | 53 | ND | 23 | 110 | NPT acceptance granted to leave in-situ |
| | 1.4 | 04/12/2008 | 14 | 0.64 | 0.55 | 21 | 48 | 30 | ND | 64 | ND | 30 | 200 | NPT acceptance granted to leave in-situ |
| | 2.1 | 04/12/2008 | 8.8 | 0.44 | ND | 20 | 49 | 28 | ND | 63 | ND | 20 | 260 | NPT acceptance granted to leave in-situ |
| TP186 | 0.1 | 03/12/2008 | 3.4 | 0.33 | ND | 18 | 42 | 29 | ND | 93 | ND | 20 | 150 | NPT acceptance granted to leave in-situ |
| | 0.7 | 03/12/2008 | 10 | 0.32 | ND | 19 | 39 | 32 | ND | 62 | ND | 19 | 120 | NPT acceptance granted to leave in-situ |
| TP187 | 0.1 | 04/12/2008 | 22 | 0.6 | ND | 12 | 52 | 22 | ND | 21 | 0.41 | 16 | 62 | |
| | 0.7 | 04/12/2008 | 23 | 1.2 | ND | 14 | 59 | 28 | ND | 27 | 0.54 | 24 | 69 | |
| TP188 | 0.1 | 05/12/2008 | 40 | 0.55 | ND | 17 | 40 | 41 | ND | 25 | 0.37 | 34 | 180 | |
| | 0.7 | 05/12/2008 | 11 | 0.57 | ND | 10 | 20 | 19 | ND | 30 | ND | 18 | 75 | |
| TP189 | 0.1 | 09/12/2008 | 56 | 0.68 | 1.6 | 15 | 130 | 45 | ND | 18 | ND | 22 | 170 | |
| TP190 | 0.15 | 06/03/2008 | 7.5 | 0.4 | ND | 14 | 19 | 33 | ND | 29 | 0.34 | 15 | 95 | |
| TP191 | 0.15 | 06/03/2008 | 9.8 | 0.35 | ND | 14 | 31 | 75 | ND | 27 | ND | 15 | 99 | |
| TP192 | 0.2 | 06/03/2008 | 24 | 0.6 | ND | 16 | 31 | 22 | ND | 24 | 0.53 | 20 | 68 | |
| TP193 | 0.15 | 06/03/2008 | 13 | 0.47 | ND | 23 | 41 | 42 | ND | 29 | ND | 22 | 120 | |
| | | 03/12/2008 | 110 | 0.48 | 1.3 | 22 | 560 | 1300 | 0.34 | 48 | 0.55 | 29 | 5600 | Excavated, resampled and passed 29/6/09 |
| | 0.1 | 20/05/2009 | 120 | | 1.1 | 15 | 790 | 1700 | 0.37 | 30 | 0.45 | 18 | 5100 | Excavated, resampled and passed 29/6/09 |
| | | 03/12/2008 | 350 | 0.44 | 2.3 | 19 | 990 | 2500 | 2 | 39 | 0.48 | 29 | 7200 | Excavated, resampled and passed 29/6/09 |
| | 0.7 | 20/05/2009 | 480 | | 1.3 | 16 | 850 | 2300 | 0.58 | 28 | 0.35 | 23 | 4700 | Excavated, resampled and passed 29/6/09 |
| TP196 | | 03/12/2008 | 66 | 0.32 | 1.2 | 14 | 400 | 930 | | 30 | | 19 | 3100 | Excavated, resampled and passed 29/6/09 |
| | 1.4 | 20/05/2009 | 88 | 0.29 | 0.85 | 17 | 640 | 1200 | 1 | 34 | | 21 | 4800 | Excavated, resampled and passed 29/6/09 |
| | | 03/12/2008 | 62 | 0.3 | 1.1 | 15 | 380 | 870 | ND | 29 | ND | 17 | 3300 | Excavated, resampled and passed 29/6/09 |
| | 2.1 | 20/05/2009 | 120 | | 0.97 | 16 | 860 | 1500 | 0.47 | 32 | | 19 | 6800 | Excavated, resampled and passed 29/6/09 |
| | 2.3 | 29/06/2009 | 9.1 | ND | 0.91 | 14 | 21 | 48 | ND | 44 | ND | 15 | 450 | |
| TP197 | 0.1 | 03/12/2008 | 10 | 0.59 | ND | 19 | 32 | 34 | ND | 44 | 0.45 | 23 | 120 | |
| | 0.7 | 03/12/2008 | 11 | 0.32 | ND | 17 | 32 | 32 | ND | 40 | 0.34 | 19 | 140 | |
| TP198 | 0.1 | 05/12/2008 | 17 | 1.3 | ND | 19 | 78 | 110 | ND | 36 | 0.38 | 21 | 300 | |
| | 0.7 | 05/12/2008 | 10 | 0.67 | 0.52 | 14 | 90 | 31 | ND | 23 | 0.6 | 26 | 150 | |
| | 1.4 | 05/12/2008 | 11 | 0.53 | 0.52 | 17 | 63 | 75 | ND | 38 | 0.33 | 22 | 230 | |
| TP199 | 0.1 | 05/12/2008 | 6.1 | 0.78 | 0.9 | 12 | 14 | 15 | ND | 8.2 | 0.54 | 23 | 66 | |
| | 0.7 | 05/12/2008 | 9.9 | 0.59 | ND | 16 | 54 | 21 | ND | 26 | 0.48 | 22 | 120 | |
| | 1.4 | 05/12/2008 | 9.8 | 0.73 | ND | 16 | 42 | 29 | ND | 25 | 0.5 | 22 | 93 | |
| TP200 | 0.1 | 09/12/2008 | 9.7 | 0.42 | ND | 21 | 24 | 21 | ND | 25 | ND | 29 | 91 | |
| | 0.7 | 09/12/2008 | 7.5 | 0.3 | ND | 18 | 19 | 16 | ND | 25 | ND | 25 | 71 | |
| | 1.4 | 09/12/2008 | 8.2 | 0.48 | ND | 14 | 21 | 16 | ND | 23 | ND | 23 | 72 | |
| TP201 | 0.1 | 10/12/2008 | 7.4 | 0.29 | ND | 11 | 17 | 14 | ND | 15 | 0.49 | 20 | 55 | |
| | 0.7 | 10/12/2008 | 4.6 | ND | ND | 12 | 9.7 | 11 | ND | 22 | 0.31 | 15 | 59 | |
| TP202 | 0.15 | 06/03/2008 | 7.8 | 0.5 | ND | 16 | 23 | 23 | ND | 35 | 0.44 | 20 | 92 | |
| | 1.3 | 06/03/2008 | 8.1 | 0.33 | ND | 15 | 23 | 26 | ND | 35 | ND | 15 | 95 | |
| TP203 | 0.2 | 06/03/2008 | 17 | 0.73 | ND | 37 | 91 | 33 | ND | 59 | 0.71 | 32 | 120 | NPT acceptance granted to leave in-situ |
| TP204 | 0.15 | 06/03/2008 | 9.9 | 0.38 | ND | 21 | 33 | 23 | ND | 49 | 0.65 | 23 | 110 | |
| | 0.85 | 06/03/2008 | 7.7 | 0.34 | ND | 22 | 34 | 29 | ND | 57 | 0.52 | 24 | 100 | NPT acceptance granted to leave in-situ |
| TP205 | 0.3 | 09/04/2008 | 10 | 0.42 | ND | 19 | 24 | 21 | ND | 19 | 0.61 | 25 | 73 | |
| | 1.1 | 09/04/2008 | 21 | 0.46 | ND | 17 | 63 | 28 | ND | 22 | 0.53 | 22 | 100 | |
| TP206 | 0.2 | 09/04/2008 | 8.3 | 0.36 | ND | 16 | 17 | 22 | ND | 16 | 0.56 | 24 | 65 | |
| | 1.1 | 09/04/2008 | 9.5 | 0.59 | ND | 15 | 20 | 19 | ND | 21 | 0.45 | 22 | 71 | |
| | 1.4 | 09/04/2008 | 9.2 | 0.37 | ND | 15 | 19 | 19 | ND | 25 | 0.4 | 21 | 72 | |
| TP206 | 0.1 | 08/12/2008 | 14 | 0.49 | ND | 12 | 45 | 30 | ND | 19 | 0.59 | 18 | 88 | |
| | 0.7 | 08/12/2008 | 7.8 | 1.4 | ND | 15 | 22 | 20 | ND | 16 | 0.53 | 18 | 66 | |
| | 1.4 | 08/12/2008 | 5.9 | 0.88 | ND | 16 | 22 | 19 | ND | 37 | ND | 21 | 77 | |
| TP207 | 0.2 | 09/04/2008 | 31 | 0.5 | 1.1 | 16 | 100 | 47 | ND | 24 | 0.65 | 19 | 140 | |
| TP207 | 0.1 | 08/12/2008 | 4.6 | 2.5 | ND | 17 | 23 | 17 | ND | 42 | 0.5 | 19 | 66 | |
| | 0.7 | 08/12/2008 | 5.3 | 1.5 | ND | 18 | 28 | 25 | ND | 59 | 0.34 | 21 | 82 | NPT acceptance granted to leave in-situ |
| | | 03/12/2008 | 46 | 0.75 | 0.95 | 30 | 230 | 710 | 2.1 | 38 | 0.35 | 29 | 1900 | Excavated, resampled and passed 29/6/09 |
| | 0.1 | 20/05/2009 | 60 | 0.46 | 1.1 | 28 | 280 | 680 | 0.45 | 38 | | 30 | 3600 | Excavated, resampled and passed 29/6/09 |
| | | 03/12/2008 | 65 | 0.47 | 1.8 | 27 | 200 | 690 | 0.3 | 32 | 0.44 | 31 | 1500 | Excavated, resampled and passed 29/6/09 |
| TP208 | 0.7 | 20/05/2009 | 58 | 0.52 | 1 | 31 | 260 | 640 | ND | 27 | ND | 31 | 1900 | Excavated, resampled and passed 29/6/09 |
| | 1.4 | 03/12/2008 | 14 | 0.57 | ND | 13 | 82 | 54 | ND | 12 | 0.79 | 25 | 110 | |
| | 2.1 | 03/12/2008 | 39 | 0.35 | 0.93 | 30 | 160 | 360 | | 31 | 0.49 | 29 | 860 | Excavated, resampled and passed 29/6/09 |
| | 2.2 | 29/06/2009 | 45 | 0.52 | 1 | 29 | 110 | 330 | ND | 33 | 0.56 | 26 | 560 | |
| TP209 | 0.1 | 03/12/2008 | 35 | 0.43 | 0.67 | 17 | 80 | 140 | ND | 40 | 0.44 | 25 | 330 | |
| | 0.7 | 03/12/2008 | 32 | 0.62 | ND | 16 | 89 | 75 | ND | 35 | 0.56 | 21 | 200 | |
| | 1.4 | 03/12/2008 | 21 | 0.63 | ND | 16 | 75 | 50 | ND | 32 | 0.6 | 21 | 140 | |
| | 2.1 | 03/12/2008 | 18 | 0.49 | ND | 19 | 36 | 30 | ND | 37 | ND | 23 | 110 | |
| | 2.8 | 03/12/2008 | 13 | 0.67 | ND | 16 | 33 | 24 | ND | 42 | 0.39 | 20 | 100 | |
| TP210 | 0.1 | 03/12/2008 | 36 | 0.46 | 0.7 | 18 | 190 | 430 | ND | 29 | 0.42 | 23 | 890 | NPT acceptance granted to leave in-situ |
| | 0.7 | 03/12/2008 | 30 | 0.27 | 0.74 | 18 | 200 | 330 | ND | 32 | 0.46 | 24 | 950 | |
| TP211 | 0.1 | 05/12/2008 | 18 | 0.3 | 0.97 | 20 | 51 | 90 | ND | 41 | 0.39 | 27 | 220 | |
| | 0.4 | 05/12/2008 | 38 | 0.43 | 0.56 | 16 | 100 | 39 | ND | 26 | 0.66 | 26 | 96 | |
| | 0.7 | 05/12/2008 | 41 | 0.48 | 0.55 | 15 | 110 | 40 | ND | 26 | 0.57 | 22 | 85 | |
| | 2.1 | 05/12/2008 | 6.5 | 0.61 | ND | 15 | 17 | 23 | ND | 33 | 0.38 | 21 | 90 | |
| | 2.8 | 05/12/2008 | 11 | 0.54 | 0.56 | 15 | 24 | 24 | ND | 31 | 0.41 | 21 | 96 | |
| TP212 | 0.1 | 09/12/2008 | 23 | 0.67 | ND | 16 | 59 | 44 | ND | 20 | 0.33 | 24 | 130 | |
| | 0.7 | 09/12/2008 | 18 | 0.6 | ND | 16 | 57 | 59 | ND | 21 | 0.3 | 22 | 160 | |
| TP213 | 0.1 | 10/12/2008 | 59 | 0.72 | 1.8 | 17 | 160 | 87 | ND | 28 | 0.54 | 27 | 260 | |
| | 0.7 | 10/12/2008 | 8.2 | 0.3 | ND | 13 | 23 | 24 | ND | 27 | ND | 19 | 83 | |
| | 1.4 | 10/12/2008 | 13 | 0.33 | ND | 14 | 35 | 32 | ND | 29 | ND | 20 | 100 | |
| | 2.1 | 10/12/2008 | 17 | 0.45 | 0.56 | 24 | 60 | 130 | ND | 30 | 0.39 | 22 | 110 | |
| TP214 | 0.1 | 04/12/2008 | 12 | 0.43 | ND | 14 | 39 | 32 | ND | 25 | 0.32 | 20 | 130 | |
| | 0.7 | 04/12/2008 | 15 | 0.35 | ND | 13 | 20 | 17 | ND | 25 | 0.33 | 19 | 78 | |
| | 1.4 | 04/12/2008 | 11 | 0.3 | ND | 14 | 21 | 20 | ND | 36 | ND | 18 | 100 | |

ND - not detected above the method detection limit

**Table 3c - Metal Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Metals |
|---|---|

| RBSL (mg/kg) | | | 64 | | 3.6 | 130 | 478 | 337 | 1 | 50 | 3 | 416 | 3280 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | TOTAL_ARSENIC | TOTAL_BORON | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | Comment where RBSL exceeded |
| TP215 | 0.1 | 08/12/2008 | 10 | 0.48 | ND | 15 | 38 | 41 | ND | 50 | 0.42 | 28 | 120 | |
| | 0.7 | 08/12/2008 | 5.9 | 0.47 | ND | 12 | 14 | 25 | ND | 42 | ND | 22 | 120 | |
| TP216 | 0.1 | 08/12/2008 | 6.7 | 0.27 | ND | 22 | 32 | 180 | ND | 70 | ND | 27 | 160 | NPT acceptance granted to leave in-situ |
| TP217 | 0.3 | 09/04/2008 | 48 | 0.49 | 0.84 | 17 | 140 | 42 | ND | 23 | 0.51 | 23 | 140 | |
| | 0.8 | 09/04/2008 | 3.4 | ND | ND | 13 | 8.5 | 37 | ND | 27 | ND | 11 | 83 | |
| | 1.1 | 09/04/2008 | 14 | 0.35 | ND | 16 | 46 | 26 | ND | 29 | ND | 16 | 100 | |
| TP218 | 0.3 | 09/04/2008 | 11 | 0.62 | ND | 18 | 25 | 22 | ND | 17 | 0.62 | 26 | 88 | |
| | 1 | 09/04/2008 | 18 | 0.55 | 0.51 | 17 | 57 | 29 | ND | 20 | 0.61 | 25 | 120 | |
| | 1.6 | 09/04/2008 | 6.5 | 0.41 | ND | 21 | 33 | 20 | ND | 44 | ND | 22 | 82 | |
| TP218 | 0.1 | 08/12/2008 | 20 | 0.5 | 0.52 | 17 | 78 | 84 | ND | 33 | 0.45 | 24 | 170 | |
| | 0.7 | 08/12/2008 | 6.5 | 0.53 | ND | 21 | 35 | 23 | ND | 51 | ND | 24 | 97 | NPT acceptance granted to leave in-situ |
| | 1.4 | 08/12/2008 | 6.6 | 0.37 | ND | 21 | 36 | 25 | ND | 67 | ND | 27 | 110 | NPT acceptance granted to leave in-situ |
| TP219 | 0.1 | 08/12/2008 | 16 | 1.5 | ND | 19 | 54 | 55 | ND | 37 | 0.37 | 22 | 130 | |
| | 0.7 | 08/12/2008 | 12 | 0.52 | ND | 18 | 42 | 50 | ND | 69 | 0.44 | 34 | 110 | NPT acceptance granted to leave in-situ |
| TP219 | 0.15 | 09/04/2008 | 15 | 0.48 | ND | 17 | 50 | 57 | ND | 37 | 0.34 | 20 | 130 | |
| | 1.1 | 09/04/2008 | 34 | 0.62 | 1.1 | 21 | 96 | 97 | ND | 31 | 0.52 | 25 | 210 | |
| TP220 | 0.1 | 03/12/2008 | 18 | 0.55 | 0.55 | 16 | 52 | 64 | ND | 38 | 0.33 | 24 | 150 | |
| | 0.7 | 03/12/2008 | 18 | 0.53 | 0.55 | 16 | 45 | 320 | ND | 34 | 0.43 | 22 | 130 | |
| | 1.4 | 03/12/2008 | 40 | 0.98 | ND | 14 | 85 | 55 | ND | 23 | 0.61 | 24 | 110 | |
| | 2.1 | 03/12/2008 | 32 | 0.53 | ND | 14 | 70 | 68 | ND | 26 | 0.58 | 23 | 190 | |
| TP221 | 0.1 | 03/12/2008 | 35 | 0.37 | 0.85 | 16 | 100 | 230 | ND | 28 | 0.51 | 27 | 780 | |
| | 0.7 | 03/12/2008 | 12 | ND | ND | 17 | 29 | 31 | ND | 44 | ND | 20 | 92 | |
| | 1.4 | 03/12/2008 | 50 | 0.97 | ND | 14 | 73 | 50 | ND | 15 | 0.79 | 25 | 51 | |
| | 2.1 | 03/12/2008 | 20 | 0.46 | ND | 15 | 41 | 28 | ND | 31 | 0.44 | 21 | 92 | |
| TP222 | 0.1 | 05/12/2008 | 25 | 0.5 | 0.91 | 16 | 58 | 64 | ND | 33 | 0.42 | 23 | 180 | |
| | 0.7 | 05/12/2008 | 21 | 0.41 | 0.68 | 24 | 56 | 200 | ND | 48 | ND | 22 | 330 | |
| TP225 | 0.1 | 04/12/2008 | 8.9 | 0.52 | ND | 15 | 24 | 16 | ND | 32 | ND | 20 | 110 | |
| | 0.7 | 04/12/2008 | 30 | 0.41 | 0.57 | 16 | 66 | 180 | ND | 29 | 0.34 | 23 | 320 | |
| | 1.4 | 04/12/2008 | 18 | 0.35 | 0.6 | 15 | 49 | 78 | ND | 36 | ND | 19 | 170 | |
| TP226 | 0.1 | 04/12/2008 | 50 | 1.4 | ND | 15 | 64 | 21 | ND | 18 | 0.77 | 26 | 72 | |
| | 0.7 | 04/12/2008 | 21 | 1.2 | ND | 13 | 70 | 15 | ND | 22 | 0.49 | 23 | 67 | |
| | 1.4 | 04/12/2008 | 9.7 | 0.91 | ND | 12 | 47 | 14 | ND | 25 | ND | 16 | 72 | |
| | 2.1 | 04/12/2008 | 6.6 | 0.35 | ND | 15 | 41 | ND | ND | 42 | ND | 19 | 110 | |
| TP227 | 0.1 | 04/12/2008 | 6.2 | 0.32 | ND | 17 | 22 | 17 | ND | 41 | 0.3 | 22 | 100 | |
| | 0.7 | 04/12/2008 | 5.9 | 0.3 | ND | 18 | 23 | 15 | ND | 50 | ND | 27 | 94 | |
| | 1.4 | 04/12/2008 | 5.5 | ND | ND | 17 | 23 | 16 | ND | 53 | ND | 21 | 86 | NPT acceptance granted to leave in-situ |
| | 2.1 | 04/12/2008 | 4.7 | 0.3 | ND | 16 | 18 | 12 | ND | 44 | ND | 19 | 83 | |
| TP228 | 0.1 | 16/01/2009 | 5.3 | 0.49 | ND | 16 | 21 | 23 | ND | 34 | ND | 18 | 87 | |
| | 0.7 | 16/01/2009 | 4.1 | 0.31 | ND | 17 | 11 | 15 | ND | 31 | ND | 16 | 66 | |
| TP229 | 0.1 | 08/12/2008 | 8.8 | 0.72 | ND | 14 | 19 | 20 | ND | 17 | 0.35 | 23 | 60 | |
| | 0.7 | 08/12/2008 | 5.9 | 0.4 | ND | 18 | 23 | 17 | ND | 46 | 0.38 | 19 | 83 | |
| | 1.4 | 08/12/2008 | 5.3 | 0.6 | ND | 19 | 31 | 22 | ND | 63 | ND | 21 | 94 | NPT acceptance granted to leave in-situ |
| | 2.1 | 08/12/2008 | 3.2 | 0.45 | ND | 13 | 8.3 | 13 | ND | 32 | ND | 13 | 61 | |
| | 2.8 | 08/12/2008 | 4.7 | 0.25 | ND | 13 | 12 | 17 | ND | 41 | ND | 19 | 69 | |
| TP230 | 0.2 | 09/04/2008 | 32 | 0.67 | 0.87 | 18 | 150 | 700 | | 35 | 0.42 | 26 | 400 | Excavated, resampled and passed 5/12/08 |
| | 1.2 | 09/04/2008 | 19 | 0.48 | 0.67 | 19 | 78 | 76 | ND | 42 | 0.64 | 22 | 190 | |
| TP230B | 0 | 22/05/2008 | 13 | 0.35 | ND | 21 | 43 | 40 | ND | 42 | 0.41 | 21 | 120 | |
| TP230E | 0 | 22/05/2008 | 30 | 0.66 | 0.87 | 27 | 110 | 120 | ND | 41 | 0.56 | 31 | 270 | |
| TP230N | 0 | 22/05/2008 | 31 | 0.63 | 0.72 | 40 | 94 | 100 | ND | 31 | 0.65 | 23 | 200 | |
| TP230S | 0 | 22/05/2008 | 18 | 0.55 | 0.77 | 18 | 53 | 25 | ND | 33 | 1.2 | 22 | 200 | |

ND - not detected above the method detection limit

**Table 3c - Metal Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Metals |
|---|---|

| RBSL (mg/kg) | | | 64 | | 3.6 | 130 | 478 | 337 | 1 | 50 | 3 | 416 | 3280 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | TOTAL_ARSENIC | TOTAL_BORON | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | Comment where RBSL exceeded |
| TP230W | 0 | 22/05/2008 | 31 | 0.5 | 0.8 | 130 | 110 | 100 | ND | 93 | 0.93 | 27 | 210 | Excavated, resampled and passed 5/12/08 |
| TP230 | 0.1 | 05/12/2008 | 5.9 | 0.65 | ND | 20 | 30 | 21 | ND | 57 | ND | 22 | 94 | NPT acceptance granted to leave in-situ |
| TP231 | 0.1 | 04/12/2008 | 9.3 | ND | ND | 11 | 18 | 13 | ND | 25 | ND | 16 | 70 | |
| | 0.7 | 04/12/2008 | 5.1 | ND | ND | 53 | 11 | 15 | ND | 69 | ND | 27 | 83 | NPT acceptance granted to leave in-situ |
| TP232 | 0.1 | 04/12/2008 | 33 | 0.54 | 0.76 | 15 | 100 | 38 | ND | 25 | 0.4 | 21 | 130 | |
| | 0.7 | 04/12/2008 | 16 | 0.46 | 0.71 | 16 | 55 | 37 | ND | 42 | 0.35 | 22 | 130 | |
| | 1.4 | 04/12/2008 | 11 | 0.44 | 0.52 | 18 | 37 | 21 | ND | 48 | ND | 25 | 130 | |
| TP233 | 0.1 | 04/12/2008 | 43 | 0.9 | 0.53 | 18 | 83 | 44 | ND | 33 | 0.8 | 24 | 140 | |
| | 0.7 | 04/12/2008 | 23 | 0.58 | 0.52 | 24 | 73 | 32 | ND | 47 | 0.37 | 28 | 120 | |
| | 1.4 | 04/12/2008 | 9.7 | 0.54 | ND | 18 | 36 | 22 | ND | 59 | 0.3 | 28 | 110 | NPT acceptance granted to leave in-situ |
| | 2.1 | 04/12/2008 | 7.9 | 0.33 | ND | 19 | 27 | 14 | ND | 58 | ND | 26 | 90 | NPT acceptance granted to leave in-situ |
| TP234 | 0.1 | 08/12/2008 | 9.2 | 0.53 | ND | 20 | 29 | 22 | ND | 36 | 0.57 | 26 | 94 | |
| | 0.7 | 08/12/2008 | 9.9 | 0.53 | ND | 19 | 33 | 25 | ND | 38 | 0.44 | 24 | 100 | |
| | 1.4 | 08/12/2008 | 8.9 | 0.38 | ND | 18 | 28 | 24 | ND | 42 | 0.39 | 29 | 92 | |
| TP235 | 0.1 | 08/12/2008 | 6.2 | ND | ND | 13 | 13 | 18 | ND | 29 | ND | 16 | 81 | |
| | 0.7 | 08/12/2008 | 7.2 | 0.42 | 0.56 | 15 | 17 | 19 | ND | 33 | ND | 18 | 370 | |
| | 1.4 | 08/12/2008 | 8.3 | 0.31 | 0.67 | 14 | 19 | 24 | ND | 26 | 0.34 | 17 | 580 | |
| | 2.1 | 08/12/2008 | 10 | 0.4 | 1.8 | 17 | 32 | 35 | ND | 42 | 0.31 | 22 | 1100 | |
| TP236 | 0.2 | 09/04/2008 | 84 | 0.78 | 0.98 | 24 | 240 | 140 | | 24 | 1 | 26 | 270 | Excavated, resampled and passed 8/12/08 |
| | 0.9 | 09/04/2008 | 58 | 0.54 | 2.7 | 21 | 150 | 590 | | 36 | 0.63 | 23 | 1400 | Excavated, resampled and passed 8/12/08 |
| TP236B | 0 | 22/05/2008 | 14 | 0.35 | 0.52 | 15 | 34 | 21 | ND | 30 | 0.87 | 20 | 120 | |
| TP236E | 0 | 22/05/2008 | 85 | 0.98 | 2 | 19 | 150 | 250 | 0.89 | 29 | 0.94 | 23 | 520 | Excavated, resampled and passed 8/12/08 |
| TP236N | 0 | 22/05/2008 | 29 | 0.46 | 1.9 | 18 | 88 | 450 | | 21 | 1 | 28 | 2600 | Excavated, resampled and passed 8/12/08 |
| TP236S | 0 | 22/05/2008 | 78 | 0.63 | 2.2 | 16 | 150 | 260 | | 27 | 1.1 | 25 | 600 | Excavated, resampled and passed 8/12/08 |
| TP236W | 0 | 22/05/2008 | 15 | 0.63 | ND | 17 | 50 | 26 | ND | 28 | 1.4 | 21 | 100 | |
| TP236 | 0.1 | 08/12/2008 | 7.3 | 0.37 | ND | 16 | 27 | 21 | ND | 38 | 0.46 | 22 | 140 | |
| | 0.7 | 08/12/2008 | 3.2 | 0.45 | ND | 13 | 6.3 | 14 | ND | 28 | ND | 14 | 66 | |
| | 1.4 | 08/12/2008 | 4.2 | 0.45 | ND | 13 | 7.9 | 12 | ND | 31 | ND | 13 | 60 | |
| TP237 | 0.1 | 08/12/2008 | 9.3 | 0.29 | ND | 13 | 38 | 61 | ND | 26 | ND | 15 | 120 | |
| TP238 | 0.1 | 08/12/2008 | 9.8 | 2.1 | ND | 14 | 20 | 22 | ND | 27 | 0.86 | 21 | 89 | |
| | 0.7 | 08/12/2008 | 7.8 | 0.4 | ND | 11 | 17 | 15 | ND | 25 | 0.43 | 18 | 72 | |
| | 1.4 | 08/12/2008 | 6.8 | 0.41 | ND | 11 | 14 | 16 | ND | 31 | ND | 21 | 75 | |
| TP239 | 0.1 | 08/12/2008 | 10 | 0.39 | ND | 14 | 29 | 37 | ND | 39 | ND | 16 | 120 | |
| TP240 | 0.1 | 04/12/2008 | 7.9 | 0.53 | ND | 18 | 31 | 14 | ND | 40 | ND | 22 | 98 | |
| | 0.7 | 04/12/2008 | 8.3 | 0.34 | ND | 18 | 27 | 14 | ND | 41 | ND | 21 | 100 | |
| | 1.4 | 04/12/2008 | 6.6 | 0.45 | ND | 18 | 31 | 25 | ND | 47 | ND | 21 | 160 | |
| TP241 | 0.1 | 04/12/2008 | 18 | 0.54 | ND | 17 | 50 | 27 | ND | 27 | 0.55 | 27 | 98 | |
| | 0.7 | 04/12/2008 | 6 | 0.31 | ND | 15 | 14 | ND | ND | 40 | ND | 19 | 79 | |
| | 1.4 | 04/12/2008 | 6.1 | 0.32 | ND | 14 | 12 | ND | ND | 45 | ND | 17 | 70 | |
| TP242 | 0.1 | 05/12/2008 | 10 | 0.67 | ND | 12 | 35 | 21 | ND | 13 | 0.89 | 23 | 56 | |
| | 0.7 | 05/12/2008 | 19 | 0.52 | ND | 15 | 61 | 38 | ND | 25 | 0.62 | 21 | 95 | |
| | 1.4 | 05/12/2008 | 10 | 0.45 | ND | 14 | 28 | 20 | ND | 30 | 0.47 | 19 | 83 | |
| TP242 | 0.2 | 10/04/2008 | 21 | 0.74 | ND | 13 | 100 | 29 | ND | 13 | 0.59 | 18 | 53 | |
| | 1 | 10/04/2008 | 8.9 | 0.34 | ND | 14 | 47 | 18 | ND | 22 | 0.61 | 16 | 71 | |
| | 1.7 | 10/04/2008 | 9.8 | 0.51 | ND | 16 | 43 | 35 | ND | 31 | 0.52 | 18 | 92 | |
| | 2.1 | 10/04/2008 | 39 | 0.58 | 0.7 | 17 | 100 | 48 | ND | 39 | 0.5 | 20 | 120 | |
| TP243 | 0.2 | 09/04/2008 | 63 | 0.55 | 3.4 | 17 | 250 | 65 | ND | 23 | 0.92 | 27 | 240 | |
| | 1.2 | 09/04/2008 | 17 | 0.77 | 0.78 | 17 | 56 | 39 | ND | 24 | 0.69 | 24 | 130 | |
| | 1.7 | 09/04/2008 | 10 | 0.55 | ND | 16 | 25 | 26 | ND | 28 | 0.5 | 23 | 90 | |
| | 2.4 | 09/04/2008 | 13 | 0.3 | ND | 18 | 38 | 38 | ND | 31 | 0.44 | 23 | 91 | |
| TP243 | 0.1 | 16/01/2009 | 6.4 | ND | ND | 17 | 11 | 19 | ND | 47 | ND | 28 | 76 | |
| TP244 | 0.1 | 08/12/2008 | 12 | 0.46 | ND | 35 | 55 | 77 | ND | 45 | 0.38 | 28 | 150 | |
| TP244 | 0.2 | 09/04/2008 | 15 | 0.48 | 0.61 | 96 | 75 | 120 | ND | 23 | ND | 58 | 230 | |
| | 0.8 | 09/04/2008 | 7.1 | 0.38 | | 21 | 37 | 40 | | 75 | | 22 | 110 | Excavated, resampled and passed 8/12/08 |
| TP244B | 0 | 22/05/2008 | 30 | 0.45 | 0.87 | 48 | 92 | 56 | ND | 34 | 0.68 | 38 | 150 | |
| TP245 | 0.1 | 04/12/2008 | 6.5 | ND | ND | 15 | 22 | 12 | ND | 43 | ND | 21 | 130 | |
| | 0.7 | 04/12/2008 | 6.4 | 0.3 | ND | 15 | 18 | 31 | ND | 41 | ND | 20 | 110 | |
| | 1.4 | 04/12/2008 | 5.2 | 0.38 | ND | 13 | 12 | 12 | ND | 41 | ND | 15 | 83 | |
| | 2.1 | 04/12/2008 | 12 | ND | ND | 12 | 16 | ND | ND | 40 | ND | 15 | 86 | |
| TP246 | 0.1 | 09/12/2008 | 45 | 0.36 | ND | 13 | 72 | 37 | ND | 18 | 0.58 | 22 | 86 | |
| | 0.7 | 09/12/2008 | 23 | 0.47 | ND | 12 | 95 | 35 | ND | 18 | 0.75 | 20 | 68 | |
| | 1.4 | 09/12/2008 | 8.7 | 0.27 | ND | 13 | 32 | 17 | ND | 27 | 0.42 | 20 | 80 | |
| | 2.1 | 09/12/2008 | 5.1 | 0.65 | ND | 11 | 15 | 12 | ND | 29 | ND | 14 | 70 | |
| TP247 | 0.1 | 05/12/2008 | 5.7 | 0.34 | ND | 14 | 14 | 19 | ND | 37 | ND | 16 | 76 | |
| | 0.7 | 05/12/2008 | 6.7 | 0.32 | ND | 14 | 15 | 20 | ND | 38 | ND | 19 | 75 | |
| TP247 | 0.2 | 10/04/2008 | 8.6 | 0.4 | ND | 16 | 20 | 17 | ND | 27 | 0.69 | 18 | 90 | |
| | 0.9 | 10/04/2008 | 5.3 | ND | ND | 14 | 10 | 15 | ND | 32 | ND | 12 | 64 | |
| TP248 | 0.1 | 05/12/2008 | 9.2 | 0.45 | ND | 14 | 20 | 25 | ND | 43 | ND | 20 | 85 | |
| TP248 | 0.2 | 09/04/2008 | 9.9 | 0.68 | 1.1 | 21 | 58 | 29 | | 58 | 0.43 | 21 | 270 | Excavated, resampled and passed 5/12/08 |
| | 1.3 | 09/04/2008 | 20 | 0.47 | 0.95 | 19 | 87 | 39 | ND | 47 | 0.46 | 20 | 160 | |
| TP249 | 0.3 | 10/04/2008 | 7.1 | 0.4 | ND | 11 | 16 | 16 | ND | 9.2 | 0.48 | 20 | 63 | |
| | 1 | 10/04/2008 | 15 | 0.6 | 0.61 | 13 | 45 | 20 | ND | 27 | 0.41 | 15 | 110 | |
| | 1.7 | 10/04/2008 | 9.7 | 0.28 | ND | 14 | 22 | 19 | ND | 33 | ND | 15 | 80 | |
| TP249 | 0.1 | 08/12/2008 | 5.7 | 0.55 | ND | 13 | 12 | 18 | ND | 36 | ND | 16 | 72 | |
| TP250 | 0.1 | 09/12/2008 | 10 | 0.47 | ND | 15 | 32 | 56 | ND | 26 | 0.54 | 21 | 150 | |
| TP251 | 0.1 | 09/12/2008 | 5.5 | ND | ND | 17 | 28 | 23 | ND | 50 | ND | 23 | 97 | |
| TP252 | 0.2 | 10/04/2008 | 6.5 | 0.47 | 0.7 | 13 | 18 | 21 | ND | 30 | 0.32 | 14 | 100 | |
| | 0.5 | 10/04/2008 | 8.5 | 0.4 | ND | 16 | 19 | 24 | ND | 39 | 0.32 | 19 | 110 | |

ND - not detected above the method detection limit

**Table 3d - Polycyclic Aromatic Hydrocarbon (PAH) Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | PAH |
|---|---|

| RBSL (mg/kg) | | | | | | | 0.9 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | BENZO_A_ANTHRACENE | BENZO_A_PYRENE | BENZO_B_FLUORANTHENE | BENZO_G_H_I_PERYLENE | BENZO_K_FLUORANTHENE | CHRYSENE | DIBENZ_A_H_ANTHRACENE | FLUORANTHENE | FLUORENE | INDENO_1_2_3_CD_PYRENE | NAPHTHALENE | PHENANTHRENE | PYRENE | Comment where RBSL exceeded |
| CE01N | 0.5 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE01S | 0.5 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE02N | 1.5 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE02S | 1.5 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE03 | 1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | | 09/12/2008 | 2.7 | | 2.6 | 9.4 | 10 | 15 | 5.5 | 5.5 | 10 | 1.8 | 16 | 2.1 | 6.6 | | 11 | 13 | Excavated, resampled and passed 20/5/09. |
| CE04 | 1 | 20/05/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE05 | 1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE06B | 1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE06N | 1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE06S | 1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE07 | 3 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE08 | 3 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE09 | 3 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| CE10 | 3 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP001 | 0.7 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP002 | 0.1 | 20/05/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 20/05/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP003 | 0.7 | 20/05/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP004 | 0.95 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP006 | 0.6 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP007 | 1 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP008 | 0.5 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP009 | 0.45 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP010 | 1.4 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP011 | 0.6 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.1 | ND | |
| TP012 | 0.5 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP013 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP014 | 0 | 02/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP015 | 0.5 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP017 | 0.1 | 20/05/2009 | ND | ND | ND | ND | ND | 1.4 | ND | ND | 2 | ND | ND | ND | 1.1 | ND | ND | ND | |
| TP018 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP019 | 0.4 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP020 | 0.75 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP021 | 0 | 02/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP022 | 0.5 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP023 | 0.75 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP024 | 0.1 | 20/05/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP025 | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP026 | 0.5 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP027 | 0.8 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP028 | 0.9 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP029 | 0.1 | 20/05/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP030 | 0.15 | 05/03/2008 | ND | ND | ND | ND | 2.4 | 2.2 | 1.6 | ND | ND | ND | 2.1 | ND | 1.6 | ND | 1.1 | 1.9 | NPT acceptance granted to leave in-situ |
| TP030B | 0 | 20/05/2008 | ND | ND | ND | 1.2 | 1.5 | 2.1 | 1.7 | ND | 1.3 | ND | 1.8 | ND | 1.5 | ND | ND | 1.5 | NPT acceptance granted to leave in-situ |
| TP030E | 0 | 20/05/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP030N | 0 | 20/05/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP030S | 0 | 20/05/2008 | ND | ND | ND | 1.7 | 2.3 | 3 | 2.4 | 1.3 | 2.2 | ND | 2.4 | ND | 2.4 | ND | 1.3 | 2.2 | NPT acceptance granted to leave in-situ |
| TP030W | 0 | 20/05/2008 | ND | ND | ND | 1.4 | 1.6 | 2.4 | 1.6 | ND | 1.6 | ND | 1.8 | ND | 1.5 | ND | 1.1 | 1.7 | NPT acceptance granted to leave in-situ |
| | 0.2 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP031 | 0.9 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP032 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.14 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP033 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP034 | 1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP035 | 0.9 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP036 | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP037 | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.2 | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP038 | 0.9 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP039 | 0.85 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.05 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP040 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.8 | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP041 | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.55 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP042 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP043 | 0.95 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP044 | 0.8 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP045 | 0.6 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP046 | 0 | 02/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP047 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |

ND - note detected above the method detection limit

**Table 3d - Polycyclic Aromatic Hydrocarbon (PAH) Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | PAH |
|---|---|

| RBSL (mg/kg) | | | 0.9 | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | BENZO_A_ANTHRACENE | BENZO_A_PYRENE | BENZO_B_FLUORANTHENE | BENZO_G_H_I_PERYLENE | BENZO_K_FLUORANTHENE | CHRYSENE | DIBENZ_A_H_ANTHRACENE | FLUORANTHENE | FLUORENE | INDENO_1_2_3_CD_PYRENE | NAPHTHALENE | PHENANTHRENE | PYRENE | Comment where RBSL exceeded |
| TP048 | 0.1 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.3 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP049 | 1.7 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP050 | 0.9 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP051 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP052 | 1.4 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP053 | 0.1 | 03/12/2008 | ND | ND | ND | 2.4 | 2.7 | 4 | 2.3 | 1.4 | 3 | ND | 3.5 | ND | 2.4 | ND | 1.9 | 3.3 | NPT acceptance granted to leave in-situ |
| TP054 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP055 | 2 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP056 | 1 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP057 | 0 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP058 | 1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP059 | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 7.8 | 2 | |
| TP060 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP061 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP062 | 1.2 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP063 | 0.85 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP064 | 0 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP065 | 0.65 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP068 | 0.5 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP069 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP070 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP071 | 1.2 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 05/03/2008 | | | | | | | | | | | | | | ND | | | |
| TP072 | 0.55 | 05/03/2008 | | | | | | | | | | | | | | ND | | | |
| TP073 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP074 | 0.95 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP077 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP078 | 0.7 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP079 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP080 | 1.2 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP081 | 1.1 | 04/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP082 | 0 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP083 | 0.5 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP084 | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP087 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP088 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.5 | ND | ND | ND | ND | ND | |
| TP089 | 0.1 | 02/12/2008 | ND | ND | ND | ND | 1.8 | 2 | 1.6 | ND | 1.5 | ND | 3 | ND | 1.7 | ND | ND | 2.7 | NPT acceptance granted to leave in-situ |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP090 | 1.2 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP091 | 0.2 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP092 | 0 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP093 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP094 | 0.6 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP098 | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP099 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP100 | 0.7 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP101 | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP102 | 0.7 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP103 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP104 | 0.8 | 03/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP107 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP108 | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP109 | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP110 | 1.4 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP111 | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | |
| TP112 | 0.65 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP113 | 0 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP114 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP119 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP120 | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP121 | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP122 | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP123 | 0.95 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP124 | 0 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP125 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP126 | 0.85 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP130 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP131 | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |

ND - note detected above the method detection limit

**Table 3d - Polycyclic Aromatic Hydrocarbon (PAH) Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | PAH |
|---|---|

| RBSL (mg/kg) | | | | | | | 0.9 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | BENZO_A_ANTHRACENE | BENZO_A_PYRENE | BENZO_B_FLUORANTHENE | BENZO_G_H_I_PERYLENE | BENZO_K_FLUORANTHENE | CHRYSENE | DIBENZ_A_H_ANTHRACENE | FLUORANTHENE | FLUORENE | INDENO_1_2_3_CD_PYRENE | NAPHTHALENE | PHENANTHRENE | PYRENE | Comment where RBSL exceeded |
| | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP132 | 0.7 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP133 | 1.5 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 09/12/2008 | ND | ND | 1.4 | 5.5 | 4.7 | 4.8 | 2 | 2.5 | 4.8 | ND | 12 | ND | 2.2 | ND | 2 | 11 | NPT acceptance granted to leave in-situ |
| TP134 | 1.4 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP135 | 0 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP136 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP137 | 0.85 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP141 | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP142 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP143 | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP144 | 2.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP145 | 0.85 | 05/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP146 | 0 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP147 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP151 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP152 | 0.7 | 03/12/2008 | ND | ND | ND | 2.3 | 2.5 | 3.8 | 2.3 | 1.4 | 2.7 | ND | 3.1 | ND | 2.3 | ND | 1.4 | 3 | NPT acceptance granted to leave in-situ |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.5 | ND | ND | ND | 1.1 | 1.4 | |
| TP153 | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP154 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP155 | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP156 | 0 | 01/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP171 | 0.2 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP180 | 1.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.8 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP182 | 1.1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP205 | 1.1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP206 | 1.4 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP207 | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.8 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP217 | 1.1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP218 | 1.6 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP219 | 1.1 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.5 | ND | ND | ND | ND | ND | |
| TP230 | 1.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP236 | 0.9 | 09/04/2008 | | | | 3.1 | 2.4 | 2.5 | 1.5 | 1.7 | 3.1 | | 7.2 | | 1.7 | | 4.3 | 4.8 | Excavated, resampled and passed 8/12/08. |
| TP236B | 0 | 22/05/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP236E | 0 | 22/05/2008 | | | | | 4 | 6.1 | | 2.3 | 5.4 | | 8 | | 3.2 | | 4.9 | 5.7 | Excavated, resampled and passed 8/12/08. |
| TP236E | 0 | 02/07/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP236N | 0 | 22/05/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.5 | ND | |
| TP236S | 0 | 22/05/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP236W | 0 | 22/05/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.7 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP242 | 2.1 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.7 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP243 | 2.4 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 09/04/2008 | | | 1.6 | 6.2 | 6.4 | 7.4 | 4.4 | 3.2 | 5.9 | | 13 | | 6.7 | | 7.6 | 9.6 | Excavated, resampled and passed 8/12/08. |
| TP244 | 0.8 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP244B | 0 | 22/05/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP247 | 0.9 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP248 | 1.3 | 09/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.3 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP249 | 1.7 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.2 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP252 | 0.5 | 10/04/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.7 | ND | ND | ND | 1.1 | 1.4 | |
| MS189 | 1.5 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP157 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP158 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP162 | 0.1 | 01/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP163 | 1.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP164 | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |

ND - note detected above the method detection limit

**Table 3d - Polycyclic Aromatic Hydrocarbon (PAH) Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | PAH |
|---|---|

| RBSL (mg/kg) | | | | | | | 0.9 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | BENZO_A_ANTHRACENE | BENZO_A_PYRENE | BENZO_B_FLUORANTHENE | BENZO_G_H_I_PERYLENE | BENZO_K_FLUORANTHENE | CHRYSENE | DIBENZ_A_H_ANTHRACENE | FLUORANTHENE | FLUORENE | INDENO_1_2_3_CD_PYRENE | NAPHTHALENE | PHENANTHRENE | PYRENE | Comment where RBSL exceeded |
| TP165 | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP166 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP167 | 0 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP168 | 0.7 | 06/03/2008 | | | | | | | | | | | | | | ND | | | |
| TP171 | 0.1 | 16/01/2009 | ND | ND | ND | 2.1 | 1.5 | 2 | ND | ND | 1.9 | ND | 3 | ND | ND | ND | ND | 2.7 | NPT acceptance granted to leave in-situ |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP172 | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP173 | 1.4 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP174 | 0.1 | 02/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP175 | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP176 | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP177 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP178 | 0.7 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.9 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP179 | 1.4 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP182 | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP183 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP184 | 2.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP185 | 2.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP186 | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP187 | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP188 | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP189 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP190 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP191 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP192 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP193 | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP196 | 2.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP197 | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP198 | 1.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP199 | 1.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP200 | 1.4 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP201 | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP202 | 1.3 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP203 | 0.2 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP204 | 0.85 | 06/03/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP206 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP207 | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | | 03/12/2008 | | | | 1.6 | 1.3 | 1.6 | | | 1.4 | | 1.9 | | | | 1.1 | 1.7 | Excavated, resampled and passed 29/6/09 |
| | 0.1 | 20/05/2009 | 1.4 | | 1.3 | 9.8 | 13 | 19 | 12 | 6.5 | 13 | 3.5 | 15 | | 13 | | 7.7 | 13 | Excavated, resampled and passed 29/6/09 |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP208 | 2.2 | 29/06/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP209 | 2.8 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP210 | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.4 | ND | ND | ND | 1.5 | 1.1 | |
| TP211 | 2.8 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP212 | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP213 | 2.1 | 10/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |

ND - note detected above the method detection limit

**Table 3d - Polycyclic Aromatic Hydrocarbon (PAH) Concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | PAH |
|---|---|

| RBSL (mg/kg) | | | | | | | 0.9 | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | BENZO_A_ANTHRACENE | BENZO_A_PYRENE | BENZO_B_FLUORANTHENE | BENZO_G_H_I_PERYLENE | BENZO_K_FLUORANTHENE | CHRYSENE | DIBENZ_A_H_ANTHRACENE | FLUORANTHENE | FLUORENE | INDENO_1_2_3_CD_PYRENE | NAPHTHALENE | PHENANTHRENE | PYRENE | Comment where RBSL exceeded |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP214 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP215 | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP216 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | 2.1 | 1.3 | 1.6 | ND | ND | 1.6 | ND | 3.2 | ND | ND | ND | ND | 2.6 | NPT acceptance granted to leave in-situ |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP218 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP219 | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP220 | 2.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP221 | 2.1 | 03/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP222 | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.3 | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP225 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP226 | 2.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP227 | 2.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP228 | 0.7 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP229 | 2.8 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP230 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP231 | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP232 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP233 | 2.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP234 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP235 | 2.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP236 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP237 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP238 | 1.4 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP239 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP240 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP241 | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP242 | 1.4 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP243 | 0.1 | 16/01/2009 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP244 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP245 | 2.1 | 04/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP246 | 2.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP247 | 0.7 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP248 | 0.1 | 05/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP249 | 0.1 | 08/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |
| TP250 | 0.1 | 09/12/2008 | ND | ND | ND | ND | 1.2 | 1.7 | ND | ND | ND | ND | 1.6 | ND | ND | ND | ND | 1.3 | NPT acceptance granted to leave in-situ |
| TP251 | 0.1 | 09/12/2008 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | |

ND - note detected above the method detection limit

**Table 3e - Asbestos concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Asbestos |
|---|---|

| RBSL (mg/kg) | | | | | | 200 |
|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | Amosite | Chrysotile | Crocidolite | Total Asbestos |
| CE01N | 0.5 | 05/12/2008 | ND | ND | ND | ND |
| CE01S | 0.5 | 05/12/2008 | ND | ND | ND | ND |
| CE02N | 1.5 | 05/12/2008 | ND | ND | ND | ND |
| CE02S | 1.5 | 05/12/2008 | ND | ND | ND | ND |
| CE03 | 1 | 09/12/2008 | ND | ND | ND | ND |
| CE04 | 1.5 | 09/12/2008 | ND | Fibre | ND | ND |
| CE05 | 1 | 09/12/2008 | ND | ND | ND | ND |
| CE06B | 1.5 | 09/12/2008 | ND | ND | ND | ND |
| CE06N | 1 | 09/12/2008 | ND | ND | ND | ND |
| CE06S | 1 | 09/12/2008 | ND | ND | ND | ND |
| CE07 | 1 | 09/12/2008 | ND | ND | ND | ND |
| CE08 | 1 | 09/12/2008 | ND | ND | ND | ND |
| CE09 | 1.5 | 09/12/2008 | ND | ND | ND | ND |
| CE10 | 1 | 09/12/2008 | ND | ND | ND | ND |
| | 0.1 | 05/03/2008 | ND | ND | ND | ND |
| TP001 | 0.7 | 05/03/2008 | ND | ND | ND | ND |
| | 0.1 | 05/03/2008 | ND | ND | ND | ND |
| TP004 | 0.8 | 05/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP006 | 0.5 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP007 | 1 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP008 | 0.5 | 07/03/2008 | ND | ND | ND | ND |
| TP009 | 0.45 | 05/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP011 | 0.6 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP012 | 0.5 | 07/03/2008 | ND | ND | ND | ND |
| TP013 | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP014 | 0 | 02/04/2008 | ND | ND | ND | ND |
| TP018 | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP019 | 0.4 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP020 | 0.75 | 07/03/2008 | ND | ND | ND | ND |
| TP021 | 0.05 | 02/04/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP022 | 0.5 | 07/03/2008 | ND | ND | ND | ND |
| TP023 | 0.75 | 05/03/2008 | ND | ND | ND | ND |
| TP025 | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP026 | 0.5 | 07/03/2008 | ND | ND | ND | ND |
| TP030 | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| | 0.2 | 07/03/2008 | ND | ND | ND | ND |
| TP031 | 0.9 | 07/03/2008 | ND | ND | ND | ND |
| | 0.1 | 05/03/2008 | ND | ND | ND | ND |
| TP035 | 0.9 | 05/03/2008 | ND | ND | ND | ND |
| | 0.1 | 05/03/2008 | ND | ND | ND | ND |
| TP041 | 0.8 | 05/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP042 | 0.55 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP043 | 0.95 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP044 | 0.8 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP045 | 0.6 | 07/03/2008 | ND | ND | ND | ND |
| TP046 | 0 | 02/04/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| | 1.3 | 07/03/2008 | ND | ND | ND | ND |
| TP049 | 1.7 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP055 | 2 | 07/03/2008 | ND | ND | ND | ND |
| | 0.2 | 07/03/2008 | ND | ND | ND | ND |
| TP063 | 0.85 | 07/03/2008 | ND | ND | ND | ND |
| TP064 | 0 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP071 | 1.2 | 07/03/2008 | ND | ND | ND | ND |
| TP082 | 0 | 07/03/2008 | ND | ND | ND | ND |
| TP091 | 0.2 | 07/03/2008 | ND | ND | ND | ND |
| TP092 | 0 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP102 | 0.7 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP112 | 0.65 | 07/03/2008 | ND | ND | ND | ND |
| TP113 | 0 | 07/03/2008 | ND | ND | ND | ND |
| TP114 | 0 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP123 | 0.95 | 07/03/2008 | ND | ND | ND | ND |
| TP124 | 0 | 07/03/2008 | ND | ND | ND | ND |

ND - not detected above the method detection limit

**Table 3e - Asbestos concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Asbestos |
|---|---|

| RBSL (mg/kg) | | | | | | 200 |
|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | Amosite | Chrysotile | Crocidolite | Total Asbestos |
| TP125 | 0 | 07/03/2008 | ND | ND | ND | ND |
| | 0.2 | 10/03/2008 | ND | ND | ND | ND |
| TP126 | 0.85 | 10/03/2008 | ND | ND | ND | ND |
| TP135 | 0 | 07/03/2008 | ND | ND | ND | ND |
| TP136 | 0.2 | 07/03/2008 | ND | ND | ND | ND |
| | 0.15 | 10/03/2008 | ND | ND | ND | ND |
| TP137 | 0.85 | 10/03/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP145 | 0.85 | 07/03/2008 | ND | ND | ND | ND |
| TP146 | 0 | 07/03/2008 | ND | ND | ND | ND |
| TP147 | 0 | 07/03/2008 | ND | ND | ND | ND |
| TP156 | 0 | 07/03/2008 | ND | ND | ND | ND |
| TP157 | 0.2 | 07/03/2008 | ND | ND | ND | ND |
| TP166 | 0.15 | 10/03/2008 | ND | ND | ND | ND |
| TP167 | 0 | 07/03/2008 | ND | ND | ND | ND |
| TP171 | 0.2 | 10/04/2008 | ND | ND | ND | ND |
| TP177 | 0.15 | 10/03/2008 | ND | ND | ND | ND |
| | 0.15 | 10/03/2008 | ND | ND | ND | ND |
| TP178 | 0.7 | 10/03/2008 | ND | ND | ND | ND |
| | 0.15 | 10/03/2008 | ND | ND | ND | ND |
| | 0.9 | 10/03/2008 | ND | ND | ND | ND |
| TP179 | 1.4 | 10/03/2008 | ND | ND | ND | ND |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND |
| | 1 | 09/04/2008 | ND | ND | ND | ND |
| TP180 | 1.3 | 09/04/2008 | ND | ND | ND | ND |
| | 0.15 | 09/04/2008 | ND | ND | ND | ND |
| | 0.8 | 09/04/2008 | ND | ND | ND | ND |
| TP182 | 1.1 | 09/04/2008 | ND | ND | ND | ND |
| TP183 | 0.7 | 10/03/2008 | ND | ND | ND | ND |
| TP190 | 0.15 | 10/03/2008 | ND | ND | ND | ND |
| TP191 | 0.15 | 10/03/2008 | ND | ND | ND | ND |
| TP192 | 0.2 | 10/03/2008 | ND | ND | ND | ND |
| TP193 | 0.15 | 10/03/2008 | ND | ND | ND | ND |
| | 0.15 | 10/03/2008 | ND | ND | ND | ND |
| TP202 | 1.3 | 10/03/2008 | ND | ND | ND | ND |
| TP203 | 0.2 | 10/03/2008 | ND | ND | ND | ND |
| | 0.15 | 10/03/2008 | ND | ND | ND | ND |
| TP204 | 0.85 | 10/03/2008 | ND | ND | ND | ND |
| | 0.3 | 09/04/2008 | ND | ND | ND | ND |
| TP205 | 1.1 | 09/04/2008 | ND | ND | ND | ND |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND |
| | 1.1 | 09/04/2008 | ND | ND | ND | ND |
| TP206 | 1.4 | 09/04/2008 | ND | ND | ND | ND |
| TP207 | 0.2 | 09/04/2008 | ND | ND | ND | ND |
| | 0.3 | 09/04/2008 | ND | ND | ND | ND |
| | 0.8 | 09/04/2008 | ND | ND | ND | ND |
| TP217 | 1.1 | 09/04/2008 | ND | ND | ND | ND |
| | 0.3 | 09/04/2008 | ND | ND | ND | ND |
| | 1 | 09/04/2008 | ND | ND | ND | ND |
| TP218 | 1.6 | 09/04/2008 | ND | ND | ND | ND |
| | 0.15 | 09/04/2008 | ND | ND | ND | ND |
| TP219 | 1.1 | 09/04/2008 | ND | ND | ND | ND |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND |
| TP230 | 1.2 | 09/04/2008 | ND | ND | ND | ND |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND |
| TP236 | 0.9 | 09/04/2008 | ND | ND | ND | ND |
| | 0.2 | 10/04/2008 | ND | ND | ND | ND |
| | 1 | 10/04/2008 | ND | ND | ND | ND |
| | 1.7 | 10/04/2008 | ND | ND | ND | ND |
| TP242 | 2.1 | 10/04/2008 | ND | ND | ND | ND |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND |
| | 1.2 | 09/04/2008 | ND | ND | ND | ND |
| | 1.7 | 09/04/2008 | ND | ND | ND | ND |
| TP243 | 2.4 | 09/04/2008 | ND | ND | ND | ND |
| TP244 | 0.8 | 09/04/2008 | ND | ND | ND | ND |
| | 0.2 | 10/04/2008 | ND | ND | ND | ND |
| TP247 | 0.9 | 10/04/2008 | ND | ND | ND | ND |
| | 0.2 | 09/04/2008 | ND | ND | ND | ND |
| TP248 | 1.3 | 09/04/2008 | ND | ND | ND | ND |
| | 0.3 | 10/04/2008 | ND | ND | ND | ND |
| | 1 | 10/04/2008 | ND | ND | ND | ND |
| TP249 | 1.7 | 10/04/2008 | ND | ND | ND | ND |
| | 0.2 | 10/04/2008 | ND | ND | ND | ND |
| TP252 | 0.9 | 10/04/2008 | ND | ND | ND | ND |
| MS189 | 1.5 | 10/12/2008 | ND | ND | ND | ND |
| TP002 | 0.1 | 20/05/2009 | ND | ND | ND | ND |
| | 0.1 | 20/05/2009 | ND | ND | ND | ND |
| TP003 | 0.7 | 20/05/2009 | ND | ND | ND | ND |
| TP004 | 0.9 | 06/03/2008 | ND | ND | ND | ND |
| TP009 | 0.1 | 06/03/2008 | ND | ND | ND | ND |
| | 0.1 | 06/03/2008 | ND | ND | ND | ND |

ND - not detected above the method detection limit

**Table 3e - Asbestos concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Asbestos |
|---|---|

| RBSL (mg/kg) | | | | | | 200 |
|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | Amosite | Chrysotile | Crocidolite | Total Asbestos |
| | 0.8 | 06/03/2008 | ND | ND | ND | ND |
| TP010 | 1.4 | 06/03/2008 | ND | ND | ND | ND |
| | 0.1 | 06/03/2008 | ND | ND | ND | ND |
| TP015 | 0.5 | 06/03/2008 | ND | ND | ND | ND |
| TP017 | 0.1 | 20/05/2009 | ND | ND | ND | ND |
| TP023 | 0.1 | 06/03/2008 | ND | ND | ND | ND |
| TP024 | 0.1 | 20/05/2009 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP027 | 0.8 | 06/03/2008 | ND | ND | ND | ND |
| | 0.1 | 06/03/2008 | ND | ND | ND | ND |
| TP028 | 0.9 | 06/03/2008 | ND | ND | ND | ND |
| TP029 | 0.1 | 20/05/2009 | ND | ND | ND | ND |
| TP032 | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP033 | 1.4 | 06/03/2008 | ND | ND | ND | ND |
| | 0.1 | 06/03/2008 | ND | ND | ND | ND |
| TP034 | 1 | 06/03/2008 | ND | ND | ND | ND |
| TP036 | 0.1 | 10/12/2008 | ND | ND | ND | ND |
| TP037 | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP038 | 0.9 | 06/03/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP039 | 0.85 | 06/03/2008 | ND | ND | ND | ND |
| TP040 | 0.05 | 06/03/2008 | ND | ND | ND | ND |
| TP042 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP047 | 0.1 | 16/01/2009 | ND | ND | ND | ND |
| TP048 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP050 | 0.9 | 06/03/2008 | ND | ND | ND | ND |
| TP051 | 0.1 | 06/03/2008 | ND | ND | ND | ND |
| | 0.1 | 06/03/2008 | ND | ND | ND | ND |
| TP052 | 1.4 | 06/03/2008 | ND | ND | ND | ND |
| TP053 | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| TP054 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP056 | 1 | 06/03/2008 | ND | ND | ND | ND |
| TP057 | 0 | 06/03/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP058 | 1 | 06/03/2008 | ND | ND | ND | ND |
| TP059 | 0.1 | 06/03/2008 | ND | Fibre | ND | ND |
| TP060 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP061 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP062 | 0.7 | 01/12/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP065 | 0.65 | 06/03/2008 | ND | ND | ND | ND |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP068 | 0.5 | 01/12/2008 | ND | ND | ND | ND |
| TP069 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP070 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| | 0.15 | 07/03/2008 | ND | ND | ND | ND |
| TP072 | 0.55 | 07/03/2008 | ND | ND | ND | ND |
| TP073 | 0 | 10/03/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP074 | 0.95 | 06/03/2008 | ND | ND | ND | ND |
| TP077 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP078 | 0.7 | 01/12/2008 | ND | ND | ND | ND |
| TP079 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND |
| TP080 | 1.2 | 01/12/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP081 | 1.1 | 06/03/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP083 | 0.5 | 06/03/2008 | ND | ND | ND | ND |
| TP084 | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP087 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP088 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP089 | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| | 0.7 | 01/12/2008 | ND | ND | ND | ND |
| TP090 | 1.2 | 01/12/2008 | ND | ND | ND | ND |
| TP093 | 0 | 10/03/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP094 | 0.6 | 06/03/2008 | ND | ND | ND | ND |
| TP098 | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| TP099 | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP100 | 0.7 | 01/12/2008 | ND | ND | ND | ND |
| TP101 | 0.1 | 10/12/2008 | ND | ND | ND | ND |

ND - not detected above the method detection limit

**Table 3e - Asbestos concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Asbestos |
|---|---|

| RBSL (mg/kg) | | | | | | 200 |
|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | Amosite | Chrysotile | Crocidolite | Total Asbestos |
| TP103 | 0 | 10/03/2008 | ND | ND | ND | ND |
| | 0.15 | 06/03/2008 | ND | ND | ND | ND |
| TP104 | 0.8 | 06/03/2008 | ND | ND | ND | ND |
| TP107 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP108 | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| TP109 | 0.1 | 16/01/2009 | ND | ND | ND | ND |
| | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| | 0.7 | 02/12/2008 | ND | ND | ND | ND |
| TP110 | 1.4 | 02/12/2008 | ND | ND | ND | ND |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND |
| TP111 | 1.4 | 10/12/2008 | ND | ND | ND | ND |
| TP119 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP120 | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| TP121 | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| TP122 | 0.1 | 10/12/2008 | ND | ND | ND | ND |
| TP130 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| TP131 | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| TP132 | 0.7 | 02/12/2008 | ND | ND | ND | ND |
| | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| | 0.7 | 02/12/2008 | ND | ND | ND | ND |
| TP133 | 1.5 | 02/12/2008 | ND | ND | ND | ND |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND |
| TP134 | 1.4 | 09/12/2008 | ND | ND | ND | ND |
| TP141 | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| TP142 | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND |
| TP143 | 1.4 | 10/12/2008 | ND | ND | ND | ND |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND |
| | 1.4 | 09/12/2008 | ND | ND | ND | ND |
| TP144 | 2.1 | 09/12/2008 | ND | ND | ND | ND |
| TP151 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| TP152 | 0.7 | 03/12/2008 | ND | ND | ND | ND |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND |
| TP153 | 1.4 | 10/12/2008 | ND | ND | ND | ND |
| TP154 | 0.1 | 09/12/2008 | ND | 0.18 | ND | 0.18 |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| TP155 | 0.7 | 09/12/2008 | ND | ND | ND | ND |
| TP158 | 0 | 10/03/2008 | ND | ND | ND | ND |
| TP162 | 0.1 | 01/12/2008 | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND |
| TP163 | 1.4 | 05/12/2008 | ND | ND | ND | ND |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND |
| TP164 | 1.4 | 10/12/2008 | ND | ND | ND | ND |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| TP165 | 0.7 | 09/12/2008 | ND | ND | ND | ND |
| TP171 | 0.1 | 16/01/2009 | ND | ND | ND | ND |
| TP172 | 0.1 | 16/01/2009 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND |
| TP173 | 1.4 | 03/12/2008 | ND | ND | ND | ND |
| TP174 | 0.1 | 02/12/2008 | ND | ND | ND | ND |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND |
| TP175 | 0.7 | 10/12/2008 | ND | ND | ND | ND |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND |
| TP176 | 0.7 | 10/12/2008 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| TP182 | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND |
| TP183 | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| TP184 | 2.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| TP185 | 2.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| TP186 | 0.7 | 03/12/2008 | ND | ND | ND | ND |

ND - not detected above the method detection limit

**Table 3e - Asbestos concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Asbestos |
|---|---|

| RBSL (mg/kg) | | | | | | 200 |
|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | Amosite | Chrysotile | Crocidolite | Total Asbestos |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| TP187 | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND |
| TP188 | 0.7 | 05/12/2008 | ND | ND | ND | ND |
| TP189 | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND |
| TP196 | 2.1 | 03/12/2008 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| TP197 | 0.7 | 03/12/2008 | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND |
| TP198 | 1.4 | 05/12/2008 | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND |
| TP199 | 1.4 | 05/12/2008 | ND | ND | ND | ND |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND |
| TP200 | 1.4 | 09/12/2008 | ND | ND | ND | ND |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND |
| TP201 | 0.7 | 10/12/2008 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| TP206 | 1.4 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| TP207 | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND |
| TP208 | 2.1 | 03/12/2008 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND |
| | 2.1 | 03/12/2008 | ND | ND | ND | ND |
| TP209 | 2.8 | 03/12/2008 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| TP210 | 0.7 | 03/12/2008 | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND |
| | 1.4 | 05/12/2008 | ND | ND | ND | ND |
| | 2.1 | 05/12/2008 | ND | ND | ND | ND |
| TP211 | 2.8 | 05/12/2008 | ND | ND | ND | ND |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| TP212 | 0.7 | 09/12/2008 | ND | ND | ND | ND |
| | 0.1 | 10/12/2008 | ND | ND | ND | ND |
| | 0.7 | 10/12/2008 | ND | ND | ND | ND |
| | 1.4 | 10/12/2008 | ND | ND | ND | ND |
| TP213 | 2.1 | 10/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| TP214 | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| TP215 | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| TP216 | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | Fibre | ND | ND | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| TP218 | 1.4 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| TP219 | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND |
| TP220 | 2.1 | 03/12/2008 | ND | ND | ND | ND |
| | 0.1 | 03/12/2008 | ND | ND | ND | ND |
| | 0.7 | 03/12/2008 | ND | ND | ND | ND |
| | 1.4 | 03/12/2008 | ND | ND | ND | ND |
| TP221 | 2.1 | 03/12/2008 | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND |
| TP222 | 0.7 | 05/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| TP225 | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| TP226 | 2.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| TP227 | 2.1 | 04/12/2008 | ND | ND | ND | ND |

ND - not detected above the method detection limit

**Table 3e - Asbestos concentrations in Validation Soil Samples (mg/kg)**

| Chem Class | Asbestos |
|---|---|

| RBSL (mg/kg) | | | | | | 200 |
|---|---|---|---|---|---|---|
| Location | Depth | Sample_Date | Amosite | Chrysotile | Crocidolite | Total Asbestos |
| | 0.1 | 16/01/2009 | ND | ND | ND | ND |
| TP228 | 0.7 | 16/01/2009 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND |
| | 2.1 | 08/12/2008 | ND | ND | ND | ND |
| TP229 | 2.8 | 08/12/2008 | ND | ND | ND | ND |
| TP230 | 0.1 | 05/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| TP231 | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| TP232 | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| TP233 | 2.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| TP234 | 1.4 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| | 1.4 | 08/12/2008 | ND | ND | ND | ND |
| TP235 | 2.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| TP236 | 1.4 | 08/12/2008 | ND | ND | ND | ND |
| TP237 | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.7 | 08/12/2008 | ND | ND | ND | ND |
| TP238 | 1.4 | 08/12/2008 | ND | ND | ND | ND |
| TP239 | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| TP240 | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| TP241 | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND |
| | 0.7 | 05/12/2008 | ND | ND | ND | ND |
| TP242 | 1.4 | 05/12/2008 | ND | ND | ND | ND |
| TP243 | 0.1 | 16/01/2009 | ND | ND | ND | ND |
| TP244 | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| | 0.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.7 | 04/12/2008 | ND | ND | ND | ND |
| | 1.4 | 04/12/2008 | ND | ND | ND | ND |
| TP245 | 2.1 | 04/12/2008 | ND | ND | ND | ND |
| | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| | 0.7 | 09/12/2008 | ND | ND | ND | ND |
| | 1.4 | 09/12/2008 | ND | ND | ND | ND |
| TP246 | 2.1 | 09/12/2008 | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND |
| TP247 | 0.7 | 05/12/2008 | ND | ND | ND | ND |
| | 0.1 | 05/12/2008 | ND | ND | ND | ND |
| TP248 | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| TP249 | 0.1 | 08/12/2008 | ND | ND | ND | ND |
| TP250 | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| TP251 | 0.1 | 09/12/2008 | ND | ND | ND | ND |
| TP252 | 0.1 | 08/12/2008 | ND | ND | ND | ND |

ND - not detected above the method detection limit

**TABLE 4**
**Summary of Trial Pits Undertaken on 6 June 2007 to Assess Solvent Odours in Area C of Area 1**

**Trial Pit reference: TP_CD1**

In area where hydrocarbon/solvent odour previously noted in rock on 23 March 2007 when chasing bottom ash horizon

| Depth (m bgl) | Geology | Observations | PID reading (ppm) | | Sample | Sample ref | Analysis |
|---|---|---|---|---|---|---|---|
| | | | 10.6eV lamp | 11.7eV lamp | | | |
| 0-0.5m | MG: Firm brown and orange clay with much rounded to subangular fine to coarse gravel. | Slightly damp, NVO | 0.7 | 0.1 | No | - | - |
| 0.5-1.0m | Weakly laminated SANDSTONE | Dry, NVO | 0.0 | 0.0 | No | - | - |

Terminated at 1.0m bgl on hard grey sandstone
Granular/ash in location of TPC1 had previously been excavated

**Trial Pit reference: TP_CD2**

Due to presence of bedrock in TPCD1, trial pit location was moved approx 10m down topographic gradient such that TPCD2 was just beyond postion of trial pit where odour was noted on 23 March 2007

| Depth (m bgl) | Geology | Observations | PID reading (ppm) | | Sample | Sample ref | Analysis | Total TPH (mg/kg) | VOCs |
|---|---|---|---|---|---|---|---|---|---|
| | | | 10.6eV lamp | 11.7eV lamp | | | | | |
| 0-0.9m | MG: Firm brown and orange clay with much rounded to subangular fine to coarse gravel. | NVO | 0.0 | 0.6 | No | - | - | - | - |
| 0.9-2.5m | Grey silty CLAY and weakly laminated SANDSTONE | * | 193 | 167 | Soil | CP_RE18_1.6-1.8m | VOCs & TPH | 83 | <0.01mg/kg |
| | | | | | Water | CP_RE22_1.7m | VOCs | not tested | <1µg/l |

Terminated at 2.5m bgl on hard grey sandstone
Granular/ash in location of TPC1 had previously been excavated
*Groundwater seepage from northern face at 1.7/1.8m. Slight sheen.

**Trial Pit reference: TP_CD3**

| Depth (m bgl) | Geology | Observations | PID reading (ppm) | | Sample | Sample ref | Analysis | Total TPH (mg/kg) | VOCs |
|---|---|---|---|---|---|---|---|---|---|
| | | | 10.6eV lamp | 11.7eV lamp | | | | | |
| 0-0.2m | MG: Black-brown sandy fine gravel with much ash | NVO | 0.1 | 0 | No | - | | - | - |
| 0.2-0.5m | MG: Yellow fine sand | Damp, ** | 2.3 | 2.4 | Soil | CP_RE19_0.3-0.5m | VOCs & TPH | 64 | <0.01mg/kg |
| 0.5-0.7m | MG: Black ash (more 'carbonised' than typical ash on Area 1) | Dry | 322 | 232 | Soil | CP_RE20_0.6-0.7m | VOCs & TPH | 1500 | <0.01mg/kg |
| 0.7-1.1m | Grey silty CLAY with much angular gravel | Dry | 5.3 | 5.4 | Soil | CP_RE21_0.9-1.1 | VOCs & TPH | 770 | <0.01mg/kg |
| 1.1-1.8m | Grey silty CLAY and weakly laminated SANDSTONE | *** | 246 | 162 | Water | CP_RE23_1.7m | VOCs | not tested | several**** |
| 1.8-2.2m | Hard grey tabular SANDSTONE. | Wet | 316 | 584 | | | | | |

** Strong solvent/hydrocarbon odour noted upwind (operator breathing zone <10ppm).
*** Groundwater seepage from northern and southern faces at 1.8m bgl. Small dispersed globules of dark brown free phase floating hydrocarbon observed.
****VOCs detected above method reporting limit of 1µg/l include chloroethane 4.9µg/l; isopropylbenzene 4.7µg/l; n-propylbenzene 4.8µg/l; sec-butylbenzene 21.2 µg/l

**KEY**

| | |
|---|---|
| MG | Made Ground |
| m bgl | metres below ground level - depth below surface at time of trial pit |
| NVO | No visual indicators of contamination (wearing respirator, hence no olfactory observations) |
| - | sample not collected |

**TABLE 5**
**Summary of Trial Pits Undertaken on 1 February 2008 to Assess Solvent Odours in Areas C, D and G of Area 1**

| Trial Pit Location | | | | Geology | Additional Observations | PID Readings | | Aesthetic Ratings | |
|---|---|---|---|---|---|---|---|---|---|
| Reference | Easting | Northing | Depth (mbgl) | | | Headspace (ppm) | OBZ (ppm) | Visual | Olfactory |
| TP1 | 271665 | 195592 | 0.5 | Loose medium brown silty gravelly SAND | Dry-damp | 11.5 | 0.2 | 0 | 2 |
| | | | 1.3 | Medium firm grey silty gravelly CLAY with increasing tabular cobbles and veins of darker grey | Dry | 112 | 0.7 | 0 | 2 or 3 |
| | | | 1.8 | As above clay with weathered SANDSTONE | Dry | 145 | 0.5 | 0 or 1 | 2 or 3 |
| | | | 1.8 | Terminated due to bedrock | | | | | |
| TP2 | 271686 | 195611 | 0.5 | Light to medium brown orange gravelly SAND | Dry | 0.1 | 0 | 0 | 0 |
| | | | 1.3 | Weathered SANDSTONE | Dry | 0.1 | 0 | 0 | 0 |
| | | | 1.6 | Terminated due to bedrock | | | | | |
| TP3 | 271702 | 195627 | 0.5 | Light to medium brown orange very gravelly slightly clayey SAND | Dry | 0 | 0 | 0 | 0 |
| | | | 0.8 | Terminated due to bedrock | | | | | |
| TP4 | 271715 | 195609 | 0.1 | Weathered SANDSTONE | Dry | 0 | 0 | 0 | 0 |
| | | | 0.1 | Terminated due to bedrock | | | | | |
| TP5 | 271697 | 195594 | 0.4 | Medium brown grey gravelly clayey SAND with cobbles and boulders of SANDSTONE | Dry | 0 | 0 | 0 | 0 |
| | | | 0.4 | Terminated due to bedrock | | | | | |
| TP6 | 271678 | 195577 | 0.5 | Medium brown grey gravelly clayey SAND with cobbles and boulders of SANDSTONE | Dry | 0 | 0 | 0 | 0 |
| | | | 1 | Grey gravelly CLAY with weathered bedrock at base | Dry | 0 | 0 | 0 | 0 |
| | | | 1 | Terminated due to bedrock | | | | | |
| TP7 | 271673 | 195586 | 0.5 | Medium brown slightly clayey gravelly SAND | Dry-damp | 0 | 0 | 0 | 0 |
| | | | 0.9 | Terminated due to bedrock | | | | | |
| TP8 | 271668 | 195590 | 0.5 | Medium brown slightly clayey gravelly SAND | Dry | 0 | 0 | 0 | 0 |
| | | | 0.9 | Terminated due to bedrock | | | | | |
| TP9 | 271659 | 195588 | 0.5 | Medium brown slightly clayey gravelly SAND | Dry | 0 | 0 | 0 | 0 |
| | | | 0.8 | Terminated due to bedrock | | | | | |
| TP10 | 271661 | 195595 | 0.5 | Light to medium brown orange very silty gravelly SAND with cobbles | Damp | 146 | 0.2 | 1 | 2 |
| | | | 1 | Grey gravelly CLAY with weathered bedrock at base | Damp | 127 | 0.1 | 1 | 2 |
| | | | 1 | Terminated due to bedrock | | | | | |
| TP11 | 271655 | 195592 | 0.5 | Light to medium brown orange clayey gravelly SAND | Damp | 77 | 0.5 | 0 | 2 |
| | | | 1 | Medium brown grey sandy gravelly CLAY | Damp | 4.1 | 1.1 | 0 | 2 |
| | | | 1.5 | As above with darker grey/black staining | Damp | 161 | 1.6 | 1 | 2 or 3 |
| | | | 1.5 | Terminated due to bedrock | | | | | |
| TP12 | 271652 | 195589 | 0.5 | Brown grey clayer gravelly SAND | Wet | 163 | 8.9 | 2 | 3 |
| | | | 2 | Brown grey sandy gravelly CLAY (recovered as slurry) | Very wet, sheen on water | 184 | 2.4 | 3 | 3 |
| | | | 2 | Terminated due to water ingress (approx. 1mbgl), not yet reached bedrock | | | | | |
| TP13 | 271649 | 195586 | 0.8 | Light to medium brown clayey gravelly SAND | Damp, ambient odours from TP12 | 1 | 0.8 | 0 | 0 |
| | | | 1.3 | Grey gravelly CLAY with weathered bedrock at base | Damp-wet, ambient odours from TP12, no sheen on water | 0.9 | 0.7 | 0 | 0 |
| | | | 1.3 | Terminated due to bedrock and slow water ingress from 0.8 m | | | | | |
| TP14 | 271655 | 195585 | 0.5 | Medium to light brown slightly clayey gravelly SAND | Damp, ambient odours from TP12 | 0.5 | 0.7 | 0 | 0 |
| | | | 0.7 | Terminated due to bedrock | | | | | |
| TP15 | 271649 | 195592 | 0.8 | Soft medium brown slightly clayey gravelly SAND | Damp | 164 | 1.9 | 1 or 2 | 3 |
| | | | 2 | Grey gravelly sandy CLAY | Wet, no sheen on water | 98.2 | 3.4 | 1 | 3 |
| | | | 2 | Terminated due to water ingress(approx 1.5mbgl), not yet reached bedrock | | | | | |
| TP16 | 271667 | 195598 | 0.5 | Light to medium brown orange very silty gravelly SAND with cobbles | Dry | 41.8 | 1 | 0 | 1 |
| | | | 1.1 | Grey gravelly CLAY with weathered bedrock at base | Dry | 115 | 115 | 1 | 2 |
| | | | 1.1 | Terminated due to bedrock | | | | | |

Key:
mbgl - metres below ground level
PID - Photo-ionisation Detector
OBZ = PID reading taken in Operator's Breathing Zone

Aesthetic Ratings:

| Rating | Visual | Olfactory |
|---|---|---|
| 0 | No Staining | No Odour |
| 1 | Occasional Discolouration | Faint Odour |
| 2 | Frequent Discolouration | Distinct but not strong |
| 3 | Small amounts of heavy | Strong odour |
| 4 | Heavy black staining | Strong odour |
| 5 | Visible product | Overwhelming Odour |

**TABLE 6a**

**Metals Concentrations in Stockpiles Derived from Earthworks to Assess Re-use on Area 1 (mg/kg)**

| fk_location | Depth (m) | ARSENIC | CADMIUM | CHROMIUM | COPPER | LEAD | MERCURY | NICKEL | SELENIUM | VANADIUM | ZINC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **RBSL** | | 64 | 3.6 | 130 | 478 | 337 | 1 | 50 | 3 | 416 | 3280 |
| **SPCE01** | 1 | 56 | 1.1 | 14 | 140 | 94 | 0.28 | 21 | 0.68 | 24 | 160 |
| **SPCE01D** | 2 | 41 | 1.1 | 15 | 100 | 65 | -1 | 23 | 0.61 | 23 | 160 |
| **SPCE02** | 1 | 38 | 0.87 | 32 | 100 | 86 | 0.25 | 20 | 0.57 | 39 | 180 |
| **SPCE02D** | 2 | 43 | 1.2 | 15 | 130 | 58 | -1 | 22 | 0.67 | 22 | 130 |
| **SPCE03** | 1 | 45 | 1.1 | 15 | 120 | 76 | -1 | 22 | 0.67 | 24 | 150 |
| **SPCE03D** | 2 | 36 | 0.96 | 14 | 110 | 52 | -1 | 27 | 0.61 | 21 | 140 |
| **SPCE04** | 1 | 10 | -1 | 14 | 28 | 25 | -1 | 30 | 0.45 | 18 | 100 |
| **SPCE05** | 1 | 7.9 | -1 | 16 | 23 | 24 | -1 | 32 | -1 | 18 | 94 |
| **SPCE06** | 1 | 7 | -1 | 13 | 15 | 16 | -1 | 28 | 0.37 | 16 | 75 |
| **SPCE07** | 1 | 14 | -1 | 27 | 51 | 48 | -1 | 41 | 0.32 | 22 | 140 |
| **SPCE08** | 1 | 13 | -1 | 16 | 39 | 50 | 0.3 | 37 | -1 | 22 | 120 |
| **SPCE09** | 1 | 18 | 0.57 | 17 | 55 | 120 | 0.29 | 26 | 0.43 | 19 | 200 |
| **SPCE10** | 1 | 12 | 0.69 | 16 | 34 | 190 | -1 | 19 | -1 | 14 | 310 |
| **SPCE11** | 1 | 14 | -1 | 17 | 96 | 47 | 0.34 | 73 | 0.45 | 22 | 130 |
| **SPCE12** | 1 | 5 | -1 | 20 | 46 | 42 | -1 | 50 | -1 | 28 | 130 |
| **SPCE13** | 1 | 5.2 | -1 | 19 | 50 | 54 | -1 | 57 | 0.3 | 25 | 140 |
| **SPCE14** | 1 | 5.3 | -1 | 17 | 27 | 21 | -1 | 45 | -1 | 20 | 100 |
| **SPCE15** | 1 | 5.3 | -1 | 16 | 16 | 16 | -1 | 50 | -1 | 18 | 80 |

N.B Due to exceedance of the RBSL for nickel, materials represented by stockpiles SPCE11 and SPCE13 were not re-used on Area 1 but sent to top terrace.

ND - not detected above the method detection limit

**TABLE 6b**

**Polycyclic Aromatic Hydrocarbon (PAH) Concentrations in Stockpiles Derived from Earthworks to Assess Re-use on Area 1 (mg/kg)**

| fk_location | Depth (m) | BENZO_A_PYRENE | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | BENZO_A_ANTHRACENE | BENZO_B_FLUORANTHENE | BENZO_G_H_I_PERYLENE | BENZO_K_FLUORANTHENE | CHRYSENE | DIBENZ_A_H_ANTHRACENE | FLUORANTHENE | FLUORENE | INDENO_1_2_3_CD_PYRENE | NAPHTHALENE | PHENANTHRENE | PYRENE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **RBSL** | | 0.9 | | | | | | | | | | | | | | | |
| **SPCE01** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE01D** | 2 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE02** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE02D** | 2 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE03** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE03D** | 2 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE04** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE05** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE06** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE07** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE08** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE09** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE10** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 1.2 | *ND* | *ND* | *ND* | *ND* | 1.2 |
| **SPCE11** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE12** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE13** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE14** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE15** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |

N.B Due to exceedance of the RBSL for nickel, materials represented by stockpiles SPCE11 and SPCE13 were not re-used on Area 1 but sent to top terrace.

ND - not detected above the method detection limit

**TABLE 6c**

**Total Petroleum Hydrocarbon (TPH) Concentrations in Stockpiles Derived from Earthworks to Assess Re-use on Area 1 (mg/kg)**

| fk_location | Depth (m) | RISK_TPH_C6_C8_ALI | RISK_TPH_C8_C10_ALI | RISK_TPH_C10_C12_ALI | RISK_TPH_C12_C16_ALI | RISK_TPH_C16_C21_ALI | RISK_TPH_C21_C40_ALI | RISK_TPH_C5_C44_ALI | RISK_TPH_C5_C7_ARO | RISK_TPH_C7_C8_AROM | RISK_TPH_C8_C10_AROM | RISK_TPH_C10_C12_AROM | RISK_TPH_C12_C16_AROM | RISK_TPH_C16_C21_AROM | RISK_TPH_C21_C40_AROM | RISK_TPH_C5_C44_ARO | RISK_TPH_C5_C44_ALI | RISK_EPH_C5_C44 | Total Risk TPH (C6 to C40) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **RBSL** | | | | | | | | | | | | | | | | | | | **1717** |
| **SPCE01** | 1 | *ND* | 0.14 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 7.4 | 24 | 31 | 0 | 31 | **32** |
| **SPCE01D** | 2 | *ND* | 0.13 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0 | *ND* | **0** |
| **SPCE02** | 1 | *ND* | 0.18 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 10 | 31 | 42 | 0 | 42 | **41** |
| **SPCE02D** | 2 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0 | *ND* | *ND* |
| **SPCE03** | 1 | *ND* | 0.2 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0 | *ND* | **0** |
| **SPCE03D** | 2 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0 | *ND* | *ND* |
| **SPCE04** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 5.8 | 18 | 23 | 0 | 23 | **24** |
| **SPCE05** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | 19 | 19 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 19 | 19 | **19** |
| **SPCE06** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0 | *ND* | *ND* |
| **SPCE07** | 1 | 0.28 | 0.19 | *ND* | 12 | 12 | 69 | 94 | *ND* | 0.011 | *ND* | *ND* | *ND* | *ND* | 53 | 53 | 94 | 140 | **146** |
| **SPCE08** | 1 | *ND* | 0.33 | 6.1 | 13 | 3.7 | *ND* | 24 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 24 | 24 | **23** |
| **SPCE09** | 1 | 0.12 | 0.12 | *ND* | *ND* | *ND* | 30 | 30 | *ND* | *ND* | *ND* | *ND* | *ND* | 7.3 | 97 | 100 | 30 | 130 | **135** |
| **SPCE10** | 1 | 0.23 | 0.14 | *ND* | *ND* | 6.2 | 120 | 130 | *ND* | *ND* | *ND* | *ND* | 9.3 | 16 | 390 | 420 | 130 | 550 | **542** |
| **SPCE11** | 1 | 0.18 | 0.21 | 7.4 | 52 | 54 | 120 | 230 | *ND* | *ND* | *ND* | *ND* | 27 | 54 | 120 | 200 | 230 | 440 | **435** |
| **SPCE12** | 1 | *ND* | 0.2 | 7.5 | 54 | 47 | 43 | 150 | *ND* | *ND* | *ND* | *ND* | 35 | 52 | 73 | 160 | 150 | 310 | **312** |
| **SPCE13** | 1 | *ND* | 0.27 | 12 | 76 | 60 | 32 | 180 | *ND* | *ND* | *ND* | *ND* | 45 | 69 | 26 | 140 | 180 | 320 | **320** |
| **SPCE14** | 1 | *ND* | 0.11 | 3.1 | 13 | 18 | 68 | 100 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 26 | 26 | 100 | 130 | **128** |
| **SPCE15** | 1 | 0.29 | 0.2 | 15 | 63 | *ND* | *ND* | 78 | *ND* | *ND* | *ND* | *ND* | 14 | *ND* | *ND* | 14 | 78 | 91 | **92** |

N.B Due to exceedance of the RBSL for nickel, materials represented by stockpiles SPCE11 and SPCE13 were not re-used on Area 1 but sent to top terrace.

ND - not detected above the method detection limit

**Table 6d**

**Volatile Organic Compound (VOC) Concentrations in Stockpiles Derived from Earthworks to Assess Re-use on Area 1 (mg/kg)**

| fk_location | Depth (m) | BENZENE | TOLUENE | ETHYLBENZENE | M_P_XYLENE | O_XYLENE | 1_2_DICHLOROETHANE | DICHLOROMETHANE | TETRACHLOROETHENE | TRICHLOROETHENE | VINYL_CHLORIDE | 1_1_1_TRICHLOROETHANE | 1_1_DICHLOROETHENE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **RBSL** | | 0.1 | 36 | 37 | 32 | | 0 | 5 | 11 | 1 | 0.01 | 154 | 4 |
| **SPCE01** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.012 | *ND* | 0.013 | *ND* | *ND* | *ND* |
| **SPCE01D** | 2 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.010 | *ND* | 0.016 | *ND* | *ND* | *ND* |
| **SPCE02** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.006 | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE02D** | 2 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.010 | *ND* | 0.008 | *ND* | *ND* | *ND* |
| **SPCE03** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.007 | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE03D** | 2 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE04** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.012 | *ND* | 0.018 | *ND* | *ND* | *ND* |
| **SPCE05** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.010 | *ND* | 0.008 | *ND* | *ND* | *ND* |
| **SPCE06** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.009 | *ND* | *ND* | *ND* |
| **SPCE07** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.007 | *ND* | *ND* | *ND* |
| **SPCE08** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* |
| **SPCE09** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.009 | *ND* | 0.007 | *ND* | *ND* | *ND* |
| **SPCE10** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.015 | *ND* | 0.015 | *ND* | *ND* | *ND* |
| **SPCE11** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.012 | *ND* | 0.014 | *ND* | *ND* | *ND* |
| **SPCE12** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.016 | *ND* | 0.018 | *ND* | *ND* | *ND* |
| **SPCE13** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.015 | *ND* | 0.017 | *ND* | *ND* | *ND* |
| **SPCE14** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.012 | *ND* | 0.022 | *ND* | *ND* | *ND* |
| **SPCE15** | 1 | *ND* | *ND* | *ND* | *ND* | *ND* | *ND* | 0.018 | *ND* | 0.036 | *ND* | *ND* | *ND* |

N.B Due to exceedance of the RBSL for nickel, materials represented by stockpiles SPCE11 and SPCE13 were not re-used on Area 1 but sent to top terrace.

ND - not detected above the method detection limit

**TABLE 7**
**Garden Validation Testing Completed to November 2009 (mg/kg)**

| Sample Location | Depth | Sample Date | BENZO_A_PYRENE | TOTAL_ARSENIC | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | RISK_EPH_C5_C44 | CHRYSOTILE | CROCIDOLITE | AMOSITE | TOTAL_ASBESTOS | Overall Screening Result |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GV_21 | 0.2 | 12/11/2009 | -1 | 16 | 0.25 | 13 | 34 | 37 | -1 | 31 | -1 | 17 | 140 | 60 | -1 | -1 | -1 | -1 | PASS |
| GV_22 | 0.2 | 12/11/2009 | -1 | 17 | 0.38 | 31 | 41 | 61 | -1 | 43 | 0.38 | 60 | 190 | 75 | -1 | -1 | -1 | -1 | PASS |
| GV_23 | 0.2 | 12/11/2009 | -1 | 33 | 0.91 | 17 | 100 | 72 | -1 | 24 | 0.71 | 24 | 170 | 120 | -1 | -1 | -1 | -1 | PASS |
| GV_24 | 0.5 | 19/10/2009 | 0.097 | 12 | 0.29 | 16 | 29 | 51 | -1 | 29 | -1 | 15 | 170 | 180 | -1 | -1 | -1 | -1 | PASS |
| GV_25 | 0.5 | 19/10/2009 | -1 | 14 | 0.39 | 14 | 36 | 54 | -1 | 29 | -1 | 16 | 170 | 120 | -1 | -1 | -1 | -1 | PASS |
| GV_26 | 0.5 | 21/10/2009 | -1 | 34 | 1.1 | 14 | 110 | 81 | -1 | 21 | 0.41 | 16 | 240 | 58 | -1 | -1 | -1 | -1 | PASS |
| GV_27 | 0.5 | 16/10/2009 | -1 | 7.8 | 0.33 | 16 | 31 | 38 | -1 | 32 | -1 | 12 | 150 | 89 | -1 | -1 | -1 | -1 | PASS |
| GV_28 | 0.5 | 16/10/2009 | -1 | 11 | 0.35 | 14 | 34 | 47 | -1 | 32 | -1 | 13 | 180 | 110 | -1 | -1 | -1 | -1 | PASS |
| GV_29 | 0.5 | 20/10/2009 | -1 | 8.7 | 0.3 | 12 | 22 | 29 | -1 | 19 | -1 | 8.8 | 110 | 47 | -1 | -1 | -1 | -1 | PASS |
| GV_30 | 0.5 | 16/10/2009 | -1 | 8.9 | 0.27 | 16 | 30 | 36 | -1 | 28 | -1 | 14 | 160 | 170 | -1 | -1 | -1 | -1 | PASS |
| GV_32 | 0.5 | 16/10/2009 | -1 | 9.6 | 0.26 | 16 | 34 | 48 | -1 | 36 | -1 | 13 | 120 | -1 | -1 | -1 | -1 | -1 | PASS |
| GV_33 | 0.5 | 19/10/2009 |  | 11 | 0.25 | 15 | 36 | 31 | -1 | 29 | -1 | 14 | 110 |  |  |  |  |  | PASS |
| GV_34 | 0.5 | 19/10/2009 | 0.026 | 12 | 0.2 | 14 | 22 | 25 | -1 | 28 | -1 | 13 | 110 | 47 | -1 | -1 | -1 | -1 | **PASS** |
| GV_35 | 0.5 | 19/10/2009 | -1 | 9.2 | 0.28 | 17 | 26 | 35 | -1 | 30 | -1 | 19 | 120 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_36 | 0.5 | 19/10/2009 | -1 | 11 | 0.29 | 15 | 28 | 34 | -1 | 30 | -1 | 15 | 120 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_37 | 0.5 | 19/10/2009 | -1 | 15 | 0.37 | 13 | 33 | 39 | -1 | 29 | -1 | 15 | 110 | 67 | -1 | -1 | -1 | -1 | **PASS** |
| GV_38 | 0.5 | 19/10/2009 | -1 | 24 | 0.58 | 14 | 67 | 54 | -1 | 23 | 0.41 | 16 | 150 | 110 | -1 | -1 | -1 | -1 | **PASS** |
| GV_39 | 0.5 | 20/10/2009 | -1 | 42 | 1 | 16 | 97 | 66 | -1 | 25 | 0.51 | 18 | 170 | 87 | -1 | -1 | -1 | -1 | **PASS** |
| GV_40 | 0.2 | 20/10/2009 | 0.32 | 48 | 1.3 | 16 | 130 | 96 | -1 | 24 | 0.62 | 19 | 200 | 73 | -1 | -1 | -1 | -1 | **PASS** |
| GV_41 | 0.2 | 20/10/2009 | -1 | 40 | 1.2 | 14 | 120 | 79 | -1 | 22 | 0.49 | 17 | 190 | 77 | -1 | -1 | -1 | -1 | **PASS** |
| GV_42 | 0.2 | 20/10/2009 | -1 | 12 | 0.28 | 17 | 43 | 38 | -1 | 32 | -1 | 14 | 120 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_43 | 0.2 | 21/10/2009 | -1 | 8.8 | 0.27 | 16 | 24 | 25 | -1 | 33 | -1 | 16 | 95 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_44 | 0.2 | 20/10/2009 | 0.22 | 13 | 0.5 | 14 | 40 | 46 | -1 | 31 | -1 | 13 | 120 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_45 | 0.2 | 20/10/2009 | -1 | 16 | 0.51 | 14 | 52 | 50 | -1 | 27 | -1 | 13 | 150 | 72 | -1 | -1 | -1 | -1 | **PASS** |
| GV_46 | 0.2 | 20/10/2009 | 0.01 | 4.6 | -1 | 12 | 15 | 12 | -1 | 26 | -1 | 9.7 | 92 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_47 | 0.2 | 20/10/2009 | -1 | 8 | 0.22 | 11 | 54 | 18 | -1 | 21 | -1 | 11 | 86 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_48 | 0.2 | 20/10/2009 | -1 | 8.6 | 0.23 | 13 | 60 | 18 | -1 | 21 | 0.67 | 14 | 93 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_49 | 0.2 | 20/10/2009 | -1 | 8.3 | 0.43 | 11 | 50 | 23 | -1 | 15 | 0.51 | 16 | 90 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_50 | 0.2 | 21/10/2009 | 0.044 | 15 | 0.32 | 12 | 40 | 30 | -1 | 23 | -1 | 10 | 130 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_51 | 0.2 | 21/10/2009 | 0.078 | 24 | 0.5 | 15 | 68 | 42 | -1 | 32 | -1 | 14 | 160 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_57* | 0.2 | 21/10/2009 | 2.3* | 8.7 | 0.4 | 39 | 47 | 52 |  | 37 |  | 33 | 170 |  |  |  |  |  | **FAIL*** |
| GV_58 | 0.2 | 21/10/2009 | 0.084 | 8.2 | 0.22 | 15 | 23 | 45 | -1 | 34 | -1 | 12 | 110 | 14 | -1 | -1 | -1 | -1 | **PASS** |
| GV_59 | 0.2 | 21/10/2009 | 0.029 | 7 | 0.22 | 17 | 28 | 23 | -1 | 40 | -1 | 13 | 110 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_60 | 0.2 | 21/10/2009 | 0.035 | 6.7 | 0.26 | 17 | 29 | 21 | -1 | 40 | -1 | 13 | 110 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_61 | 0.2 | 21/10/2009 | 0.057 | 7.4 | -1 | 16 | 24 | 28 | -1 | 39 | -1 | 12 | 110 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_62 | 0.2 | 21/10/2009 | 0.029 | 7.5 | 0.24 | 19 | 25 | 25 | -1 | 43 | -1 | 15 | 110 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_63 | 0.2 | 12/11/2009 | -1 | 6.1 | -1 | 13 | 11 | 18 | -1 | 38 | -1 | 15 | 100 | 140 | -1 | -1 | -1 | -1 | **PASS** |
| GV_64 | 0.2 | 12/11/2009 | -1 | 12 | -1 | 11 | 14 | 22 | -1 | 44 | -1 | 18 | 79 | 250 | -1 | -1 | -1 | -1 | **PASS** |
| GV_65 | 0.2 | 12/11/2009 | -1 | 15 | -1 | 12 | 13 | 21 | -1 | 39 | -1 | 20 | 110 | 99 | -1 | -1 | -1 | -1 | **PASS** |
| GV_66 | 0.2 | 12/11/2009 | -1 | 10 | -1 | 14 | 12 | 23 | -1 | 32 | -1 | 19 | 80 | -1 | -1 | -1 | -1 | -1 | **PASS** |
| GV_67 | 0.2 | 12/11/2009 | -1 | 6.2 | -1 | 11 | 13 | 17 | -1 | 23 | -1 | 15 | 74 | 510 | -1 | -1 | -1 | -1 | **PASS** |
| **MAX Reported Value** | | | 0.32 | 48 | 1.3 | 39 | 130 | 96 | -1 | 44 | 0.71 | 60 | 240 | 510 | -1 | -1 | -1 | -1 | |
| **SCREENING VALUE** | | | **0.9** | **64** | **3.6** | **130** | **478** | **337** | **1** | **50** | **3** | **416** | **3280** | **1717** |  |  |  | **0.02** | |

* Plot 57was excavated in full down to bedrock level on 12.11.09. Fill imported to replace this is required to meet the validation criteria for imported materials.

# Plates

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**Plate 1**: Removal of asphalt hardstand to expose underlying red granular material and black ash. Facing west from northern margin of Area D.




**Plate 2**: Excavation and dosing of granular made ground with surfactant solution prior to handpicking of asbestos containing materials (ACM). Facing north from Area C/ Phase 2 boundary.



**Plate 3**: Loading of granular made ground materials into vibrating screen prior to handpicking from a conveyor belt (Plate 4).




**Plate 4**: Handpicking of ACM from granular made ground placed on conveyor belt.

| | | | | | |
|---|---|---|---|---|---|
| Title | Area 1 Validation Report | URS | App'd: ARC | Drawn ARC | Date: August 2009 |
| Location | Area 1, Llandarcy, South Wales, UK | | DRAFT | | Ref: |
| Client | BP | | Scale: NTS | | Job No: 44382729 |
| | | | Drg. Size: A4 | | **PLATES** |




**Plate 5**: Stockpiling of treated soils for subsequent validation sampling. Groundwater treatment system (horizontal tanks) on former solvent pit area to left of background.



**Plate 6:** Stockpiles of validated granular soils at Top Terrace. Oversized concrete and foundations removed from Area 1 to right of foreground.




**Plate 7**: Red and black ash of Lower Car Park (Area A) in foreground. Facing north-westwards and Area E, from which the black ash horizon in the bank was subsequently removed.



**Plate 8**: Shallow sandstone bedrock along north western margin of Lower Car Park (Area A). Following removal of red/black ash (Plate 7).

| | | | | | |
|---|---|---|---|---|---|
| Title | Area 1 Validation Report | URS | App'd: ARC | Drawn ARC | Date: August 2009 |
| | | | DRAFT | | Ref: |
| Location | Area 1, Llandarcy, South Wales, UK | | Scale: NTS | | Job No: 44382729 |
| Client | BP | | Drg. Size: A4 | | **PLATES** |




**Plate 9**: Transformer housing associated with the demolition arisings of a former electricity substation. Bituminous material subsequently found to contain Polychlorinated Biphenyls (PCBs)



**Plate 10**: Handpicking of ACM from the footprint of the former transfer substation building following the segregation and stockpiling of demolition materials to remove PCB containing materials. Prior to removal of foundations and underlying soils.



**Plate 11**: Japanese Knotweed prior to herbicide spraying and subsequent excavation and transfer away from Area 1 to main site for treatment.



**Plate 12**: Washing down during excavation of Japanese Knotweed contaminated soils. Wheeled machines used in preference to tracked vehicles to prevent spread of rhizomes to non-affected areas.

| | | | | | |
|---|---|---|---|---|---|
| Title | Area 1 Validation Report | URS | App'd: ARC | Drawn ARC | Date: August 2009 |
| | | | DRAFT | | Ref: |
| Location | Area 1, Llandarcy, South Wales, UK | | Scale: NTS | | Job No: 44382729 |
| Client | BP | | Drg. Size: A4 | | **PLATES** |



**Plate 13**: Japanese Knotweed area following excavation of granular materials. (footprint within orange bunting). Brick wall to right of photograph subsequently removed.



**Plate 14**: Lower Car Park (Area A) to left of photo (down bank); Area D/E to right. Cut taken through black ash to natural cohesive. Thicker ash (c.1m thick) present within Area D/E. Protruding bar (former fence post) near centre of photograph marks boundary between LCP and Area D/E.



**Plate 15**: Green viscous product within granular-ash fill of Area E south. Subsequently transferred away from Area 1 to be dealt with on the main site.



**Plate 16**: Breaking out and turning over of concrete hardstand in Area G to allow ACM adhered to underside of slab to be identified and segregated.

| | | | | | |
|---|---|---|---|---|---|
| Title | Area 1 Validation Report | URS | App'd: ARC | Drawn ARC | Date: August 2009 |
| | | | DRAFT | | Ref: |
| Location | Area 1, Llandarcy, South Wales, UK | | Scale: NTS | | Job No: 44382729 |
| Client | BP | | Drg. Size: A4 | | **PLATES** |



**Plate 17**: Asbestos cement adhered to underside of concrete hardstand of Area G. Marked with yellow spray paint for subsequent segregation.



**Plate 18**: Remediation of former solvent pit area via a network of combined groundwater abstraction and soil vapour extraction wells. Network also included wells designated solely for monitoring purposes.



**Plate 19**: Remediation of former solvent pit area. Water treatment system included solids filtration and liquid phase activated carbon. Vapour treatment system comprised vapour phase carbon.



**Plate 20**: Vertical profile through the 'green' area of the 'asbestos grave'. Facing north-eastwards. Upper horizon comprises granular overburden (low asbestos content). Asbestos horizon, which includes much metal waste, overlain and underlain by ash.

| | | | | | |
|---|---|---|---|---|---|
| Title | Area 1 Validation Report | URS | App'd: ARC | Drawn ARC | Date: August 2009 |
| Location | Area 1, Llandarcy | | DRAFT | | Ref: |
| Client | BP | | Scale: NTS | | Job No: 44382729 |
| | | | Drg. Size: A4 | | **PLATES** |



**Plate 21**: 'Asbestos horizon' of the green area of the asbestos grave. Proportion of asbestos considered too high to segregate and handpick



**Plate 22**: 0.9m$^3$ capacity bags containing arisings from the 'asbestos grave' that were not found to be amenable to on-site processing. Bags sent for off-site disposal to licensed landfill



**Plate 23**: Southern bank of Lower Car Park (Area A) following tree removal but prior to excavation to achieve 1metre below Finished Floor Level (FFL) of the development platform



**Plate 24**: Similar view to Plate 23. Following removal of vegetation and excavation to FFL.

| | | | | | |
|---|---|---|---|---|---|
| Title | Area 1 Validation Report | URS | App'd: ARC | Drawn ARC | Date: August 2009 |
| Location | Area 1, Llandarcy | | DRAFT | | Ref: |
| Client | BP | | Scale: NTS | | Job No: 44382729 |
| | | | Drg. Size: A4 | | **PLATES** |

# Appendix A - Remediation Strategy

**Reference No: P/2006/1048**

**NEATH PORT TALBOT COUNTY BOROUGH COUNCIL**
**CYNGOR BWRDEISTREF SIROL CASTELL-NEDD PORT TALBOT**

**TOWN AND COUNTRY PLANNING ACT 1990**
**THE TOWN AND COUNTRY PLANNING (GENERAL DEVELOPMENT PROCEDURE) ORDER 1995**




**APPROVAL OF DETAILS**

| **Name and address of the applicant** | **Name and Address of the agent** |
|---|---|
| **BP OIL REFINERY LTD UK**<br>**TECHNICAL BUILDING**<br>**LLANDARCY**<br>**NEATH** | **URS CORPORATION LTD**<br>**COMPANY HOUSE**<br>**TOWER HILL**<br>**BRISTOL**<br>**BS2 OEQ** |

---

Whereas on the Thursday, 27 July 2006 you submitted an application for the following development:-

PROPOSAL AGREE CONDITION 8 OF PLANNING APPLICATION P/2005/1284 WITH REGARD TO THE SUBMISSION OF A SCHEME FOR REMEDIATION

LOCATION BP OIL REFINERY LTD UK LLANDARCY NEATH

**THE NEATH PORT TALBOT COUNTY BOROUGH COUNCIL AS THE LOCAL PLANNING AUTHORITY IN PURSUANCE OF ITS POWER UNDER THE ABOVE MENTIONED ACT AND ORDER HEREBY APPROVES THE DETAILS:**

Signed : .....

**Geoff White – Head Of Planning**

Date : 01/09/2006

Cont.

**Reference No: P/2006/1048**

IMPORTANT NOTES:

(1) Please note that any works carried out without compliance with the conditions attached to this approval may result in formal action being taken by the Local Planning Authority.

(2) You are advised that for full compliance with the requirements of this condition, the scheme must be implemented on site, in accordance with the approved details and that prior to the occupation of the development a validation report and results prepared by a suitably qualified person shall be submitted to and approved in writing by the Local Planning Authority.

URS

Our Ref: 44382624
26th July 2006

Nicola Lake
Development Control
Neath Port Talbot County Borough Council
Civic Centre
Neath SA11 3QZ

Dear Nicola

**Llandarcy Area 1 Development**

On behalf of BP, please find attached a copy of the proposed strategy for compliance with the requirements for remediation in respect of the Llandarcy 'Area 1' development and specifically with reference to the following planning permissions:

05/0809 - Condition 8
05/1284 - (variation of application 02/0143) Condition 8
05/1287 - (variation of application 04/1742) Condition 8

As you are aware, we have held discussions with Emma Jones of NPT and Andrea Mann of the EA regarding this strategy in draft, and would hope that it will be possible to issue a Decision Notice confirming the acceptability of the proposed strategy to Neath Port Talbot CBC in the near future.

Should any consultees have any questions concerning the strategy, please do not hesitate to either contact the undersigned, or refer them to the undersigned directly.

Yours sincerely
**URS Corporation Ltd**

David Pollok
Project Director

Enclosures:
URS letter of 17th July 2006 to E Jones of NPT
URS Memorandum of 17th July 2006 to E Jones of NPT

cc:
Geoff Byrne – BP
Phil Morris - WAG

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Our Ref: 44382624

17 July 2006

Emma Jones
Neath Port Talbot Borough Council
Civic Centre
Neath
SA11 3QZ

Dear Emma

**Re: Proposed remediation Works at Area 1, BP Oil Refinery, Llandarcy**
**Application 02/0143**

On behalf of BP, please find enclosed the remediation strategy prepared by URS (reference 44382624/BRME00001 and dated 17th July 2006), for that part of the Llandarcy refinery site known as 'Area 1'.

The purpose of the strategy is to set out the works that have been undertaken and will be undertaken with the object of discharging Neath Port Talbot's conditions relating to site investigation, risk assessment, remediation and validation in the planning permission for the residential development of Area 1 (Ref. Edward Ware Homes (EWH) layout prepared by Robert Adams architects, Drawing No. A4946/L1, Coed Darcy Masterplan, June 14, 2006).

The strategy utilises the Llandarcy site human health risk assessment which we have previously agreed with you. Site investigation data relating to Area 1 are presented in the attached reports. With respect to controlled waters, the strategy builds on earlier assessment work and the existing Remedial Action Plan; we have re-visited that work in the light of the more recent data collected and have been discussing the proposed remediation works in respect of controlled waters with Ms Andrea Mann of the Environment Agency. We believe those discussions are close to conclusion and that the strategy should be acceptable to the EA in respect of protection of controlled waters.

The successful development of Area 1 is of considerable importance to BP and its project partners, immediately preceding as it does, the proposed redevelopment of the entire Llandarcy site. While the Area 1 remediation work will be undertaken by the developer through a specialist contractor, BP will be employing URS to provide a full time site presence, monitoring the contractor's work and taking all validation samples excepting of imported materials. While this is primarily intended to provide quality assurance for BP, it should also do so for NPT and the EA. When the proposed validation scheme has been undertaken, and samples have been obtained evidencing that the proposed soil quality has been met, URS will prepare a close-out report which will be copied to NPT, documenting this.

We look forward to meeting you shortly to discuss the strategy and identify any questions or requests for clarification you may have. As you will appreciate, BP is anxious to start works on site (and most other preparatory steps to this are now complete), but wishes to receive written assurance from NPT, prior to the start of works, that provided the remediation works proposed are undertaken and validated

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as proposed, NPT will consider all planning conditions relating to site assessment and remediation discharged.

Yours sincerely
**URS Corporation Ltd**

Steve Coates
Associate Director

Encl.

- Llandarcy Area 1 Remediation Strategy, Memorandum Ref. 44382624/BRME00001 dated 17th July 2006
- BP Llandarcy Refinery, Factual Report, Area 1 Site Investigation', ref 44382624/R1395, dated 26th May 2006;
- Area 1 Main Workshop, Former Degreasing Pit Investigation, ref R1278, 28th January 2005;
- Solvent Pit RAP Issues, Additional Llandarcy Bog Water Sampling, letter ref 7601, dated 26th January 2005;
- Asbestos Delineation Works, Former BP Car Park Area', ref FR1265 dated 17th Dcember 2004;
- Observations on Removal of Underground Storage Tank, November 2002 (URS Memo, 15th November 2002) plus location plan.
- Llandarcy Refinery Development, Detailed Human Health Assessment, ref R1364, issued March 2006.
- URS Remedial Action Plan (RAP) for the Llandarcy Refinery site (DR869r3), issued 1 March 2000

URS

# Memorandum

Date: 17th July 2006

To: Emma Jones – Neath Port Talbot County Borough Council

From: David Pollok - URS

Subject: **Llandarcy Refinery 'Area 1' Remediation Strategy**

Ref: 44382624/BRME00001

## 1.0 INTRODUCTION

The purpose of this memo is to present BP's proposed remediation strategy for the part of the Llandarcy site known as 'Area 1' in the context of its proposed redevelopment for residential use under Neath Port Talbot County Borough Council (NPT) planning permission ref P/02/143 dated 9th September 2003. Figure 1, attached, shows Area 1 in the context of the wider Llandarcy site.

## 2.0 BASIS FOR STRATEGY

In order to develop this remediation strategy the following inputs have been considered:

1. Edward Ware Homes (EWH) layout prepared by Robert Adams architects, Drawing No. A4946/L1, Coed Darcy Masterplan, June 14, 2006
2. Neath Port Talbot (NPT) CBC Planning Permission (P/02/143 dated 9th September 2003)
3. URS site investigation data summarised in:
   - 'BP Llandarcy Refinery, Factual Report, Area 1 Site Investigation', ref 44382624/R1395, dated 26th May 2006;
   - 'Area 1 Main Workshop, Former Degreasing Pit Investigation, ref R1278, 28th January 2005;
   - 'Solvent Pit RAP Issues, Additional Llandarcy Bog Water Sampling, letter ref 7601, dated 26th January 2005;
   - 'Asbestos Delineation Works, Former BP Car Park Area', ref FR1265 dated 17th Dcember 2004;
   - Observations on Removal of Underground Storage Tank, November 2002 (URS Memo, 15th November 2002) plus location plan.
4. URS human health risk assessment:
   - 'Quantitative Human Health Risk Assessment', ref DR1145R, dated 13th January 2004 (NPT acceptance dated 2nd June 2004, E Jones)
   - Addendum to Detailed Human Health Risk Assessment (Screening Criteria for Asbestos Contaminated Soil, Llandarcy Refinery Development), DR1145R dated 3rd February 2004 (NPT acceptance dated 2nd April 2004, E Jones)
   - Addendum to Detailed Human Health Risk Assessment (Methodology for the Assessment of Additional Compounds for Residential, Commercial and Recreational Development), DR1272 dated 5th May 2005, NPT acceptance dated 3rd September 2004, E Jones responding to meeting minutes and follow up confirmation by e-mail on 12th January 2006)

- Addendum to Detailed Human Health Risk Assessment (selected non-threshold compounds – commercial end use), DR1215 dated 7th May 2004 (NPT acceptance dated 2nd June 2004, E Jones)
- Addendum to Detailed Human Health Risk Assessment (selected non-threshold compounds – residential end use), DR1242 dated 2nd August 2004 (NPT acceptance dated 3rd September 2004, E Jones responding to meeting minutes)
- Each of these individual risk assessments have been collated in a consolidated risk assessment report; 'Llandarcy Refinery Development, Detailed Human Health Assessment, ref R1364, issued March 2006.

5. URS Remedial Action Plan (RAP) for the Llandarcy Refinery site (DR869r3). Reviewed and accepted by the Environment Agency (EA) (5th May 2000, J/CL/SITE/Llandarcy, dated 21st December 2001, EME/CL/S/V/LlandarcyRAP/TJ, dated 6th May 2005)

The following provides the context for this remediation strategy, based on the above documents:

1. It is understood from BP, that this area of the site did not include major process plant or bulk storage of hydrocarbons. Operations in this area are believed to have included repairs and maintenance, warehousing, administration, training and car parking. The workshop operations are understood to have included a 'hydroblast' operation to clean heat exchanger bundles, including the use of the chlorinated hydrocarbon trichloroethene (TCE) in a pit at the rear of the building (solvent pit). The degreasing operation is understood to have been discontinued around 1970. The workshop building was latterly let by BP to EG Lewis, whose business is understood to have comprised maintenance of valves and related activities. A small fuel filling station was located immediately north of the site; underground storage tanks at this location were removed in 2002. The site as a whole is presently demolished to slab level;

2. the site has planning approval for residential development. This is expected to comprise mainly low density housing with private gardens. A development layout has been prepared by the developer, Edward Ware Homes. Site levels are expected to be altered to facilitate development, requiring primarily cutting and some limited filling and the installation of various retaining features to terrace the site;

3. the requirements of the planning permission directly affecting remediation are set out in conditions 9 (contamination) and 12 (land drainage). Condition 9 requires that a site investigation, risk assessment, remediation plan and validation report will be submitted to the local authority for approval on a staged basis. As noted above, URS has on behalf of BP already submitted to NPT and the EA site investigation and risk assessment reports which are intended to satisfy condition 9. This memo sets out BP's proposal with regard to remediation and validation to conclude the information required under condition 9, which will be implemented through contracts with EWH (remediation, sub-contracted to Churngold Remediation Ltd) and URS (monitoring and validation).

4. The geology of the plot comprises in simplified terms a widespread typically 0.25-0.5m thickness of granular fill over silty and clayey glacial drift over sandstone

bedrock at around 1-2m depth. In some locations, particularly in the lower car park area, glacial drift has been reworked as fill. Localised groundwater has been identified in deeper areas of drift, however, the water table has generally been found to lie within bedrock in this area;

5. Health protective remediation criteria (risk based screening levels (RBSLs)) have been developed by URS consistent with UK Government guidance to Part IIA of the Environmental Protection Act 1990. These criteria and their basis are set out in the risk assessment reports referenced above. Comparison of these criteria with the contaminant dataset for this area of the site has identified the following contamination issues of potentially significant risk to human health in soil:

    a. The presence of pieces of asbestos containing materials, including pieces of gasket, rope, lagging and cemented material within both the granular and reworked drift fill material and in places the presence of dispersed asbestos fibres in fill material. A total of 184 samples have been collected and analysed for asbestos content during the asbestos investigation and workshop investigations undertaken in 2004/5. Of these, 27 were found to contain pieces of asbestos material while a further 17 were identified as containing 'trace' amounts of asbestos. Blue, brown and white asbestos has been identified at locations within the former BP car park. During earlier work undertaken by URS in February 2003, a further 3 samples were identified as containing pieces of asbestos. Anchem Laboratories also undertook some work in this area of the site in June and July 2003. Assessment of the data set collected indicates a further 10 locations where pieces of asbestos have been identified and 8 where trace asbestos on adhering soil was identified. Of the pieces of asbestos detected, 5 were on the ground surface, including pieces of asbestos tile, vinyl tile and a gasket.
    b. Localised petroleum hydrocarbon contamination of soil. Of 55 soil samples analysed for diesel range organics (DRO), 5 exceeded the shallow soil TPH RBSL of 1,717mg/kg. Of these, 4 samples were in fill material;
    c. A total of 40 samples were recovered and analysed to investigate the metals content of the shallow soil; 27 of these samples were from fill material. Of those samples analysed from fill material, 18 exceeded one or other of the proposed metals RBSLs, in particular those for arsenic, copper, lead and zinc. Further samples have since been taken specifically from the ash fraction of the granular fill, which suggest that fraction has the greatest metal content (these samples were taken for leachate analysis to assess the suitability of the material for re-use in the Tip);
    d. A total of 60 soil samples were analysed for polyaromatic hydrocarbons (PAHs), of which 11 were reported to contain summed concentrations of the compounds analysed and expressed in terms of toxicity equivalence to benzo(a)pyrene (BaP) in excess of the proposed RBSL for BaP. Those samples exceeding the criteria were either from the fill material or the interface between the fill and underlying cohesive soils.

    A total of 55 soil samples have been analysed for selected volatile organic compounds (VOCs) based on the desk top study of the site and results of earlier work. This suite comprises mono-aromatic hydrocarbons (likely to be associated with petroleum product) and dichloromethane and methylene chloride (two

chlorinated hydrocarbons which have been utilised in the main process area (located north of Area 1) and which have been identified at other locations in the refinery).

Methylene chloride has been detected in soil samples at 6 locations at concentrations above the method detection limit of 0.005mg/kg All of these detected concentrations are almost 3 orders of magnitude lower than the RBSL of 5mg/kg.

In addition to the site-specific VOC suite analysed for in 55 soil samples, a further 10 soil samples have been subject to a standard 'full' VOC analysis. These samples are predominantly associated with the investigation work undertaken in the solvent pit area. None of these samples were reported to have any VOC analyte at a concentration above the method detection limit of 0.005mg/kg.

6. Comparison of the RBSLs with the contaminant dataset for groundwater for this area of the site has identified the following issues of potentially significant risk to human health:

    - Trichloroethene, 1 location at 3 depth intervals (WSB007da/d2 and d3), maximum concentration of 5.4mg/l versus RBSL of 2.6mg/l
    - Vinyl chloride, 5 locations (WSB006, 007, 008, 009 and 013), maximum concentration of 4.9mg/l versus RBSL of 0.06mg/l
    - 1,2-Dichloroethene, 2 locations (WSB006 and 007), maximum concentration of 27.4mg/l versus RBSL of 15mg/l

    No free phase hydrocarbon has been detected using an air-oil-water interface probe in monitoring wells during the most recent gauging (spanning September 2003 to March 2005 depending on well location). Previously, free phase hydrocarbon in excess of 2mm has been detected at 4 locations in Area 1 (MSMW060, MSMW061, P1AF007 and P1BH011), all within the bedrock unit. That free hydrocarbon is no longer observed may be accounted for by the expected general reduction in mobility with the passage of time, as there is no known plausible continuing hydrocarbon source in this part of the site.

7. A controlled waters and environmental risk assessment has been developed previously for the refinery site and a programme of remediation actions (the RAP) agreed with the the EA and Countryside Council for Wales (CCW) on that basis. No requirement for remedial works to address controlled waters or environmental risks was identified within Area 1.

    As the presence of solvent contamination associated with the workshop was identified subsequent to the RAP, a re-assessment of the risks to Llandarcy Bog was made, which concluded that the contamination observed was unlikely to be a significant risk. This is discussed further in Section 4.3, below.

    The remedial works proposed to facilitate residential development are expected to reduce further, such risk as there may be to controlled waters and the wider environment by the reduction of contaminant mass.

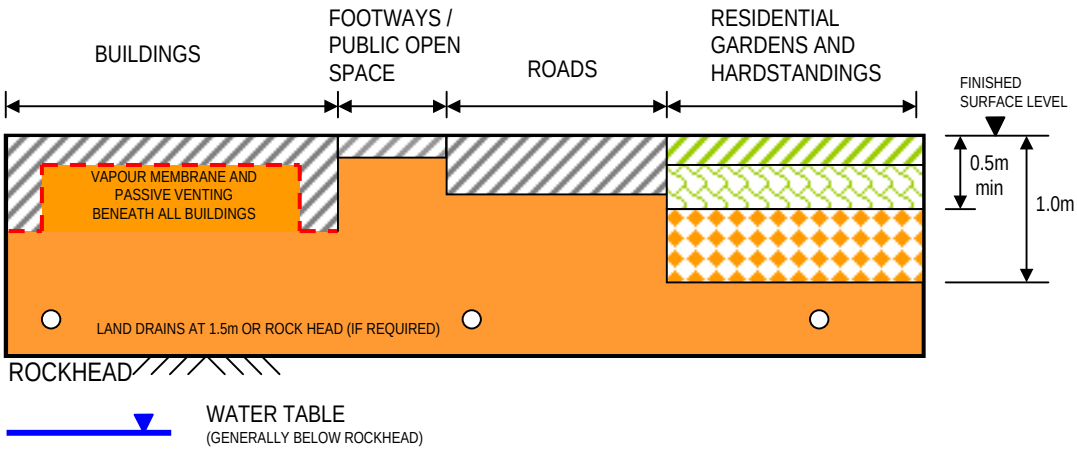
## 3.0 REMEDIATION CONCEPT

The following concept has been prepared with the objective that the development site will be suitable for residential use with respect to ground contamination and that this should also be the perception of future occupants. The quality of the site following remediation will be determined by validation sampling on the approximate frequencies set out later in this document. Soil from which validation samples do not meet the criteria (RBSLs) in the validation suite, also set out below, will be subject to further remediation. Although the ground will be remediated to this standard, membranes and venting layers will be required to be provided by the developer in all buildings which are routinely occupied.

To achieve the final finished levels while satisfying design constraints such as maximum highway gradients, it is expected that significant net cutting of soil and some cutting of rock will be required. After removal of known and suspected contaminated material, and quality validation, it is proposed to re-use as much of the surplus soil and rock as is suitable and needed elsewhere on the wider Llandarcy site, subject to meeting waste management requirements to be agreed with the EA.

### 3.1 - Remedial Concept (excluding Lower Car Park)

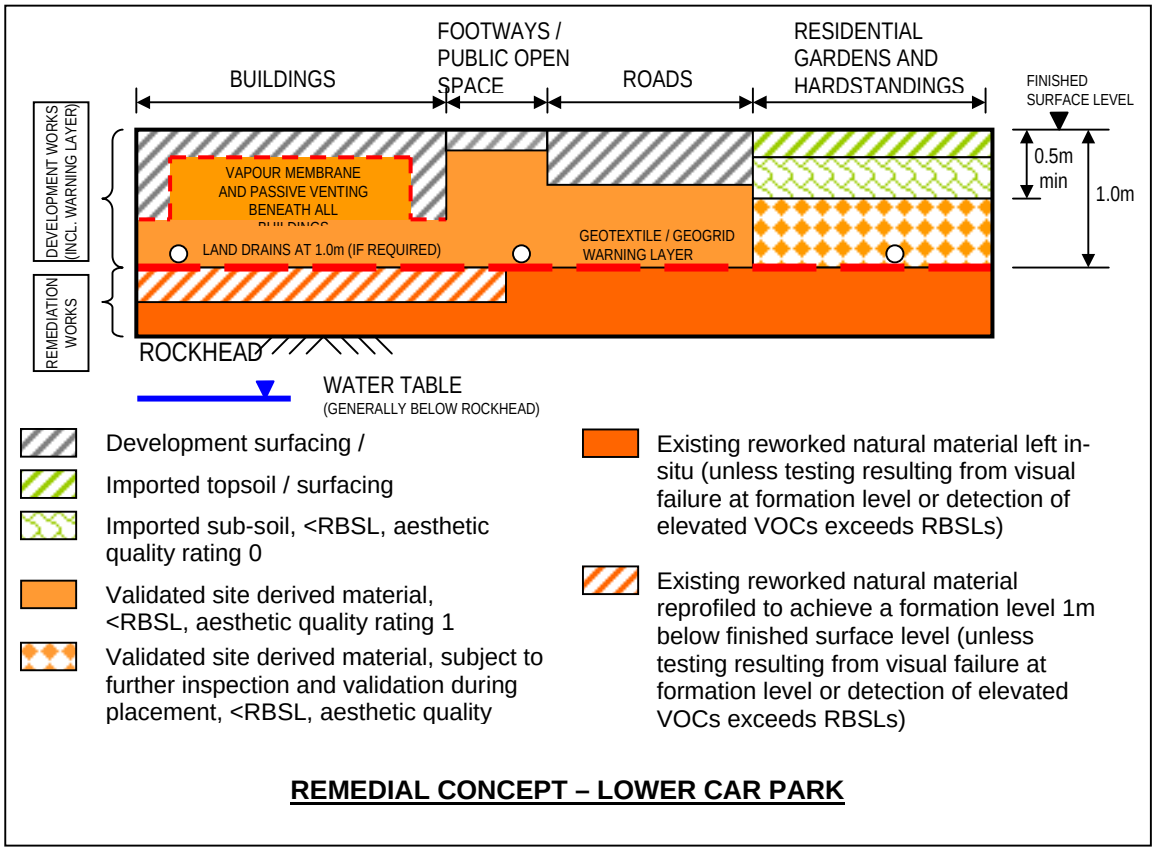
The following schematic is intended to apply generally across Area 1, excepting the Lower Car Park and the Solvent Exclusion Area (both shown on Figure 2). Details of the concept in the Lower Car Park are presented in Section 3.2 and of the proposals for the former solvent pit area in section 4.3. The Developer will be prevented by the terms of the development agreement with BP from construction of residential dwellings within the Solvent Exclusion Zone on a precautionary basis.




**REMEDIAL CONCEPT – AREA EXCLUDING LOWER CAR PARK**

### 3.2 - Remediation Concept - Lower Car Park

The Lower Car Park contains reworked natural soil in which occasional asbestos materials have been identified. In this area, the Developer will place a continuous cap of not less than 1m thickness of material. This cap material will meet the Area 1 RBSLs. The cap will be placed over a continuous suitable geo-textile / geo-grid that shall act as a warning layer, permit the passage of water but resist penetration by light manual excavation. Prior to placing the warning layer an inspection will be made for any evidence of potential volatile contamination of the exposed surface of the underlying material. If such evidence is observed, material will be tested and if potentially posing a vapour risk, removed prior to placement of the top metre.




**REMEDIAL CONCEPT – LOWER CAR PARK**

If levels are to be built up in the Lower Car Park such that the depth of fill required is greater than 1m, imported material or material won from Area 1 will be used to make up the ground beneath the warning and final 1m capping layer as shown. Material derived from the Lower Car Park may be used.

A record of the location, thickness and nature of materials placed as a cap will be maintained by the Developer. The Developer will prepare details in advance of commencement of the works in the lower car park for dealing with service excavations foundations etc. that extend beneath the 1m cap.

Excavated materials from the lower car park will not be used in Area 1 excepting for re-profiling the lower car park beneath the 1m cap and warning layer.

### 3.3 – Summary

The key features of this concept are:

1. It is intended that following remediation, soil materials will be of better quality than the remedial criteria generally in the area excluding the Lower Car Park and in at least the first metre below finished level in the Lower Car Park. The level of confidence that this has been achieved will be determined by the validation sampling strategy adopted;
2. The proposed approach of physically removing the identified granular fill material from the site is an intrinsically conservative approach which removes reliance on the quality of treatment or validation of this material as far as Area 1 is concerned. This key component of the remediation scheme will have the effect of substantially addressing the issues of both asbestos and metals content in site soils to a high degree of confidence. The content of those materials in the remaining site soils will nonetheless be validated;
3. The sequencing of the soils remediation relative to construction means that soil remaining on site following remediation will be validated in-situ, prior to final profiling of the site. The final location of soil within Area 1 following construction may therefore be different to that directly following validation. As a further precautionary measure, once the site has been profiled and construction has advanced to the point that property boundaries are known with confidence, the soil which will form the second half metre below finished level in garden areas will be turned over mechanically or placed in a controlled manner and subject to visual inspection by URS. Final validation samples will be taken of that layer down to the warning membrane in the Lower car Park and down to rock head in the area excluding the Lower Car park.
4. A vapour resistant membrane and passive venting layer will be incorporated by the developer into each house or other building likely to be routinely occupied by people. This measure is intended to address any risk to health arsing from vapour ingress to buildings from contamination remaining in-situ, including volatile contamination in groundwater. In practice, no contamination of groundwater has been detected in excess of the residential RBSLs except in the Solvent Exclusion Zone, where construction is precluded;
5. Aesthetic criteria will be utilised as well as RBSLs with the aim that the perception of the ground quality is good, as well as its actual quality;
6. In the event that site development results in a plausible risk that future residents may come into contact with groundwater from the bedrock, the Developer will install land drains at a minimum depth of 1m (below final ground level) and a maximum of 1.5m or rockhead, whichever is shallower. The purpose of such drainage would be to control ground water level as a precautionary measure in the event that contaminated water remains within the rock. Provision would be made for discharge of any water arising, appropriate to its quality;
7. restrictive covenants will be required by BP to be incorporated into the house sale agreements such that the integrity of vapour membranes are to be maintained and that these are incorporated into extensions and new buildings likely to be occupied by people. Installation of groundwater wells will be precluded. In the lower car park covenants will be required such that the integrity of the capping layer is maintained.

The remainder of this memo presents the rationale and strategy for works to implement the remediation concept.

## 4.0 PROPOSED REMEDIATION WORKS

### 4.1 Asbestos in Soil

The primary remediation driver in the development area is considered to be the asbestos contamination. As illustrated in the asbestos delineation report, a 'trace' content of asbestos fibres has been identified in the granular fill on a widespread but irregular basis across much of the development area. Laboratory analyses to date suggest that where detected, asbestos fibres constitute less than 10ppm in soil. This compares with URS' proposed RBSL for dispersed asbestos fibres in soil in residential areas of 200ppm. Pieces of asbestos containing material have also been found in that material but less frequently. On the basis of the available data obtained on an approximate 20m-25m interval, it is likely therefore that most of the granular material is acceptable in a residential context from the viewpoint of dispersed asbestos fibres.

In the Lower Car Park, it is inferred that a layer of drift material reworked as fill has been placed to raise the ground level. This fill yielded some samples containing pieces of asbestos material.

Given the proposed residential nature of the development and the undesirability that visible pieces of asbestos materials be uncovered during or after development a conservative strategy has been adopted whereby it is proposed that he granular fill is generally excavated and removed from Area 1. This will also have the effect of addressing the large majority of the identified PAH and metals contamination.

The available data provide, however, a good basis for minimising disposal and the consumption of landfill space in favour of the re-use of much of the granular fill as an engineering material in a less sensitive location. It is therefore intended that the granular fill material be excavated and sorted in a manner which permits continuous visual inspection and manual removal of pieces of observed asbestos material. Removed material will be bagged for disposal at an appropriate off-site facility. The inspected material will then be tested for its asbestos content. It is proposed the material that passes inspection and testing be beneficially re-used elsewhere on the Llandarcy site, either in the former site Tip as part of an agreed restoration programme, or for commercial or recreational development. In any event, re-use would be subject to agreement with NPT regarding the suitability of the material for the proposed re-use and with EA regarding both suitability and waste management issues.

Site investigation data suggest that asbestos materials are less frequent in the cohesive fill in the Lower Car Park than the more widespread granular fill. It is proposed to segregate all material known and suspected not to meet the validation criteria during any excavation works in the Lower Car Park and validate the quality of the balance of the material. Surplus material meeting the validation criteria would be removed from Area 1, but if validated as meeting the validation criteria, would be

proposed to be reused elsewhere on the wider Llandarcy site, again subject to appropriate agreement with NPT and EA.

### 4.2 Contamination Other Than Asbestos in Soil

Excepting in the Lower Car Park beneath the capping layer, it is proposed that identified contamination in excess of the RBSLs will be excavated and either disposed of off site or re-used elsewhere on the wider Llandarcy site if permitted by the EA and NPT. As any such re-use is not critical to the development of Area 1, it is not discussed further here. Excavated material not meeting the validation criteria and/or surplus to requirement in Area 1 will, if considered to be waste by the Environment Agency, be temporarily stockpiled in the area identified in Figure 3. The stockpiles will be managed and will be segregated according to material quality i.e. surplus meeting validation criteria and material not meeting validation criteria. The latter will be reviewed for suitability for further treatment (e.g. bio-treatment). In the event that the material is not suitable for re-use nor further remediation to render it suitable it will be disposed of to licensed landfill. Material agreed not to be waste will be stockpiled elsewhere on the Llandarcy site.

The only contamination issues of concern identified in cohesive soil (ie which would remain in-situ after the granular fill is stripped) are TPH contamination at one location and PAHs at two locations. As fill material is stripped and the surface of the natural soil exposed, samples will be taken and analysed for evidence of elevated vapour concentrations using a portable photo-ionisation detector to provide evidence of the presence of VOCs, if present. A visual inspection will also be maintained for evidence of staining. It will not be possible to make observations of odour until all works to remove potentially asbestos containing materials is complete. The areas of contamination previously identified in excess of RBSLs and any additional contamination identified in excess of RSBLs or aesthetic criteria will be excavated and either disposed of off site or, if suitable and subject to appropriate permissions, transferred for re-use elsewhere on the Llandarcy site.

### 4.3 Residual Solvent Contamination

URS has been discussing with the EA a rationale and strategy in respect of residual solvent contamination. Subject to agreeing the interpretation of data from a final monitoring round, this is expected to be agreed as summarised below.

Future residents could in principle be exposed to VOC contaminated groundwater via inhalation of vapours. In the areas where such contamination has been detected, groundwater is in the bedrock. On the basis of the available data, there would be an implied risk to future site occupants from groundwater contamination in wells WSB006, WSB007, WSB008, WSB009 and WSB013 under a residential scenario.

While this potential risk would be addressed by the vapour membranes and passive venting which will be required to be incorporated into all properties, as a precautionary measure, construction will in any event be precluded over the area in which contamination has been detected in excess of RBSLs (Solvent Exclusion Zone, Figure 2). It is proposed that the solvent exclusion zone will be finished as public open space, using site derived and imported soils which will be subject to

validation as set out further below. This open space will be underlain with low permeability soil and designed with a slight convex landform located over the former pit as a further precaution, with the objective of minimising infiltration of recharge to the pit area.

The RAP for the Llandarcy site as a whole has been accepted by the Environment Agency and forms the basis of an ongoing programme of remedial works being undertaken by BP to provide protection to the sensitive receptors that surround the site. One of the fundamental bases of the RAP is that the water beneath the site should be considered a pathway to surrounding controlled waters and environmental receptors, rather than a receptor itself. In the case of Area 1, the most plausible controlled water receptor for contamination emanating from the solvent pit is the Llandarcy Bog.

Given the passage of more than 30 years since solvent operations were reportedly discontinued, URS would expect that migration of chlorinated hydrocarbon from the source area will have reached static equilibrium or be declining. This analysis is supported by consideration of the limited extent of contamination and its speciation, which suggests active decay. As construction is to be precluded in the area in which chlorinated hydrocarbons have been detected in excess of RBSLs and as groundwater sampling has resulted in no detection of chlorinated solvents in wells on the margin of the Llandarcy Bog, it is concluded that there is not likely to be significant risk from the solvent pit contamination. It is not therefore considered necessary on the basis of the risk assessment to undertake remediation either to facilitate development or to protect controlled waters.

This assessment of risk notwithstanding, BP proposes to undertake limited voluntary remedial works in the vicinity of the solvent pit. It is envisaged that this will comprise the installation of 6 to 10 wells, following which a temporary groundwater suppression and vacuum extraction system will connected. The remedial system would be designed to temporarily lower the groundwater and encourage airflow within the unsaturated zone to volatilise and reduce residual solvent mass. No specific remedial targets are proposed as there is no risk-basis for the works, but there would be an intent to provide future betterment of groundwater quality in the area by reducing the source mass and therefore substantially accelerate the future process of natural attenuation. A likely operation period of 6-9 months is anticipated.

### 4.4 Cliff Seepage

There have in the past been observations made of hydrocarbon seepage or sheens from the western end of the cliff face at the northern edge of the development area. This seepage is presumed to have been associated with historical operational losses of hydrocarbon from process plant and tankage which was located on the terrace above the cliff to the west; this plant has been demolished for several years. To the north is a only narrow peninsular of elevated bedrock, beyond which the topography falls away again to the north; operational losses on this peninsular are thought much less likely as there were virtually no infrastructure located there and therefore hydrocarbon seepage from the main (north) face of the cliff is unlikely.

Observations of seepage have diminished with time, which is to be expected as the facilities above the cliff were demolished in 2001-2002 and residual hydrocarbon in the ground would be expected to have diminishing mobility without a continuing source.

It is thought unlikely that measures will be required to manage hydrocarbon seepage in order to facilitate development of Area 1, however, the cliff face has been cleaned by high pressure water washing and is presently subject to regular inspection which is expected to continue until shortly before construction, to verify that seepage management is not required. It should be noted that the west face of the cliff falls into Phase II of the EWH development; consequently an approximately one year period is available for monitoring. In the event that management of seepage is thought necessary, or desirable on a precautionary basis, the development layout reserves sufficient space such that an appropriate system, for example using layered geotextiles, could be affixed to the western rockwall to both screen seepage for aesthetic purposes and convey it to a collection drain.

### 4.5 Groundwater Drainage

Works to terrace the site are expected to result in cutting and also for the need for retaining structures in the lower areas of the site.

In the event that site development results in a plausible risk that future residents may come into contact with groundwater from the bedrock, the Developer will install land drains at a minimum depth of 1m (below final ground level) and a maximum of 1.5m or rockhead, whichever is shallower. The purpose of such drainage would be to control ground water level as a precautionary measure in the event that contaminated water remains within the rock. Provision would be made for discharge of any water arising, appropriate to its quality;

Limited contamination has been detected in groundwater beneath Area 1, with no exceedences of residential RBSLs observed, except in groundwater in the bedrock in the Solvent Exclusion Zone. While limited free hydrocarbon product has been noted in earlier groundwater monitoring rounds, none has been noted more recently.

It is noted that condition 12 of the planning permission requires that no land drainage shall be allowed to flow to the existing foul drain in order to limit the flow of water to the foul drainage system. It is therefore proposed that in the event that land drainage is required, it will discharge in common with the stormwater drainage system via an interceptor. It is expected that this will entail a low volume discharge with a petroleum hydrocarbon content not dissimilar to that from a carpark.

### 4.6 Lower Car Park

As illustrated in the remediation concept, it is proposed that the area of the current Lower Car Park (Figure 2) will be engineered so that after construction a 1m layer of imported material of quality better than the RBSLs will be present overlying a membrane selected so as to permit the passage of water (to prevent ponding in the

overlying material) and to resist light excavation so as to serve as a 'warning layer' as to the presence of underlying, unremediated soil.

### 4.7 Phasing

It is envisaged that the remediation works will commence following completion of demolition activities, which include the removal of the former workshop slab with the exception of the Solvent Exclusion Zone, and then proceed generally as follows:

1. Solvent remediation area fenced-off, system installed and operation commenced;
2. Removal of hardstanding;
3. Excavation and removal of non-asbestos hotspots;
4. Progressive stripping of surface cover, grubbing-up of redundant services and excavation of granular fill for treatment with stockpiling of treated material;
5. Removal of soil known to be surplus to earthworks requirements and expected to meet the validation criteria for validation ex-situ prior to re-use outside Area 1;
6. Validation of remaining soils in-situ;
7. Soils programme completed in solvent treatment area including validation, following completion of solvent remediation;
8. placement of warning layer and cap in the lower car park;
9. There is a 30m corridor, centred on an existing high pressure gas main and pressure reduction station, in which excavation will not be permitted prior to the decommissioning and removal of those features. Since soil remediation will be needed once these facilities are finally removed, re-mobilisation may be required to complete this element.

Installation of any land drains and installation of vapour membranes will be carried out by Edward Ware Homes as part of the construction programme.

## 5.0 VALIDATION

Validation sampling and analysis is a key aspect of the remediation strategy.

There are five aspects to the validation of the proposed remediation of Area 1: (i) sampling and testing of materials prior to re-use outside Area 1, including treated granular fill material, (ii) sampling and testing of the edges of excavations made to remove identified contamination below the granular layer, (iii) grid sampling and testing of soils in-situ after the remediation works are believed complete, (iv) sampling and testing of imported materials, and (v) confirmatory inspection of site derived soil in garden areas after final earthworks. Approximate sampling frequencies in each instance are set out in the Table below and proposed analytical methods are presented in Appendix A. Of these items, it is envisaged that:

1. URS personnel will undertake items (i), (ii) and (iii), the latter being undertaken at the conclusion of works in a given area;
2. the Developer will undertake item (iv) and report the results to BP/URS.

A key element of the validation programme (excluding the Lower Car Park) is as follows. On completion of remediation works it is proposed to validate the quality of

the remaining soil on a 15m grid, with analysis of soil samples from surface at 0.7m depth intervals to rockhead. All samples would be analysed for the validation suite such that comparison can be made with relevant RBSLs. If any exceedences of RBSLs are reported, further excavation of the relevant area will be undertaken. Further validation will be undertaken at the rate of one composite sample from the second half metre below finished level (ie the shallowest soil not imported) per garden, during the construction works. Considering the limited nature of the known potentially contaminative prior uses of Area 1, and as the soil being tested is expected to be generally natural material in-situ, the validation frequency proposed is recommended as conservative.

The full validation test programme proposed is as follows:

| ***Category*** | ***Source/Final Location*** | **Responsible Party** | **Testing for the Validation Suite at the following frequency:** | **Test Suite** |
|---|---|---|---|---|
| 1 | Imported quarried material | contractor | 1 per 500$m^3$ ex situ, composite of 5 regular sub-samples | VS |
| 2 | Imported Soil from greenfield Site | contractor | 1 per 250$m^3$ ex situ, composite of 5 regular sub-samples | VS |
| 3 | Imported Soil from brownfield Site | contractor | 1 per 25$m^3$ ex situ, composite of 5 sub-samples | VS |
| 4 | Crushed rock arising from excavation during development for use in capping layer | project manager | 1 per 25$m^3$ ex situ, composite of 5 sub-samples | VS |
| 5 | Soil in-situ beneath granular fill once granular fill is removed (Excl. Lower Car Park) | project manager | 15m grid / 1 per 225$m^2$, at 0.7m vertical intervals to rockhead | VS |
| 6 | Stockpiled excavated materials for TPH/PAH exceedences | project manager | 1 per 50$m^3$ ex situ, composite of 5 sub-samples | TPH/PAH as appropriate |
| 7 | Stockpiled treated granular fill materials | project manager | 1 per 50$m^3$ ex situ, composite of 5 sub-samples | Asbestos Only |
| 8 | Excess site-won materials arising from contractor's earthworks (after removal of suspect contaminated material) for re-use in commercial or recreational development | project manager | 1 per 500m3 ex situ, composite of 5 sub-samples | VS |
| 9 | Testing of in-situ below 1m in Lower Car Park | project manager | As required based on visual inspection | VS |
| 10 | Face of remedial excavations (identified TPH/PAH RBSL | project manager | 1 per 10m2, minimum of 1 per face | TPH/PAH as appropriate |

| *Category* | *Source/Final Location* | Responsible Party | Testing for the Validation Suite at the following frequency: | Test Suite |
|---|---|---|---|---|
| | exceedences) | | | . |
| 11 | Along existing service excavations | project manager | 1 per 20m of trench | VS |
| 12 | Material won from agreed location elsewhere on BP Llandarcy | contractor | 1 per 50m$^3$ ex situ, composite of 5 sub-samples | VS |
| 13 | Site derived material between 0.5m and 1m below FSL in residential plots (Lower Car Park only) | project manager | 1 per garden, composite of 5 sub-samples | VS |
| 14 | Site derived material between 0.5m below FSL and rock head in residential plots (area excluding Lower Car Park only) | project manager | At 0.7m vertical intervals in each garden | VS |

VS – Validation suite comprising TPH, VOC, PAHs, Metals and Asbestos (test specification in Appendix A)

* - Suite to be agreed with URS

Upon completion, URS will prepare a validation report summarising the remediation and validation works undertaken and their rationale, presenting the validation data and offering an opinion as to the suitability of the remediated area for residential redevelopment on that basis.

The following table presents the validation suite and criteria which represent the quality targets to be met at the frequencies set out above:

| Parameter | All remaining soils, excavated surplus soils and imported material (mg/kg)* Residential | Excavated treated granular material (mg/kg) |
|---|---|---|
| Asbestos (sum of all types) | 200 | 200 |
| Arsenic | 64 | The quality of the material will not be affected by its proposed treatment, other than as regards the asbestos content. Testing of this material for parameters other than asbestos has already been undertaken. |
| Cadmium | 3.6 | |
| Chromium | 130 | |
| Mercury | 1 | |
| Nickel | 50 | |
| Selenium | 3 | |
| Lead | 337 | |
| Vanadium | 416 | |
| Copper | 478 | |
| Zinc | 200 | |
| Benzene | 0.12 | |
| Ethylbenzene | 37 | |

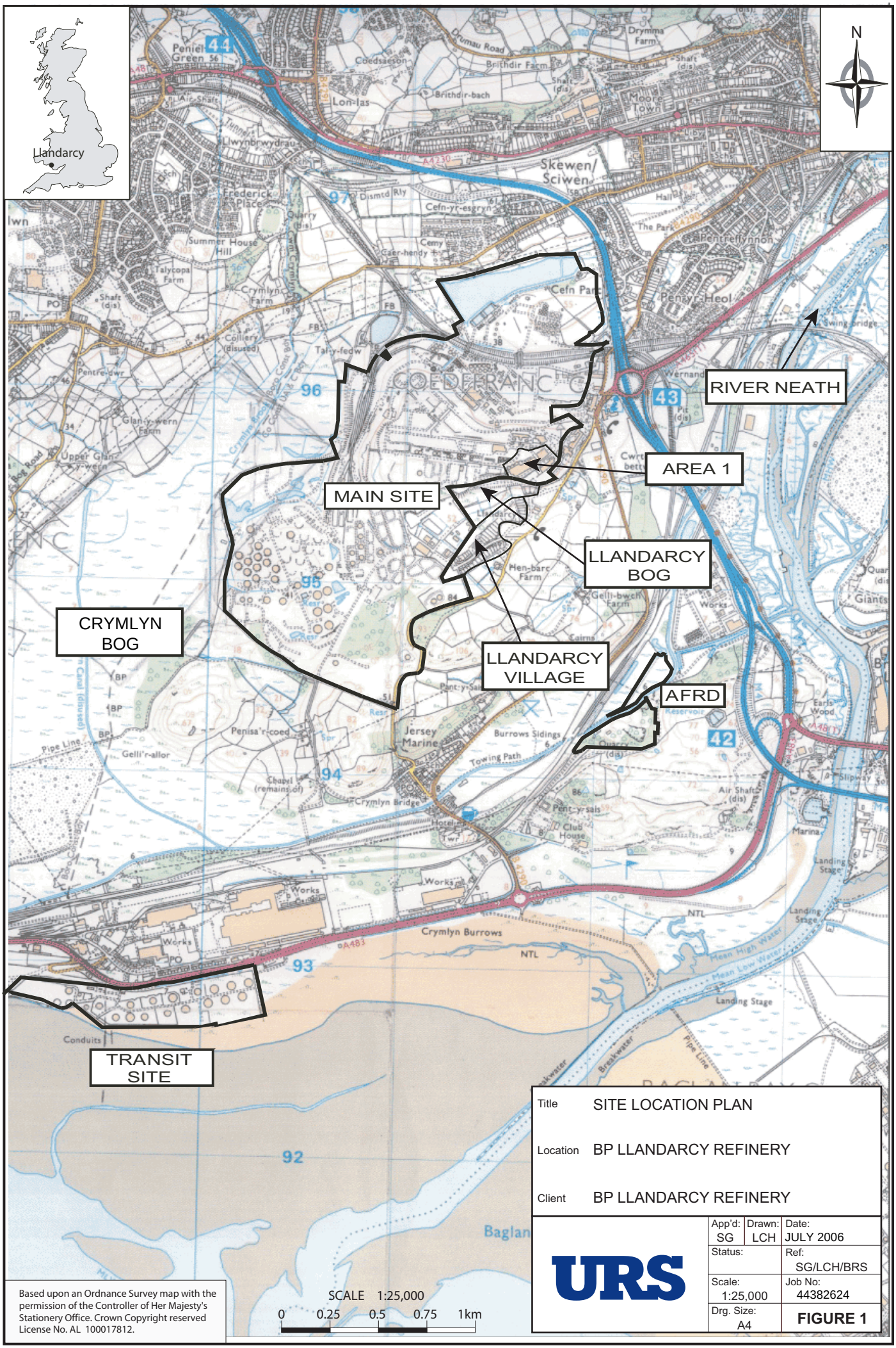
| Parameter | All remaining soils, excavated surplus soils and imported material (mg/kg)* Residential | Excavated treated granular material (mg/kg) |
|---|---|---|
| Toluene | 36 | |
| Xylene | 32 | |
| Benzo(a)pyrene** | 0.9 | |
| 1,2-Dichloroethane | 0.04 | |
| Dichloromethane | 5 | |
| Tetrachloroethene | 11 | |
| Trichloroethene | 1 | |
| Vinyl Chloride | 0.01 | |
| 1,2-Dichloroethene | 4 | |
| 1,1,1-Trichloroethane | 154 | |
| TPH | 1,717 | |

* Excludes existing natural reworked material in Lower Car Park (unless testing is required due to visual failure at formation level or elevated VOC detection)
**In the absence of published UK soil guideline values for PAHs, the UK published health criteria values for benzo(a)pyrene have been used to derive an RBSL for BaP based on the agreed risk assessment methodology for Llandarcy. 12 of the 16 US EPA priority PAHs are considered to be carcinogenic. In order to provide a mechanism for comparing the concentration of the remaining 11 carcinogenic PAHs with an RBSL, the concentrations of each of the eleven PAHs should be multiplied by their corresponding toxicity equivalency factor (TEQ or TEF) to BaP and summed. The summation of the resulting values for these 11 plus the concentration of BaP should be compared directly to the RBSL for BaP.

Together the above parameters comprise the 'Validation Suite'.

In addition to the chemical quality criteria, aesthetic quality targets are described as follows:

| Rating | Visual | Olfactory |
|---|---|---|
| 0 | No Staining | No Odour |
| 1 | Occasional Discolouration | Faint Odour |
| 2 | Frequent Discolouration | Distinct but not strong |
| 3 | Small amounts of heavy staining | Strong odour |
| 4 | Heavy black staining | Strong odour discernable in ambient air |
| 5 | Visible product | Overwhelming Odour |




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| | |
|---|---|
| Title | SITE LOCATION PLAN |
| Location | BP LLANDARCY REFINERY |
| Client | BP LLANDARCY REFINERY |

URS

| App'd: | Drawn: | Date: |
|---|---|---|
| SG | LCH | JULY 2006 |
| Status: | | Ref: SG/LCH/BRS |
| Scale: 1:25,000 | | Job No: 44382624 |
| Drg. Size: A4 | | **FIGURE 1** |

DO NOT SCALE




## NOTES

1. ALL SETTING OUT COORDINATES IN MILLIMETRES
2. SOURCE DATA FOR BOUNDARIES: PLANNING BOUNDARY – ARUP DWG 113013/CG1251/P0, PLANNING APPLICATION NO 3 SUBSTITUTED LAND, DATED 05.04.05
3. SOURCE DATA FOR REMEDIATION BOUNDARY: BASED ON EDWARD WARE HOMES DEVELOPMENT LAYOUT SUPPLIED TO URS BY ROBERT ADAM ARCHITECTS 06.12.05

## POINT SETOUT COORDINATES

| | | |
|---|---|---|
| 1 | 271500379E | 195564902N |
| 2 | 271500893E | 195538712N |
| 3 | 271576552E | 195538614N |
| 4 | 271733550E | 195497500N |
| 5 | 271800574E | 195522312N |
| 6 | 271862067E | 195635610N |
| 7 | 271808704E | 195667893N |
| 8 | 271808642E | 195670984N |
| 9 | 271805744E | 195672673N |
| 10 | 271816285E | 195690754N |
| 11 | 271807152E | 195696098N |
| 12 | REMOVED | |
| 13 | REMOVED | |
| 14 | REMOVED | |
| 15 | REMOVED | |
| 16 | REMOVED | |
| 17 | REMOVED | |
| 18 | 271559803E | 195620186N |
| 19 | 271561361E | 195604006N |
| 20 | 271766407E | 195722894N |
| 21 | 271607139E | 195725653N |
| 22 | 271648306E | 195716264N |
| 23 | 271630990E | 195714634N |
| 24 | 271629495E | 195707831N |
| 25 | 271664156E | 195678817N |
| 26 | 271659391E | 195675013N |
| 27 | 271654628E | 195691481N |
| 28 | 271574552E | 195593385N |
| 29 | 271581152E | 195591913N |
| 30 | 271547179E | 195539852N |
| 31 | 271554788E | 195620588N |
| 32 | 271586279E | 195595740N |
| 33 | 271597745E | 195615789N |
| 34 | 271603646E | 195639460N |
| 35 | 271598525E | 195640746N |
| 36 | 271810711E | 195663021N |
| 37 | 271800780E | 195645704N |
| 38 | 271792987E | 195625373N |
| 39 | 271747877E | 195576857N |
| 40 | 271766012E | 195554210N |
| 41 | 271774902E | 195555223N |
| 42 | 271794322E | 195550817N |
| 43 | 271817019E | 195562278N |
| 44 | 271826366E | 195573428N |
| 45 | 271836841E | 195584355N |
| 46 | 271642512E | 195701186N |
| 47 | 271649069E | 195696564N |
| 48 | 271769622E | 195717490N |
| 49 | 271772431E | 195722664N |
| 50 | 271776642E | 195728668N |
| 51 | 271782772E | 195724780N |
| 52 | 271788170E | 195732744N |
| 53 | 271808027E | 195720918N |
| 54 | 271804669E | 195714963N |
| 55 | 271814455E | 195709546N |

## LEGEND

- REMEDIATION BOUNDARY
- LOWER CAR PARK
- SOLVENT EXCLUSION ZONE
- CLIFF FACE UNDER SURVEY

| | | | | |
|---|---|---|---|---|
| A | BOUNDARIES AMENDED. | MW | JH | 21.06.06 |
| BY | DESCRIPTION | DRAWN | CHECKED | DATE |

STATUS: INFORMATION


CONSULTING ENGINEERS

URS

COMPANY HOUSE, TOWER HILL, BRISTOL. BS2 0EQ.
TEL 01173-178500 FAX 01173-178549


CLIENT: BP LLANDARCY

PROJECT: LLANDARCY REFINERY AREA 1

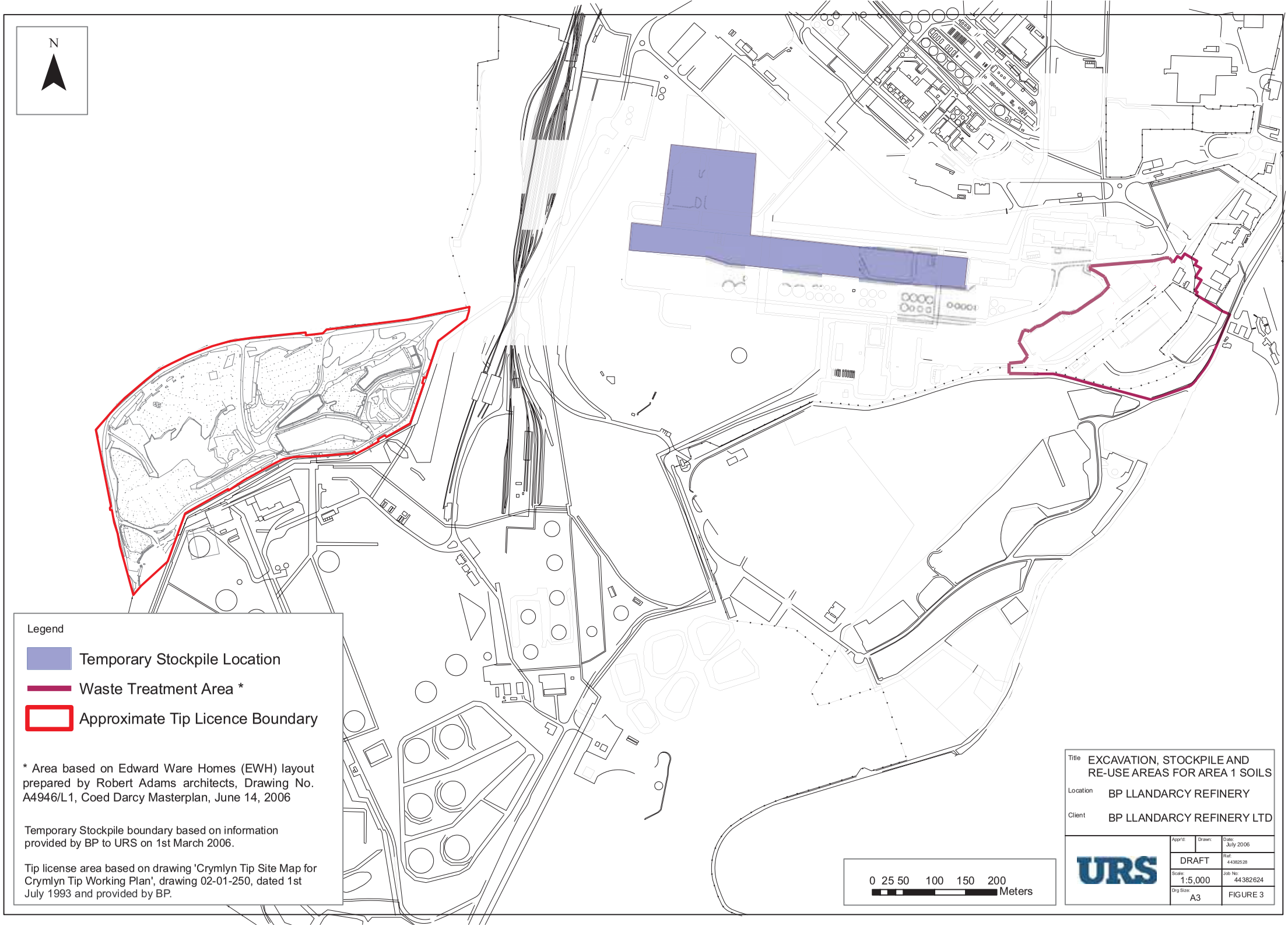
DRAWING TITLE: FIGURE 2 AREA 1 REMEDIATION COED D'ARCY DEVELOPMENT

| DRAWN | TRACED | CHECKED | APPROVED | DATE |
|---|---|---|---|---|
| LC | - | SWC | DP | MAR 06 |

| SCALE | DRG No. | REV. |
|---|---|---|
| 1:500 | 44382624/0008 | A |

ORIGINAL DRAWING A0

CAD drawing plotted on 17th July 2006 at 17:42 by LUKE_COLLINS


N
Legend
Temporary Stockpile Location
Waste Treatment Area *
Approximate Tip Licence Boundary
* Area based on Edward Ware Homes (EWH) layout prepared by Robert Adams architects, Drawing No. A4946/L1, Coed Darcy Masterplan, June 14, 2006
Temporary Stockpile boundary based on information provided by BP to URS on 1st March 2006.
Tip license area based on drawing 'Crymlyn Tip Site Map for Crymlyn Tip Working Plan', drawing 02-01-250, dated 1st July 1993 and provided by BP.
0 25 50 100 150 200
Meters
Title EXCAVATION, STOCKPILE AND RE-USE AREAS FOR AREA 1 SOILS
Location BP LLANDARCY REFINERY
Client BP LLANDARCY REFINERY LTD
URS
Appr'd:
Drawn:
Date: July 2006
DRAFT
Ref: 44382528
Scale: 1:5,000
Job No. 44382624
Drg Size: A3
FIGURE 3

# APPENDIX A –
# ANALYTICAL METHODOLGY

## APPENDIX A – VALIDATION ANALYTICAL SUITES

## LABORATORY REQUIREMENTS
## FOR SOILS AND GROUNDWATER VALIDATION ANALYSIS
## AREA 1, FORMER LLANDARCY REFINERY SITE, SOUTH WALES

### INTRODUCTION

This document sets out the requirements for analytical works for the contractor's testing of imported material. The project manager will also apply these standards when testing materials in accordance with the validation protocols documented in Section 5.0 of the Strategy.

This appendix is divided into the following sub-sections:

- General requirements, setting out the minimum requirements to be provided by the contractor as part of this submission, relating to laboratory analysis;

- Specific analytical requirements, based on the particular analytical suites that are required as part of this contract

- Details of the required asbestos analysis

### 1.0 GENERAL REQUIREMENTS

#### (1) General information

- Confirmation that the laboratory is UKAS accredited in all of the methodologies used to analyse the parameters set out in Section 2 and whether or not it is compliant to ISO17025 for those determinands that are on this UKAS schedule. Evidence of such accreditation should be provided for the methods listed.

- Details of which external accreditation programs the laboratory participates in, such as (but not necessarily limited to): CONTEST, LEAP, British Gas and Aquacheck,. Where any of these are applicable to any of the determinands listed in Section 2, the laboratory should

provide the results of the three most recent rounds of testing relating to such, identifying the approximate dates when such testing was carried out.

- All analyses and results for soils should be MCERTS accredited. Where this accreditation is not available then this should be stated in the contractors submission along with an explanation (no MCERTS accreditation exists for analysis or Lab Applying for accreditation etc). Where possible the lab should indicate whether an alternative method exists which is accredited under MCERTS. If an analysis is MCERTS accredited but the results are not reported as being compliant with the MCERTS standard then the laboratory will be expected to re-run the analysis to obtain an accredited result.

- Confirmation that the laboratory can, as a minimum, provide data electronically in AGS format. A copy of the precise format may be supplied on request. URS will expect to be able to rely equally on electronically reported data and "hard copy" results.

**(2) Quality deliverables**

The following QA/QC deliverables shall be required for each set of analyses conducted

- A trip blank to be included with each batch of samples for VOCS/BTEX;

- For VOCs, PAHs and heavy metals, a matrix spike/matrix spike duplicate to be included at a frequency prescribed by the quality control procedures associated with the method or within each batch of samples undergoing analysis (minimum frequency 1 in 20 samples);

- For all analyses, laboratory duplicates to be provided at a frequency as prescribed by the quality control procedures associated with the method concerned, or within each batch of 20 samples, whichever is the minimum;

- For all analyses, laboratory blanks to be provided at a frequency as prescribed by the quality control procedures associated with the method concerned, or within each batch of 20 samples, whichever is the minimum;

- Surrogate recovery data for all organic analyses (VOCs, BTEX and PAHs);

- Chromatograms for all hydrocarbon analyses as an essential deliverable (see section 2 for further details) and for other organics analyses on an ‘as needed’ basis

- Method Detection Limits and Method Reporting Limits (Quantitation limits) for each analysis undertaken (see below for definition) and dilution factor wherever applicable. The laboratory should indicate whether it is able to offer flagging of any data that fall between the MDL and MRL for organics and metals analysis;

- For all analyses, an accompanying estimate of bias and precision associated with the method concerned.

## 2.0 SPECIFIC ANALYSIS REQUIREMENTS

### (1) Schedule of determinands.

The schedule of determinands is as set out below, for both soil and groundwater, except where stated otherwise:

1. Total Petroleum Hydrocarbons (TPH)-as diesel range;
2. Total Petroleum Hydrocarbons (TPH)-as diesel range with aliphatic/aromatic split;
3. Gasoline range Petroleum hydrocarbons;
4. Gasoline range Petroleum hydrocarbons with aliphatic/aromatic split;
5. BTEX, MTBE, methylene chloride, and 1,2-dichloroethane;
6. Volatile Organic Compounds (VOCs);
7. Volatile Organic Compounds with Tentatively Identified compounds (TICs);
8. Polyaromatic hydrocarbons;
9. Heavy metals;
10. Total Organic Carbon;
11. NRA Leach tests

### (1) Total Petroleum Hydrocarbons (TPH)-as diesel range

Analysis should include for TPH C10 to C35, by GC/FID (or GC/MS) with C chain bands reported as:

>C10-C12
>C12-C16
>C16-C21
>C21-C35

based upon equivalent carbon number.

The method used will report hydrocarbons only and not associated breakdown products (i.e. N, S Os). It is essential that a legible gas chromatogram is provided with each analysis. In order to facilitate interpretation of these chromatograms, these should also include the depiction of where specific equivalent C numbers fall on the chromatogram trace (e.g. C10, C12, C16, C21)

at the same, or for additional cost. The detection limit for any given chain length fraction should be <25mg/kg in soils and <10µg/l in waters and totals should be <100mg/kg and <50µg/l.

**(2) Total Petroleum Hydrocarbons (TPH)-as diesel range with aliphatic/aromatic split**

This shall be as described for TPH with the same C-band breakdown with additional division into aliphatic and aromatic compounds for each band. Again the laboratory should confirm that the method used will report hydrocarbons only and not associated breakdown products (i.e. N, S Os). Detection limits should be as per (1)

**(3) Gasoline range Petroleum hydrocarbons (GRO)**

GRO should be offered as a combined package in combination with TPH diesel range, otherwise provide details for this as a stand alone analysis with the carbon banding:

>C5 – C7
>C7 – C8
>C8 – C10
>C10 – C12

Again this is based upon equivalent carbon number. As for TPH, provision of a gas chromatogram should be included as a deliverable. Detection limits as per (1) above.

**(4) Gasoline range Petroleum hydrocarbons with aliphatic/aromatic split**

This shall be as for Gasoline range petroleum hydrocarbons with the additional division into aliphatic and aromatic compounds for each band. Detection limits as per (1) above.

**(5) BTEX (optionally with MTBE, methylene chloride and 1,2-dichloroethane)**

Analysis should be for benzene, toluene, ethyl benzene, and the xylene isomers using purge and trap or headspace with analysis by GC/MS. Similarly, there has been some history of use of MTBE and specific VOCs, namely methylene chloride and 1,2-dichloroethane. Rather than undertaking a separate complete target VOCs analysis (see below), these should be added to the BTEX analysis. Detection limits should be <5µg/kg in soils and <5µg/l in waters.

**(6) Volatile Organic Compounds**

Analysis should be for 'target list ' VOCs using purge and trap or headspace with analysis by GC/MS. A list of target compounds should be provided for clarification purposes. Detection limits as per (5) above.

**(7) Volatile Organic Compounds with Tentatively Identified compounds**

The additional provision of including tentatively identified compounds with VOC analysis should be considered although may not be necessary with the requirement directed by URS. Detection limits as per (5) above.

**(8) Polyaromatic hydrocarbons**

Analysis should be for the 16 PAHs defined as priority pollutants by the USEPA, by GC/MS. Detection limits should be <0.1mg/kg in soils and <1µg/l in water.

**(9) Heavy metals**

Heavy metals should include As, Cd, Cr, Pb, Hg, Cu, Ni, V, Zn as the standard suite, with additional quotations for iron, manganese and other heavy metals. Analysis should be by AAS or ICP. Detection limits should be as indicated below;

| **Metal** | **Soil (mg/kg)** | **Water(µg/l)** |
|---|---|---|
| Arsenic | 0.05 | 1 |
| Cadmium | 0.5 | 0.5 |
| Chromium | 2 | 5 |
| Lead | 5 | 5 |
| Mercury | 0.05 | 0.1 |
| Copper | 1 | 5 |
| Nickel | 1 | 5 |
| Vanadium | 1 | 10 |
| Zinc | 2 | 5 |
| Iron | 10 | 50 |
| Manganese | 5 | 5 |

**(10) Total organic carbon (Soil)**

Analysis should be carried out preferably according to BS 1377, or other standard analytical method to be specified and agreed. Detection Limit in soil should be <0.1%

**(11) Leachable concentrations**

NRA leach tests may also be required. A rate for sample preparation should be provided.

## 3.0 ASBESTOS ANALYSIS REQUIREMENTS

### (1) Analysis Method

The analysis for asbestos in soil should provide an initial screening of the soils with a quantitative detection limit of <100ppb. Subsequent testing of the soil should be capable of providing quantified results to a detection limit of approximately 10ppb. The following provides an indication of the type of analysis required. The following techniques have previously been provided by the Institute of Occupational Medicine in Edinburgh for work undertaken at Llandarcy.

The analysis of asbestos in soils can be split into 3 parts depending on what the initial results show.

1. Initial bulk analysis. This involves the whole sample being spread out in a tray and examined visually for the presence of asbestos. Following initial examination, a sub sample is taken (for analysis following HSG 248) to either confirm the identity of any materials suspected of containing asbestos or to perform a more detailed examination for samples in which no asbestos was detected visually. This analysis provides a qualitative result only i.e. is asbestos present and if so what type. The limit of detection for this analysis is around 0.001% (10ppm).

2. Hand picking and weighing of asbestos containing materials. If any asbestos containing materials (ACM's) are visible when the sample is spread out in the tray they are picked out, dried and weighed. A percentage asbestos is assigned to each ACM with reference to MDHS 100 and the weight of asbestos likely to be present in these materials is expressed as a percentage of the total weight of the soil sample (dry weight). If the amount of asbestos comes to greater than the appropriate action level (0.1%, 0.001% etc. dependant on the reason for the analysis) the analysis may stop here.

3. Fibre counting, sizing and identification by PCOM. If asbestos is identified as being present but based on the results of stages 1 and 2 may be less than the relevant action level, a sub sample is made up in solution from which filters are prepared and analysed by phase

contrast optical microscopy. The limit of detection for this analysis is 0.0001% (1ppm). The limit of quantification for this technique is around 0.001% (10ppm).

4. Asbestos is not covered by the MCERTS standard. UKAS accreditation for the identification of asbestos in soils and bulk materials is required. The quantification analysis is a bespoke analysis and therefore not accredited by UKAS

# Appendix B - Neath Port Talbot Borough Council Correspondence

URS

Our Ref: 44382729

7 February 2008

Emma Jones
Neath Port Talbot Borough Council
Civic Centre
Neath
SA11 3QZ

Dear Emma

**Re: Remediation Works at Area 1, BP Oil Refinery, Llandarcy**
**Application 02/0143**

I write with reference to the approved remediation strategy for the Area 1 development works at the BP Llandarcy site. I have enclosed a copy of the strategy for your information.

The works on site are progressing well and the initial phase of the remediation to remove all the fill from the site has been substantially completed. The developer will soon be commencing works to excavate and remove the surplus soil from the site before reprofiling to achieve the formation levels. . As part of this reprofiling works, the developer is proposing to use approximately 6,000m3 of rock to be excavated from within the Area 1 site which will be crushed for re-use.

The remediation strategy includes a testing frequency for the various materials to be included within the permanent works. For site won crushed rock this is currently stated as being tested at a frequency of 1 per 25m3. The nature of this rock is a fractured sandstone material with low primary permeability. To date, only occasional and localised sheens have been observed on the groundwater emanating from this rock. In bulk, the hydrocarbon content of this material is expected to be low.

When the strategy was originally drafted, only small volumes of rock were anticipated to be re-used. Now that much larger volumes are anticipated, we expect a lesser frequency would be sufficiently representative of what will be a relatively homogenous material. Given this and the nature of the material, we are therefore proposing to reduce the frequency of testing to 1 per 200$m^3$. Please could you confirm whether this amendment to the current testing frequency would be acceptable to Neath Port Talbot Borough Council.

We would also like to propose an amendment to the testing frequency for imported fill material. This is currently stated as 1 per 500m3 for quarried material. We propose that this is amended to 1 sample per quarry source, each sample to be composite of five sub-samples. Again, please could you confirm whether this amendment to the current testing frequency would be acceptable to Neath Port Talbot Borough Council.

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BSI REGISTERED UKAS QUALITY MANAGEMENT 003
Certificate No. FS21618

I would appreciate your earliest response on this as, with the earthworks due to commence shortly, the testing regime will be key to informing the developer's earthworks strategy.

Please do not hesitate to contact me if you would like to discuss this further.

Yours sincerely
**URS Corporation Ltd**



Steve Coates
Associate Director

Encl.

- Llandarcy Refinery 'Area 1' Remediation Strategy, Memorandum dated 17th June 2006

"Emma Jones"
<e.k.jones@neath-porttalbot.gov.uk>
21/02/2008 15:52

To <Steve_Coates@URSCorp.com>
cc
bcc
Subject BP Llandarcy Remediation Works Area 1

History: This message has been replied to and forwarded.

Steve,

Further to your submission of information regarding validation testing at Area 1 and our recent telephone conversations. I would agree, your proposal to reduce testing frequency for rock and imported quarried material is acceptable.

If you require any further information, please contact me on the number below.

Regards

Emma

Emma Jones
Contaminated Land Officer
Neath Port Talbot County Borough Council
The Quays
Brunel Way
Baglan Energy Park
Neath

SA11 2GG

Tel: 01639 686521

Our Ref: 44382729/BRLT0007/SJC

11 April 2008

Emma Jones
Contaminated Land Officer
Neath Port Talbot County Borough Council
The Quays
Brunel Way
Baglan Energy Park
Neath SA11 2GG

**For the attention of Ms Emma Jones**

Dear Emma,

**Re: Request for revision to currently accepted RBSL for zinc at BP Llandarcy and acceptance of marginally elevated nickel concentrations**

Natural soils and bedrock are currently being excavated within the Area 1 development area to provide the necessary development platform. The works are being validated in accordance with the agreed Llandarcy Refinery 'Area 1' Remediation Strategy dated 17th June 2006 and the agreed amendment to the rock sampling frequency dated 7th February 2008, and therefore analytical results for the remaining natural soils and the re-used bedrock samples are being compared to the original RBSLs agreed with NPTCBC as reported in URS report (ref: Llandarcy Refinery Redevelopment, Detailed Human Health Risk Assessment, 44383634 Final Issue No 2, May 2005.

The original RBSL for zinc is 200 mg/kg and is based on the MAFF Soil Code value for agriculture. This value is not based on human health considerations and is consistent with the rationale presented in the RBSL report that the lower of the human health and soil code values would be considered for metals and metalloids if elevated natural background levels were not higher. Zinc was not a risk-driving substance in soil, and further consideration of local background levels therefore was not made.

The areas where excavation and validation testing have progressed to date are zones B to F and CS as indicated on the attached figure. Area A is the Lower Car Park and the unmarked areas have yet to be offered for validation. There is no evidence to suggest that the soil and bedrock should be affected with anthropogenic zinc contamination, yet we are encountering zinc concentrations above the soil code value of 200 mg/kg. In not wishing to needlessly dispose of such material where, other for the zinc concentrations, the validation criteria are passed, we are requesting that NPTCBC consider a revised zinc RBSL that better reflects both natural background levels and human health risk.

Using the same rationale agreed for the arsenic RBSL we have looked at the same BGS soil dataset for the Neath Port Talbot area. The range of zinc concentrations reported is 41-19047 mg/kg, with an average of 602 mg/kg. The agreed rationale for the arsenic RBSL was the use of the lower confidence limit of the mean (LCL) for the local background, given that the local average was higher than the SGV. The upper and lower confidence limits of the mean for zinc locally are 478 mg/kg and 727 mg/kg.

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Certificate No. FS21618

The range of zinc concentrations reported for the soil validation samples taken from the natural soil and bedrock is summarised below:

| Parameter | Zinc Concentrations (mg/kg) | |
|---|---|---|
| | Rock samples from earth works | Soil samples from validation trial pits |
| Minimum | 78 | 16 |
| Maximum | 330 | 4400 |
| Mean | 153 | 141 |
| No. of samples | 35 | 146 |
| Standard deviation | 59 | 373 |
| UCL | 172 | 201 |
| LCL | 133 | 80 |

Using the agreed Llandarcy risk assessment model, the proposed residential RBSL for zinc is 3280 mg/kg, based on the exposure assumptions outlined in the May 2005 Final report and the physchem and toxicological parameters appended.

Nine validation samples and six rock samples fail the original RBSL of 200 m/kg. Only four of these samples fail the background LCL of 478 mg/kg (all soil validation samples) and only one of these fails the proposed RBSL of 3280 mg/kg; with a reported concentration of 4400 mg/kg for VTP018. This localised area is to be excavated for the avoidance of doubt.

We would be grateful if you would indicate whether you can accept a revised zinc RBSL for human health of 3280 mg/kg and thereby accknowledge that the naturally occurring zinc concentrations encountered in soil and bedrock are acceptable within the context of the residential development at this site.

Secondly, in five of the soil validation samples to date we have encountered nickel concentrations slightly above the SGV of 50 mg/kg. A summary of these samples is provided below in addition to the statistics for local background nickel concentrations in surface soils, and the soil validation and rock sample dataset.

| Sample ID | Soil nickel concentration (mg/kg) |
|---|---|
| VTP013 | 51 |
| VTP018* | 53 |
| VTP204 | 57 |
| VTP124 | 55 |
| VTP082 | 51 |

*To be excavated and disposed of because of the elevated zinc concentration mentioned above.

| Parameter | Nickel Concentrations (mg/kg) | |
|---|---|---|
| | Rock samples from earth works | Soil samples from validation trial pits |
| Minimum | 24 | 11 |
| Maximum | 49 | 66 |
| Mean | 38 | 31 |
| No. of samples | 35 | 146 |

URS

| | | |
|---|---|---|
| Standard deviation | 7 | 10 |
| UCL | 40 | 32 |
| LCL | 35 | 29 |

The range of nickel concentrations reported in the BGS dataset for the local area is 8-349 mg/kg, with an average of 48 mg/kg. The upper and lower confidence limits of the mean for nickel locally are 44 mg/kg and 53 mg/kg.

In reviewing these values, we do not consider that the marginal exceedences of the nickel SGV in these few samples (3% of the total number analysed do far) are suggestive of unacceptable exposure and therefore justify remediation, and we would be grateful if you could indicate whether you are comfortable with and can accept this conclusion.

Three localised areas have been ear-marked for excavation in total as a result of the validation exercise to date; VTP018 highlighted above for elevated levels of zinc and lead, and VTP 019 and 026 for elevated arsenic concentrations.

The remainder of the site will progress to the validation stage within the next few months so we will keep you informed if any further anomalies in the data require further consideration.

We would appreciate your earliest response on this issue as it key to the progressing with the development of the site.

If you have any queries regarding this, please do not hesitate to contact the undersigned.

Yours sincerely
**URS Corporation Ltd**



Simon Cole
Technical Director – Human Health Risk Assessment UK & Ireland

Enc.

Llandarcy RBSL Summary Sheet for Zinc
Area 1 validation plan

"Emma Jones"
<e.k.jones@neath-porttalbot.gov.uk>
09/05/2008 08:05

To <Simon_Cole@URSCorp.com>
cc "Geoff Marquis" <g.marquis@neath-porttalbot.gov.uk>, <Steve_Coates@URSCorp.com>
bcc
Subject RE: Llandarcy Area 1 Validation - Zinc Exceedences

History: This message has been forwarded.

Thankyou Simon. I appreciate the problems you are encountering with the elevated natural background levels in this area and based on the additonal information submitted, I would agree with your approach and the revised Zinc RBSL for human health.

For our information, the site data set relating to Zinc and Nickel excedences will still be very useful to have but would also presume this information will be incorporated into the final validation report for the whole of Area 1.

Regards
Emma

---

**From:** Simon_Cole@URSCorp.com [mailto:Simon_Cole@URSCorp.com]
**Sent:** 07 May 2008 18:15
**To:** Emma Jones
**Cc:** Geoff Marquis; Steve_Coates@URSCorp.com
**Subject:** RE: Llandarcy Area 1 Validation - Zinc Exceedences

Emma,

I need to clarify the validation dataset with the people on site before I can confirm the number and characteristics of the validation samples that have zinc concentrations greater than the LCL background, but in terms of the rationale in the letter submitted, the aim is to establish the LCL background concentration of 478 mg/kg zinc as an overall quality target for the natural soils and rock as a whole, but recognise that within the natural variation we will encounter there will be infrequent more elevated results. We don't want to get into a situation whereby we need to excavate theoretical hotspots flagged by concentrations exceeding 478 mg/kg if in reality the elevated concentration is reflective of natural variation and clearly isn't a hotspot. The aim of the revised RBSL is to provide an upper threshold for those infrequent elevated results (i.e. above this RBSL we will look more closely at the location represented by that sample and re-sample/remediate if necessary).

With regard to the derivation of the revised RBSL, the assumptions used in the revision are provided in the RBSL summary sheet attached with the letter. The crux, as discussed, is the choice of TDI and MDI for zinc. In the previous RBSL derivation, no human health value was derived as elevated zinc was not considered to be likely to be an issue at this site. The RBSL was set at the MAFF soil code value based on phytotoxic considerations only.

When looking to derive a human health based generic assessment criteria for zinc there are a number of options available because no UK TDI has been published as yet. A highly precautionary option is to use a TDI of 500 ug/kgBW/day taken from RIVM and for which the safety factor used was endorsed by the EU, and also account for mean UK dietary intake. This value was set in 2001 and automatically accounts for dietary intake (i.e. in using this value you could defensibly set the MDI to zero). The 2003 UK report on safe limits for vitamins and minerals quotes an acceptable intake of 420 ug/kg/BW/day for supplemental zinc intake and 700 ug/kgBW/day if an upper limit of dietary intake is also included. It is also relevant to note that the health effect is decreased copper absorption which is not necessarily a significant adverse health effect at doses just above the thresholds mentioned. Back in 1982, JECFA proposed a PMTDI of 1 mg/kgBW/day, and this value is still referenced by WHO in their latest guidelines for drinking water in 2004.

If you use a TDI of 500 ug/kg BW/day and a UK average MDI of 8400 ug/day, the resultant RBSL using the existing Llandarcy model is 919 mg/kg.
If you use a TDI of 1 mg/kg BW /day and a UK average MDI of 8400 ug/day, the resultant RBSL is 3280 mg/kg.

These values also encompass a highly conservative estimate of zinc plant uptake into homegrown produce. It is reasonable to conclude that based on the high dietary intake of zinc, that including homegrown produce as well as a default dietary based MDI provides a degree of double counting.

If we use the TDI of 500 ug/kg BW/day and set MDI equal to zero (because the TDI already accounts for background intake) the resultant RBSL is 2100 mg/kg. Using the same assumptions and ignoring plant uptake makes the RBSL sky-rocket to 26,000 mg/kg.

Given the sensitivity of the zinc RBSL to plant uptake and the various options available in terms of TDI and MDI, we consider a reasonable combination to defining an upper acceptable limit to be the use of the JECFA PMTDI, average UK background and a conservative estimate of plant uptake, given that we are intending to use this RBSL to flag potential hotspots and intend to use it in combination with the LCL background value as the primary target value for the validation data.

I hope this makes sense! Please don't hesitate to call me if you have any further queries and I'll get back to you with the explanation of the site data later this week. I'll also provide further information on the marginal nickel exceedences we have identified.

Kind regards

Simon

Dr Simon Cole
Technical Director - Human Health Risk Assessment UK & Ireland
URS Corporation Ltd
Direct Tel: 029 2066 2373
Switchboard: 029 2046 5960
Mobile: 07881 827534
www.urscorp.eu

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URS Corporation Limited
Place of registration: Scotland
Registered number: 118271
Registered office: 243 West George Street, Glasgow G2 4QE

" height="16">"Emma Jones" <e.k.jones@neath-porttalbot.gov.uk>

**"Emma Jones" <e.k.jones@neath-porttalbot.gov.uk>**

07/05/2008 12:18

To<Simon_Cole@URSCorp.com>

cc"Geoff Marquis" <g.marquis@neath-porttalbot.gov.uk>

SubjectRE: Llandarcy Area 1 Validation - Zinc Exceedences

Simon,

In previous correspondence we have agreed the rationale for the arsenic RBSL using the lower confidence limit of the mean for the local background. I am a little confused with the information provided, as the lower confidence limit for zinc using the same dataset and rationale is 478 mg/kg of which none of the validation samples exceed within the table provided. However, your letter report then outlines a new RBSL for zinc as 3280 mg/kg (using the previously agreed Llandarcy Risk Assessment Model) and states a number of exceedences that are not outlined in the previous table. As we discussed earlier on the phone could you please clarify this information, and explain what different information has been used within the risk assesment model to derive this RBSL.

With regard to the nickel concentrations - I would agree with your approach and would not consider the marginal exceedences are suggestive of unacceptable exposure.

Look forward to hearing from you.

Regards
Emma

---

**From:** Simon_Cole@URSCorp.com [mailto:Simon_Cole@URSCorp.com]
**Sent:** 01 May 2008 09:55
**To:** Emma Jones
**Subject:** RE: Llandarcy Area 1 Validation

Thanks Emma

Simon

" height="16">"Emma Jones" <e.k.jones@neath-porttalbot.gov.uk>

| | |
|---|---|
| **"Emma Jones" <e.k.jones@neath-porttalbot.gov.uk>** | To<Simon_Cole@URSCorp.com> |
| 30/04/2008 08:53 | cc |
| | SubjeRE: Llandarcy Area 1 ctValidation |

Hi Simon,

Apologies for the delayed response on this - I have been off work last week and have not had a chance to look at it yet. Its unlikely i will be able to get a reply to you until end of next week as I am also off the rest of this week.

Regards
Emma

---

**From:** Simon_Cole@URSCorp.com [mailto:Simon_Cole@URSCorp.com]
**Sent:** 28 April 2008 10:19
**To:** Emma Jones
**Subject:** RE: Llandarcy Area 1 Validation

Hi Emma,

Can you give me an idea as to when you'll be able to respond to this and I can then let those concerned know what the anticipated time scale is?

Thanks

Simon

Technical Director - Human Health Risk Assessment UK & Ireland
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URS Corporation Limited
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" height="16">"Emma Jones" <e.k.jones@neath-porttalbot.gov.uk>

To<Simon_Cole@
URSCorp.com>

cc

SubRE: Llandarcy
jectArea 1
Validation

Thankyou Simon, will get back to you.

Regards
Emma

---

**From:** Simon_Cole@URSCorp.com [mailto:Simon_Cole@URSCorp.com]
**Sent:** 11 April 2008 12:13
**To:** Emma Jones
**Cc:** Steve_Coates@URSCorp.com

**Subject:** Llandarcy Area 1 Validation

Emma, hi. Hope you are well. I've attached a letter which requests your acceptance of an amended approach to the assessment of elevated nickel and zinc concentrations that have been detected in natural soil and bedrock as part of the remediation validation exercise at Area 1. Such concentrations exceed the agreed RBSLs, but we do not believe they are of undue concern.

Your prompt response would be welcomed, as always! If you have any queries regarding the details of the letter, please don't hesitate to contact me.

I've attached a summary physchem and tox sheet for the revised zinc RBSL. The exposure model used is that already agreed for Llandarcy and used for all the previous RBSLs. I've also attached a Figure, that although related to PID results, does show the areas and validation points mentioned in the letter.

Kind regards

Simon

*(See attached file: Area1_PID_walkover_map_26_1_08.pdf)(See attached file: BRLT0007 Llandarcy Area 1 Zinc RBSL & Nickel_as issued.pdf)(See attached file: RBSL template -Zinc.doc)*

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URS Corporation Limited
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Registered number: 118271
Registered office: 243 West George Street, Glasgow G2 4QE

Our Ref: 44382729/BRLT0009/DJD

25 February 2009

Emma Jones
Contaminated Land Officer
Neath Port Talbot County Borough Council
The Quays
Brunel Way
Baglan Energy Park
Neath SA11 2GG

**For the attention of Ms Emma Jones**

Dear Emma,

**Re: Request for acceptance of marginal chemical exceedances in soils at BP Llandarcy**

This letter relates to the validation of the remaining natural soils encountered in the Phase 2 works at Area 1, Llandarcy Refinery.

Natural soils and bedrock are being excavated as part of the Area 1 development to provide the necessary development platform. For programming, the remediation and development works, was split into two areas, Phase 1 to the east and Phase 2 to the west.

The works are being validated in accordance with the agreed Llandarcy Refinery 'Area 1' Remediation Strategy dated 17th June 2006 and the agreed amendment to the rock sampling frequency dated 7th February 2008. Analytical results for the remaining samples taken from natural soils and re-used bedrock have therefore been compared to the original RBSLs agreed with NPTCBC, as reported in the URS report 'Llandarcy Refinery Redevelopment, Detailed Human Health Risk Assessment, 44383634 Final Issue No 2, May 2005'.

Since the derivation of the original RBSLs, revised zinc RBSL of 3,280mg/kg was agreed to prevent the unnecessary excavation and off-site disposal of soils with natural zinc content in excess of the RBSL as it was not considered that observed zinc concentrations posed unacceptable risks to human health.

During validation of the Phase 1 works, marginal exceedances of the nickel SGV were also passed by NPTCBC as acceptable. It was considered that the very small proportion of exceedances would not pose an unacceptable risk based on average exposure. Consideration that the average site nickel concentration and range of reported validation values on site were below the regional background values was also taken into account.

The purpose of this letter this letter is to gain your agreement that the marginal exceedances identified in Phase 2 of the validation works are acceptable. The justification for this request follows the same principles presented in April 2008 in relation to marginal nickel exceedances. (Reference – URS letter BRLT0007 to NPTCBC dated 11th April 2008 and our subsequent email communication).

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During Phase 2 validation works, there were 30 samples that marginally exceeded the RBSLs for copper, lead, nickel and/ or benzo(a)pyrene. Two of these samples were taken from stockpiles natural material to be re-used as a part of the development earthworks.

Samples exceeding the RBSLs are widely distributed across the validation area. Visual observations recorded during site works suggest that generally similar silty sandy gravel material was encountered at these locations. Analytical data for the marginal exceedances locations are presented in Table A (attached)

Based on the results of the Phase 2 works, ten sampling locations have been selected for further excavation based on aesthetic criteria failures. An additional nine locations have been earmarked for further excavation based on chemical validation failures. These locations are listed in Table 1 below.

**Table 1**

| Sample I.D. | Depth (m) | Rationale |
|---|---|---|
| TP068 | 0.5 | Aesthetics |
| TP080 | 0.1 | |
| TP151 | 0.1 | |
| TP172 | 0.1 | |
| TP122 | 1.0 | |
| TP164 | 0.1 | |
| TP189 | 0.7 | |
| TP211 | 0.1 | |
| | 0.7 | |
| | 1.4 | |
| | 2.9 | |
| TP212 | 0.8 | |
| TP213 | 2 | |
| CE04 | 1.0 | B(a)P = 10mg/kg |
| TP048 | 0.1 | Pb = 2,500mg/kg |
| TP120 | 0.1 | Cd = 34mg/kg |
| TP133 | 0.1 | Pb = 630mg/kg |
| TP151 | 0.1 | Aesthetics |
| TP154 | 0.1 | Hg = 13mg/kg, aesthetics |
| TP183 | 0.1 | Zn = 5,400mg/kg |
| TP196 | 0.1 | As = 110mg/kg, Pb = 1,300mg/kg, Zn = 5,600mg/kg |
| | 0.7 | As = 350mg/kg, Pb = 2,500mg/kg, Zn = 7,200mg/kg |
| | 1.4 | As = 66mg/kg, Pb = 930mg/kg |
| | 2.1 | Pb = 870mg/kg, Zn = 3,300mg/kg |
| TP208 | 0.1 | Pb = 710mg/kg, B(a) = 1.3 mg/kg |
| | 0.7 | Pb = 690mg/kg |

Figure 1 (attached) presents the locations identified for further excavation and locations of marginal chemical exceedances across the validation area. We propose that soils where marginal exceedances have been identified remain in-situ as it is considered that although the values are above the RBSLs, these values represent a minimal and acceptable risk to human health within the site context.

In support of this suggest approach, a basic statistical summary of analyte concentrations reported for the soil validation and stockpile samples (excluding those reported in Table 1 above) has been summarised in Table 2 below.

**Table 2**

| Parameter | Analyte | | | | |
|---|---|---|---|---|---|
| | Copper | Lead | Nickel | B(a)P | |
| RBSL (mg/kg) | 478 | 337 | 50 | 0.9 | |
| Minimum (mg/kg) | 6.3 | ND | 8.2 | ND | |
| Maximum (mg/kg) | 720 | 430 | 93 | 4.7 | |
| Mean (mg/kg) | 51.4 | 54.3 | 33.9 | 0.155 | |
| No. of samples | 255 | 255 | 255 | 270 | |
| No. of non-detects (ND) | 0 | 4 | 0 | 263 | |
| No. of exceedences | 2 | 3 | 26 | 7 | |
| % Exceedances | 0.8 | 1.2 | 10.2 | 2.6 | |
| Standard deviation (mg/kg) | 71.1 | 67.5 | 13.0 | 0.385 | |
| Sample data distribution | Non-parametric | Non-parametric | Log-normal | Normal, lognormal or gamma without NDs | |
| Upper 95$^{th}$ confidence limit on the mean (UCL) (mg/kg) | 70.8 | 61.5 | 35.4 | 0.19 | 0.15 |
| Statistical basis for UCL | Chebyshev | KM (BCA) | H-statistic | BCA Bootstrap | DL/2 Students-t |

These values have been calculated using the USEPA ProUCL4.0 statistical software, which has the advantage of recommending a UCL appropriate to the identifiable data distribution. The aim of this statistical analysis is to enable a comparison with background data, and should not be viewed as a detailed statistical analysis undertaken for specific averaging areas akin to the approach promoted by the CIEH/CL:AIRE guidance.

Table 3 presents the range of values for metals in local soils as reported by the BGS dataset. For B(a)P, an indication of the average urban soil concentrations is presented based on the Environment Agency's soil and herbage survey carried out for the UK and NI.

**Table 3**

| Parameter | BGS Local Background Concentration (mg/kg) | | | EA Urban Soil Concentration (mg/kg) | |
|---|---|---|---|---|---|
| | Copper | Lead | Nickel | B(a)P Wales | B(a)P UK & NI |
| Minimum | 7 | 20 | 8 | 0.1 | 0.016 |
| Maximum | 1,447 | 14,714 | 349 | 1.0 | 31 |
| Mean | 161.2 | 430.6 | 48.5 | 0.5 | 0.9 |
| No. of samples | 375 | 375 | 375 | 9 | 87 |
| Standard deviation | 172 | 924 | 41 | 0.3 | 3.4 |
| LCL | 144 | 337 | 44.3 | 0.3 | 0.2 |
| UCL | 179 | 524 | 52.6 | 0.7 | 1.6 |

Based on the information presented in Tables 2 and 3, the ranges of copper, lead and nickel concentrations taken from the site validation samples are within the range of concentrations expected in local background soils. In addition, the 95% UCLs of the datasets are lower than their respective RBSLs. There is no compelling case that these results don't simply reflect the variability in the material composition, such that the 95% UCL is a reasonable and conservative representation of typical soil quality in this validation area.

To further support our suggested approach, consideration can also be given to the following:

**Metals:**

- Lead concentrations are below the SGV of 450 mg/kg (as summarised in Table 2)
- The RBSL was set on the basis of the background LCL in accordance with the original RBSL methodology, which incorporated phytotoxic considerations as well as human health.
- No human health-based RBSL was originally presented for copper due to its low toxicity. The maximum reported copper concentration is 720 mg/kg. Typically human health-based generic screening values for copper are an order of magnitude higher.

**Benzo(a)pyrene**

- There were only nine marginal B(a)P exceedances identified across the site. Results do not indicate a specific zone with elevated B(a)P concentrations. Five of the B(a)P exceedances were in the surface samples (0.1 mbgl) and the other 4 were within shallow soil at ⩽1m bgl)
- For all soil samples with identified B(a)P exceedances, subsequent depths did not contain B(a)P at a concentration in excess of the MDL of 0.1mg/kg.
- Visual evidence of specifically different material was not noted at any of the locations therefore it is considered that reported concentrations are not likely to represent significant volumes of soil but more likely is characterised by the inherent variability in the soil at a much smaller scale.

A measure of the average concentration is considered to be a more reasonable method for assessing the significance of the B(a)P concentrations detected. The 95% UCL of 0.19mg/kg is below the RBSL of 0.9mg/kg. The maximum B(a)P concentration was 4.7 mg/kg, and in the context of the data analysis presented, the reported concentrations pose only a minimal and an acceptable risk to human health.

We believe it is reasonable to conclude that the reported concentrations marginally above the RBSLs are not likely to pose an unacceptable risk to human health. We would be grateful if you would indicate whether you are willing to accept these lines of evidence as sufficient justification for our proposals to leave in-situ the marginal exceedances described above. We would appreciate your earliest response on this issue as it key to progressing with the development of the site.

For your additional information the full Phase 2 validation dataset (including Dawnus cabins stockpile samples) is attached. The validation process is at/near completion/has X further stages to complete and we will keep you informed if any further anomalies in the data require further consideration.

URS

If you have any queries regarding this, please do not hesitate to contact the undersigned.

Yours sincerely

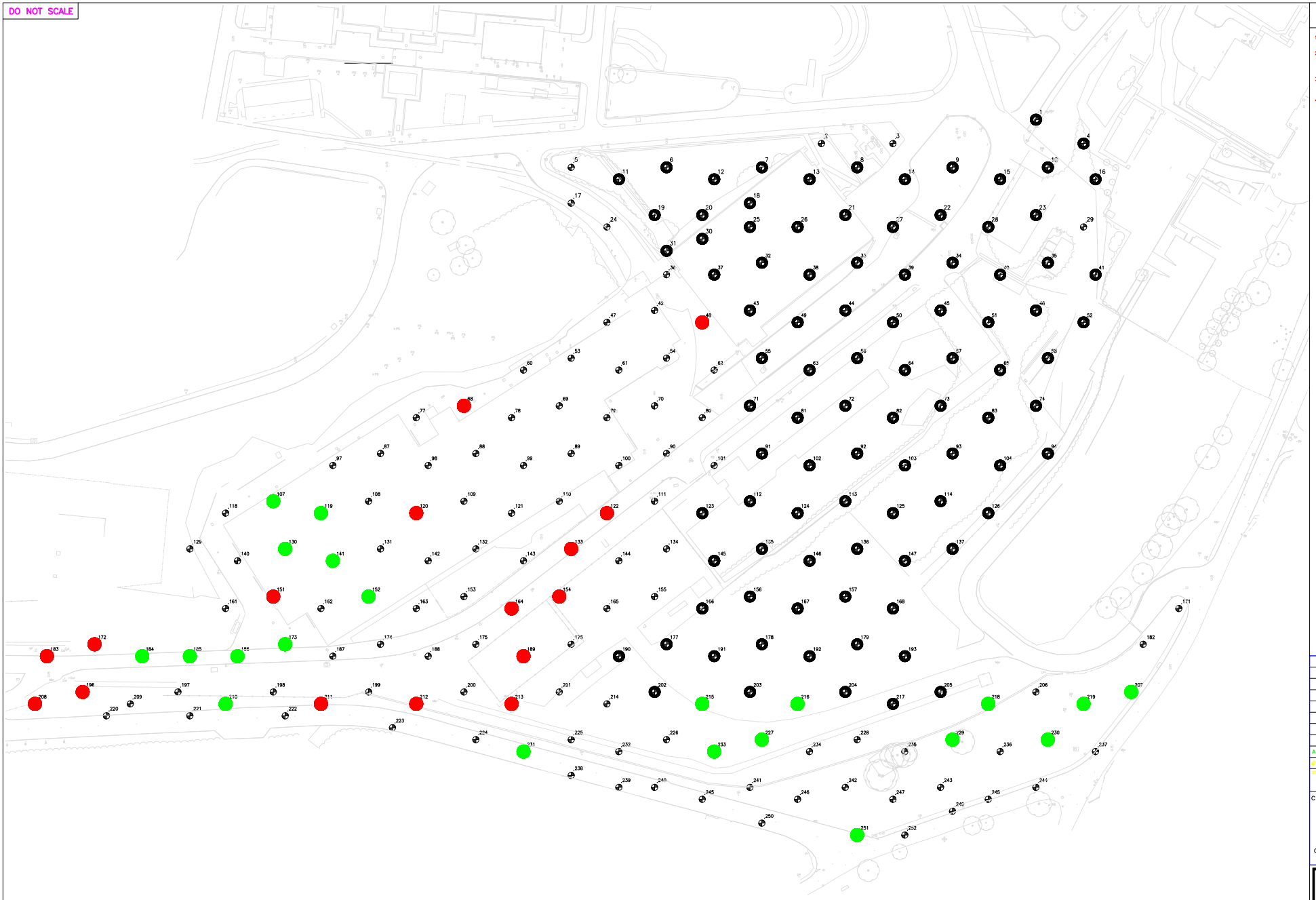


Simon Cole
Technical Director – Human Health Risk Assessment UK & Ireland
**URS Corporation Ltd**

Enc.

Table A: Soil Locations with Marginal RBSL Exceedances Requiring approval to remain in Situ
Figure 1: Area 1 Phase 2 validation plan
Table B: Area 1 Phase 2 validation data

DO NOT SCALE




## NOTES

1. REMEDIATION BOUNDARY BASED ON ROBERT ADAMS ARCHITECTS DRAWING RECEIVED BY E-MAIL ON 11.06.06.
2. VALIDATION SAMPLING AND TESTING TO BE IN ACCORDANCE WITH PROTOCOLS SET IN PERFORMANCE SPECIFICATION FOR REMEDIATION CONTRACT, 44382624. ISSUE 2 FINAL DATED 27.7.06.
3. CONTRACTOR TO NOTIFY AND AGREE SUPERVISOR IN ADVANCE IF ANY LOCATIONS ARE TO BE ALTERED FROM THOSE SHOWN.
4. CONTRACTOR TO PROVIDE SURVEY CO-ORDINATES FOR ACTUAL LOCATIONS SAMPLED.

KEY

LOWER CAR PARK– VALIDATION TRIAL PITTING NOT REQUIRED.

PHASE II UNVALIDATED (AWAITING EARTHWORKS).

VALIDATED AREA

EXCEEDENCES OF VALIDATION CRITERIA EXCAVATED. SUBSEQUENT TESTING REPORTED CONCENTRATION WITHIN VALIDATION CRITERIA.

VALIDATED– NO OUTSTANDING ISSUES.

MARGINAL CHEMICAL EXCEEDENCES FOR Cu, Pb, B(a)P OR Ni FOR WHICH ACCEPTANCE WITHOUT EXCAVATION IS BEING SOUGHT

LOCATIONS FOR FURTHER EXCAVATION

| | | | | |
|---|---|---|---|---|
| A | HIGHLIGHTED LOCATIONS ADDED | LCH | LW | 04.03.09 |
| B | EXCEPTED | LCH | LW | 04.03.09 |

STATUS: INFORMATION

CONSULTING ENGINEERS
URS
COMPANY HOUSE, TOWER HILL, BRISTOL. BS2 0EQ.
TEL 0117–3178500 FAX 0117–3178549

CLIENT: BP LLANDARCY

PROJECT: LLANDARCY REFINERY
AREA 1

DRAWING TITLE: AREA 1 PHASE II VALIDATION PLAN

| DESIGNED | DRAWN | CHECKED | APPROVED | DATE |
|---|---|---|---|---|
| LCH | LCH | LW | LW | 04.03.09 |

SCALE: AS SHOWN | JOB No.: 44382624/0015 | REV: A

ORIGINAL DRAWING A0

CAD drawing plotted on 14th Oct, 2008 at 12:42 by JOSU_MURILLO

**TABLE A:** Soil locations with marginal RBSL exceedances requiring approval to remain in situ.

| Location | Depth | ARSENIC | CADMIUM | CHROMIUM | COPPER | LEAD | MERCURY | NICKEL | SELENIUM | VANADIUM | ZINC | BENZO(A)PYRENE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **RBSL** | | 64 | 3.6 | 130 | 478 | 337 | 1 | 50 | 3 | 416 | 3280 | 0.9 |
| **TP053** | 0.1 | 13 | 0.87 | 17 | 51 | 320 | -1 | 24 | -1 | 17 | 520 | *2.7* |
| **TP089** | 0.1 | 12 | -1 | 21 | 46 | 180 | -1 | 38 | -1 | 20 | 210 | 1.8 |
| **TP107** | 0.1 | 45 | 1.4 | 32 | *720* | *410* | 0.6 | 39 | 0.42 | 28 | 830 | -1 |
| **TP119** | 0.1 | 16 | -1 | 16 | 44 | 46 | -1 | *64* | -1 | 19 | 130 | -1 |
| **TP130** | 0.1 | 35 | 0.99 | 27 | 260 | *400* | 0.71 | 43 | 0.43 | 30 | 720 | -1 |
| **TP134** | 0.1 | 12 | -1 | 13 | 26 | 19 | -1 | 16 | 0.64 | 22 | 160 | -1 |
| | 0.7 | 21 | -1 | 15 | 62 | 45 | -1 | 18 | 0.69 | 26 | 150 | *4.7* |
| | 1.4 | 10 | -1 | 11 | 24 | 19 | -1 | 30 | -1 | 17 | 88 | -1 |
| **TP141** | 0.1 | 12 | -1 | 18 | 33 | 51 | -1 | *51* | -1 | 19 | 130 | -1 |
| **TP152** | 0.1 | 7.8 | -1 | 18 | 22 | 31 | -1 | 40 | -1 | 20 | 96 | -1 |
| | 0.7 | 10 | -1 | 19 | 37 | 49 | -1 | *53* | -1 | 23 | 890 | *2.5* |
| **TP162** | 0.1 | 10 | -1 | 16 | 33 | 24 | 0.35 | *55* | -1 | 19 | 120 | -1 |
| **TP171** | 0.1 | 9.9 | -1 | 44 | 47 | 41 | -1 | 27 | 0.33 | 40 | 150 | *1.5* |
| **TP172** | 0.1 | 3.7 | -1 | 21 | 36 | 34 | -1 | *50* | -1 | 24 | 130 | -1 |
| **TP173** | 0.1 | 40 | 1.1 | 44 | *640* | 250 | 0.3 | *58* | 0.63 | 110 | 790 | -1 |
| | 0.7 | 20 | 0.59 | 23 | 260 | 190 | -1 | 40 | 0.33 | 26 | 1100 | -1 |
| | 1.4 | 6.3 | -1 | 18 | 31 | 23 | -1 | 49 | -1 | 19 | 94 | -1 |
| **TP184** | 0.1 | 25 | 0.56 | 17 | 340 | 97 | -1 | *56* | 0.37 | 26 | 440 | -1 |
| | 0.7 | 8.3 | -1 | 19 | 89 | 43 | -1 | 42 | 0.33 | 22 | 140 | -1 |
| | 1.4 | 15 | -1 | 9 | 93 | 76 | -1 | *51* | 0.34 | 20 | 210 | -1 |
| | 2.1 | 15 | -1 | 17 | 310 | 49 | -1 | 48 | 0.31 | 23 | 170 | -1 |
| **TP185** | 0.7 | 11 | -1 | 18 | 45 | 34 | -1 | *53* | -1 | 23 | 110 | -1 |
| | 1.4 | 14 | 0.55 | 21 | 48 | 30 | -1 | *64* | -1 | 30 | 200 | -1 |
| | 2.1 | 8.8 | -1 | 20 | 49 | 28 | -1 | *63* | -1 | 20 | 260 | -1 |
| **TP186** | 0.1 | 3.4 | -1 | 18 | 42 | 29 | -1 | *93* | -1 | 20 | 150 | -1 |
| | 0.7 | 10 | -1 | 19 | 39 | 32 | -1 | *62* | -1 | 19 | 120 | -1 |
| **TP207** | 0.1 | 4.6 | -1 | 17 | 23 | 17 | -1 | 42 | 0.5 | 19 | 66 | -1 |
| | 0.7 | 5.3 | -1 | 18 | 28 | 25 | -1 | *59* | 0.34 | 21 | 82 | -1 |
| **TP210** | 0.1 | 36 | 0.7 | 18 | 190 | *430* | -1 | 29 | 0.42 | 23 | 890 | -1 |
| | 0.7 | 30 | 0.74 | 18 | 200 | 330 | -1 | 32 | 0.46 | 24 | 950 | -1 |
| **TP215** | 0.1 | 10 | -1 | 15 | 38 | 41 | -1 | *50* | 0.42 | 28 | 120 | -1 |
| | 0.7 | 5.9 | -1 | 12 | 14 | 25 | -1 | 42 | -1 | 22 | 120 | -1 |
| **TP216** | 0.1 | 6.7 | -1 | 22 | 32 | 180 | -1 | *70* | -1 | 27 | 160 | -1 |
| **TP218** | 0.1 | 20 | 0.52 | 17 | 78 | 84 | -1 | 33 | 0.45 | 24 | 170 | *1.3* |
| | 0.7 | 6.5 | -1 | 21 | 35 | 23 | -1 | *51* | -1 | 24 | 97 | -1 |
| | 1.4 | 6.6 | -1 | 21 | 36 | 25 | -1 | *67* | -1 | 27 | 110 | -1 |
| **TP219** | 0.1 | 16 | -1 | 19 | 54 | 55 | -1 | 37 | 0.37 | 22 | 130 | -1 |
| | 0.7 | 12 | -1 | 18 | 42 | 50 | -1 | *69* | 0.44 | 34 | 110 | -1 |
| **TP227** | 0.1 | 6.2 | -1 | 17 | 22 | 17 | -1 | 41 | 0.3 | 22 | 100 | -1 |
| | 0.7 | 5.9 | -1 | 18 | 23 | 15 | -1 | *50* | -1 | 27 | 94 | -1 |
| | 1.4 | 5.5 | -1 | 17 | 23 | 16 | -1 | *53* | -1 | 21 | 86 | -1 |
| | 2.1 | 4.7 | -1 | 16 | 18 | 12 | -1 | 44 | -1 | 19 | 83 | -1 |
| **TP229** | 0.1 | 8.8 | -1 | 14 | 19 | 20 | -1 | 17 | 0.35 | 23 | 60 | -1 |
| | 0.7 | 5.9 | -1 | 18 | 23 | 17 | -1 | 46 | 0.38 | 19 | 83 | -1 |
| | 1.4 | 5.3 | -1 | 19 | 31 | 22 | -1 | *63* | -1 | 21 | 94 | -1 |
| | 2.1 | 3.2 | -1 | 13 | 8.3 | 13 | -1 | 32 | -1 | 13 | 61 | -1 |
| | 2.8 | 4.7 | -1 | 13 | 12 | 17 | -1 | 41 | -1 | 19 | 69 | -1 |
| **TP230** | 0.1 | 5.9 | -1 | 20 | 30 | 21 | -1 | *57* | -1 | 22 | 94 | -1 |
| **TP231** | 0.1 | 9.3 | -1 | 11 | 18 | 13 | -1 | 25 | -1 | 16 | 70 | -1 |
| | 0.7 | 5.1 | -1 | 53 | 11 | 15 | -1 | *69* | -1 | 27 | 83 | -1 |
| **TP233** | 0.1 | 43 | 0.53 | 18 | 83 | 44 | -1 | 33 | 0.8 | 24 | 140 | -1 |
| | 0.7 | 23 | 0.52 | 24 | 73 | 32 | -1 | 47 | 0.37 | 28 | 120 | -1 |
| | 1.4 | 9.7 | -1 | 18 | 36 | 22 | -1 | *59* | 0.3 | 28 | 110 | -1 |
| | 2.1 | 7.9 | -1 | 19 | 27 | 14 | -1 | *58* | -1 | 26 | 90 | -1 |
| **TP250** | 0.1 | 10 | -1 | 15 | 32 | 56 | -1 | 26 | 0.54 | 21 | 150 | *1.2* |
| **TP251** | 0.1 | 5.5 | -1 | 17 | 28 | 23 | -1 | *50* | -1 | 23 | 97 | -1 |
| **Stockpile Samples** | | | | | | | | | | | | |
| **SPCE11** | 1 | 14 | -1 | 17 | 96 | 47 | 0.34 | *73* | 0.45 | 22 | 130 | -1 |
| **SPCE13** | 1 | *5.2* | -1 | *19* | 50 | 54 | -1 | *57* | 0.3 | *25* | 140 | -1 |

Minus one indicates a value below the method detection limit

TABLE B: Area 1 Phase 2 Validation Analytical Data

| fk_location | Depth | A_1_1_1_2_TETRACHLOROETHANE | A_1_1_1_TRICHLOROETHANE | A_1_1_2_2_TETRACHLOROETHANE | A_1_1_2_TRICHLOROETHANE | A_1_1_DICHLOROETHANE | A_1_1_DICHLOROETHENE | A_1_1_DICHLOROPROPENE | A_1_2_3_TRICHLOROBENZENE | A_1_2_3_TRICHLOROPROPANE | A_1_2_4_TRICHLOROBENZENE | A_1_2_4_TRIMETHYLBENZENE | A_1_2_DIBROMO_3_CHLOROPROPAN | A_1_2_DIBROMOETHANE | A_1_2_DICHLOROBENZENE | A_1_2_DICHLOROETHANE | A_1_2_DICHLOROPROPANE | A_1_3_5_TRIMETHYLBENZENE | A_1_3_DICHLOROBENZENE | A_1_3_DICHLOROPROPANE | A_1_4_DICHLOROBENZENE | A_2_2_DICHLOROPROPANE | A_2_CHLOROTOLUENE | A_2_FLUOROBIPHENYL | A_4_BROMOFLUOROBENZENE | A_4_CHLOROTOLUENE | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | ARSENIC | BENZENE | BENZO_A_ANTHRACENE | BENZO_A_PYRENE | BENZO_B_FLUORANTHENE | BENZO_G_H_I_PERYLENE | BENZO_K_FLUORANTHENE | BORON | BROMOBENZENE | BROMOCHLOROMETHANE | BROMODICHLOROMETHANE | BROMOFORM | BROMOMETHANE | CARBON_TETRACHLORIDE | CHLOROBENZENE | CHLOROETHANE | CHLOROFORM | CHLOROMETHANE | CHRYSENE | CIS_1_2_DICHLOROETHENE | CIS_1_3_DICHLOROPROPENE | DIBENZ_A_H_ANTHRACENE | DIBROMOCHLOROMETHANE | DIBROMOFLUOROMETHANE | DIBROMOMETHANE | DICHLORODIFLUOROMETHANE | DICHLOROMETHANE | ETHYLBENZENE | FLUORANTHENE | FLUORENE | HEXACHLOROBUTADIENE | INDENO_1_2_3_CD_PYRENE | IRON | ISOPROPYLBENZENE | M_P_XYLENE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CE04 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 53 | 100 | ND | 2.7 | ND | 2.6 | 16 | ND | 9.4 | 10 | 15 | 5.5 | 5.5 | 1.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 10 | ND | ND | 1.8 | ND | 97 | ND | ND | ND | ND | 16 | 2.1 | ND | 6.6 | 29000 | ND | ND |
| CE05 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 50 | 100 | ND | ND | ND | ND | 18 | ND | ND | ND | ND | ND | ND | 0.71 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.0069 | ND | ND | ND | ND | ND | 35000 | ND | ND |
| CE06B | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 74 | 100 | ND | ND | ND | ND | 8 | ND | ND | ND | ND | ND | ND | 0.46 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | ND | ND | ND | ND | ND | ND | 40000 | ND | ND |
| CE06N | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 82 | 100 | ND | ND | ND | ND | 9.2 | ND | ND | ND | ND | ND | ND | 0.41 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | ND | ND | ND | ND | ND | 47000 | ND | ND |
| CE06S | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 45 | 100 | ND | ND | ND | ND | 37 | ND | ND | ND | ND | ND | ND | 0.72 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| CE07 | 3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 43 | 100 | ND | ND | ND | ND | 9.6 | ND | ND | ND | ND | ND | ND | 0.47 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| CE08 | 3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 70 | 98 | ND | ND | ND | ND | 8.3 | ND | ND | ND | ND | ND | ND | 0.95 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 55000 | ND | ND |
| CE09 | 3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 52 | 110 | ND | ND | ND | ND | 9.7 | ND | ND | ND | ND | ND | ND | 0.34 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 39000 | ND | ND |
| CE10 | 3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 42 | 100 | ND | ND | ND | ND | 7.1 | ND | ND | ND | ND | ND | ND | 0.42 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 93 | ND | ND | ND | ND | ND | ND | ND | ND | 32000 | ND | ND |
| CEO1N | 0.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 70 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | ND | ND | ND | ND | ND | ND | 32000 | ND | ND |
| CEO1S | 0.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 70 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| CEO2N | 1.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 73 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 36000 | ND | ND |
| CEO2S | 1.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 74 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 39000 | ND | ND |
| CEO3 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 56 | 95 | ND | ND | ND | ND | 7 | ND | ND | ND | ND | ND | ND | 0.43 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 32000 | ND | ND |
| MS189 | 1.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 60 | 96 | ND | ND | ND | ND | 9.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 53000 | ND | ND |
| SPCE01 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 70 | 92 | ND | ND | ND | ND | 56 | ND | ND | ND | ND | ND | ND | 0.67 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.012 | ND | ND | ND | ND | ND | 29000 | ND | ND |
| SPCE01D | 2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 53 | 90 | ND | ND | ND | ND | 41 | ND | ND | ND | ND | ND | ND | 0.47 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.0099 | ND | ND | ND | ND | ND | 32000 | ND | ND |
| SPCE02 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 74 | 93 | ND | ND | ND | ND | 38 | ND | ND | ND | ND | ND | ND | 0.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.0063 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| SPCE02D | 2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 64 | 91 | ND | ND | ND | ND | 43 | ND | ND | ND | ND | ND | ND | 0.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.0095 | ND | ND | ND | ND | ND | 35000 | ND | ND |
| SPCE03 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 83 | 91 | ND | ND | ND | ND | 45 | ND | ND | ND | ND | ND | ND | 0.61 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.007 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| SPCE03D | 2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 66 | 97 | ND | ND | ND | ND | 36 | ND | ND | ND | ND | ND | ND | 0.37 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| SPCE04 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 75 | 89 | ND | ND | ND | ND | 10 | ND | ND | ND | ND | ND | ND | 0.38 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.012 | ND | ND | ND | ND | ND | 31000 | ND | ND |
| SPCE05 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 58 | 91 | ND | ND | ND | ND | 7.9 | ND | ND | ND | ND | ND | ND | 0.52 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.01 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| SPCE06 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 63 | 91 | ND | ND | ND | ND | 7 | ND | ND | ND | ND | ND | ND | 0.27 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 28000 | ND | ND |
| SPCE07 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 53 | 91 | ND | ND | ND | ND | 14 | ND | ND | ND | ND | ND | ND | 0.43 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 38000 | ND | ND |
| SPCE08 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 73 | 100 | ND | ND | ND | ND | 13 | ND | ND | ND | ND | ND | ND | 0.46 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 48000 | ND | ND |
| SPCE09 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 82 | 95 | ND | ND | ND | ND | 18 | ND | ND | ND | ND | ND | ND | 0.49 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.0085 | ND | ND | ND | ND | ND | 31000 | ND | ND |
| SPCE10 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 53 | 96 | ND | ND | ND | ND | 12 | ND | ND | ND | ND | ND | ND | 1.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.015 | ND | 1.2 | ND | ND | ND | 19000 | ND | ND |
| SPCE11 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 84 | 97 | ND | ND | ND | ND | 14 | ND | ND | ND | ND | ND | ND | 0.38 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.012 | ND | ND | ND | ND | ND | 52000 | ND | ND |
| SPCE12 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 81 | 100 | ND | ND | ND | ND | 5 | ND | ND | ND | ND | ND | ND | 0.33 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.016 | ND | ND | ND | ND | ND | 60000 | ND | ND |
| SPCE13 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 84 | 99 | ND | ND | ND | ND | 5.2 | ND | ND | ND | ND | ND | ND | 0.35 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.015 | ND | ND | ND | ND | ND | 55000 | ND | ND |
| SPCE14 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 55 | 99 | ND | ND | ND | ND | 5.3 | ND | ND | ND | ND | ND | ND | 0.35 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.012 | ND | ND | ND | ND | ND | 38000 | ND | ND |
| SPCE15 | 1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 76 | 100 | ND | ND | ND | ND | 5.3 | ND | ND | ND | ND | ND | ND | 0.41 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.018 | ND | ND | ND | ND | ND | 37000 | ND | ND |
| TP040 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 80 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.021 | ND | ND | ND | ND | ND | | ND | ND |
| TP042 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 72 | 110 | ND | ND | ND | ND | 8.3 | ND | ND | ND | ND | ND | ND | 2.3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 80 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| TP047 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 87 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | 0.58 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 81 | ND | ND | ND | ND | ND | ND | ND | ND | 16000 | ND | ND |
| TP048 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 80 | 96 | ND | ND | ND | ND | 53 | ND | ND | ND | ND | ND | ND | 0.43 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| TP054 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | 110 | ND | ND | ND | ND | 15 | ND | ND | ND | ND | ND | ND | 0.68 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 80 | ND | ND | ND | ND | ND | ND | ND | ND | 28000 | ND | ND |
| TP060 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 83 | 99 | ND | ND | ND | ND | 9.9 | ND | ND | ND | ND | ND | ND | 0.61 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | ND | ND | ND | ND | ND | ND | 46000 | ND | ND |
| TP061 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | 110 | ND | ND | ND | ND | 11 | ND | ND | ND | ND | ND | ND | 0.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 81 | ND | ND | ND | ND | ND | ND | ND | ND | 28000 | ND | ND |
| TP062 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | | 100 | ND | | | | 14 | ND | | | | | | 0.69 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | | ND | ND | | ND | 110 | ND | ND | ND | ND | | | ND | | 41000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 77 | 110 | ND | ND | ND | ND | 8.3 | ND | ND | ND | ND | ND | ND | 0.44 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 83 | ND | ND | ND | ND | ND | ND | ND | ND | 40000 | ND | ND |
| | 1.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 86 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | 0.015 | ND | ND | ND | ND | ND | | ND | ND |
| TP068 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 82 | 99 | ND | ND | ND | ND | 12 | ND | ND | ND | ND | ND | ND | 0.47 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | 0.017 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| | 0.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 78 | 110 | ND | ND | ND | ND | 8 | ND | ND | ND | ND | ND | ND | 0.39 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 81 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| TP069 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 81 | 110 | ND | ND | ND | ND | 9.9 | ND | ND | ND | ND | ND | ND | 0.47 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 82 | ND | ND | ND | ND | ND | ND | ND | ND | 36000 | ND | ND |
| TP070 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 68 | 110 | ND | ND | ND | ND | 9.9 | ND | ND | ND | ND | ND | ND | 0.36 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 80 | ND | ND | ND | ND | ND | ND | ND | ND | 29000 | ND | ND |
| TP078 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 67 | 100 | ND | ND | ND | ND | 8.8 | ND | ND | ND | ND | ND | ND | 0.33 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | 0.016 | ND | ND | ND | ND | ND | 40000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 85 | 100 | ND | ND | ND | ND | 15 | ND | ND | ND | ND | ND | ND | 0.41 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | 0.016 | ND | ND | ND | ND | ND | 37000 | ND | ND |
| TP079 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 82 | 96 | ND | ND | ND | ND | 8.5 | ND | ND | ND | ND | ND | ND | 0.57 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | 0.014 | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP080 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 47 | 110 | ND | ND | ND | ND | 68 | ND | ND | ND | ND | ND | ND | 0.59 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 84 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 69 | 110 | ND | ND | ND | ND | 7 | ND | ND | ND | ND | ND | ND | 0.41 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 83 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 1.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 80 | 110 | ND | ND | ND | ND | 6.9 | ND | ND | ND | ND | ND | ND | 0.78 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 84 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP087 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 58 | 97 | ND | ND | ND | ND | 14 | ND | ND | ND | ND | ND | ND | 0.58 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.0088 | ND | ND | ND | ND | ND | 37000 | ND | ND |
| TP088 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 83 | 110 | ND | ND | ND | ND | 34 | ND | ND | ND | ND | ND | ND | 0.53 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 84 | ND | ND | ND | ND | 1.5 | ND | ND | ND | 49000 | ND | ND |
| TP089 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 73 | 100 | ND | ND | ND | ND | 12 | ND | ND | 1.8 | 2 | 1.6 | ND | 0.67 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.5 | ND | ND | ND | ND | 100 | ND | ND | 0.016 | ND | 3 | ND | ND | 1.7 | 34000 | ND | ND |
| TP090 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 87 | 110 | ND | ND | ND | ND | 8.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 79 | ND | ND | ND | ND | ND | ND | ND | ND | 47000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 80 | 110 | ND | ND | ND | ND | 9.2 | ND | ND | ND | ND | ND | ND | 0.47 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 81 | ND | ND | ND | ND | ND | ND | ND | ND | 47000 | ND | ND |
| | 1.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 57 | 100 | ND | ND | ND | ND | 11 | ND | ND | ND | ND | ND | ND | 0.72 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.014 | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP098 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 82 | 100 | ND | ND | ND | ND | 38 | ND | ND | ND | ND | ND | ND | 0.44 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.0078 | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP100 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 73 | 110 | ND | ND | ND | ND | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 83 | ND | ND | ND | ND | ND | ND | ND | ND | 42000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 75 | 100 | ND | ND | ND | ND | 10 | ND | ND | ND | ND | ND | ND | 0.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.017 | ND | ND | ND | ND | ND | 40000 | ND | ND |
| TP101 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | 100 | ND | ND | ND | ND | 7.9 | ND | ND | ND | ND | ND | ND | 0.3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 91 | ND | ND | ND | ND | ND | ND | ND | ND | 39000 | ND | ND |
| TP107 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 77 | 110 | ND | ND | ND | ND | 45 | ND | ND | ND | ND | ND | ND | 0.77 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 80 | ND | ND | ND | ND | ND | ND | ND | ND | 38000 | ND | ND |
| TP108 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 79 | 100 | ND | ND | ND | ND | 14 | ND | ND | ND | ND | ND | ND | 0.67 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | ND | ND | ND | ND | ND | 32000 | ND | ND |
| TP109 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 79 | 89 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 91 | ND | ND | ND | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP110 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 80 | 100 | ND | ND | ND | ND | 8.6 | ND | ND | ND | ND | ND | ND | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 83 | 100 | ND | ND | ND | ND | 7.4 | ND | ND | ND | ND | ND | ND | 0.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.014 | ND | ND | ND | ND | ND | 38000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 81 | 99 | ND | ND | ND | ND | 7.4 | ND | ND | ND | ND | ND | ND | 0.43 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.0094 | ND | ND | ND | ND | ND | 36000 | ND | ND |
| TP111 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 75 | 110 | ND | ND | ND | ND | 22 | ND | ND | ND | ND | ND | ND | 0.47 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |

TABLE B: Area 1 Phase 2 Validation Analytical Data

| fk_location | Depth | A_1_1_1_2_TETRACHLOROETHANE | A_1_1_1_TRICHLOROETHANE | A_1_1_2_2_TETRACHLOROETHANE | A_1_1_2_TRICHLOROETHANE | A_1_1_DICHLOROETHANE | A_1_1_DICHLOROETHENE | A_1_1_DICHLOROPROPENE | A_1_2_3_TRICHLOROBENZENE | A_1_2_3_TRICHLOROPROPANE | A_1_2_4_TRICHLOROBENZENE | A_1_2_4_TRIMETHYLBENZENE | A_1_2_DIBROMO_3_CHLOROPROPAN | A_1_2_DIBROMOETHANE | A_1_2_DICHLOROBENZENE | A_1_2_DICHLOROETHANE | A_1_2_DICHLOROPROPANE | A_1_3_5_TRIMETHYLBENZENE | A_1_3_DICHLOROBENZENE | A_1_3_DICHLOROPROPANE | A_1_4_DICHLOROBENZENE | A_2_2_DICHLOROPROPANE | A_2_CHLOROTOLUENE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP119 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP120 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP121 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP122 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP130 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP131 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP132 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP133 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP134 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP141 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP142 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP143 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP144 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP151 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP152 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP153 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP154 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP155 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP162 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP163 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP164 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP165 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP173 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP174 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP175 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP176 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP182 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP183 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP185 | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP186 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP187 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP188 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP189 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP196 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

| fk_location | Depth | A_2_FLUOROBIPHENYL | A_4_BROMOFLUOROBENZENE | A_4_CHLOROTOLUENE | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | ARSENIC | BENZENE | BENZO_A_ANTHRACENE | BENZO_A_PYRENE | BENZO_B_FLUORANTHENE | BENZO_G_H_I_PERYLENE | BENZO_K_FLUORANTHENE | BORON |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.7 | 80 | 110 | ND | ND | ND | ND | 11 | ND | ND | ND | ND | ND | ND | 0.78 |
| | 1.4 | 84 | 110 | ND | ND | ND | ND | 9.6 | ND | ND | ND | ND | ND | ND | 0.4 |
| TP119 | 0.1 | 82 | 95 | ND | ND | ND | ND | 16 | ND | ND | ND | ND | ND | ND | 1.1 |
| TP120 | 0.1 | 84 | 100 | ND | ND | ND | ND | 16 | ND | ND | ND | ND | ND | ND | 0.72 |
| TP121 | 0.1 | 86 | 96 | ND | ND | ND | ND | 16 | ND | ND | ND | ND | ND | ND | 0.37 |
| TP122 | 0.1 | 84 | 110 | ND | ND | ND | ND | 18 | ND | ND | ND | ND | ND | ND | 0.52 |
| TP130 | 0.1 | 87 | 99 | ND | ND | ND | ND | 35 | ND | ND | ND | ND | ND | ND | 0.82 |
| TP131 | 0.1 | 78 | 96 | ND | ND | ND | ND | 12 | ND | ND | ND | ND | ND | ND | 0.54 |
| TP132 | 0.1 | 75 | 100 | ND | ND | ND | ND | 5.7 | ND | ND | ND | ND | ND | ND | 0.41 |
| | 0.7 | 90 | 100 | ND | ND | ND | ND | 22 | ND | ND | ND | ND | ND | ND | 0.35 |
| TP133 | 0.1 | 71 | 100 | ND | ND | ND | ND | 19 | ND | ND | ND | ND | ND | ND | 0.48 |
| | 0.7 | 80 | 100 | ND | ND | ND | ND | 8.7 | ND | ND | ND | ND | ND | ND | 1.6 |
| | 1.5 | 77 | 100 | ND | ND | ND | ND | 9.4 | ND | ND | ND | ND | ND | ND | 0.54 |
| TP134 | 0.1 | 70 | 99 | ND | ND | ND | ND | 12 | ND | ND | ND | ND | ND | ND | 0.82 |
| | 0.7 | 67 | 95 | ND | ND | ND | 1.4 | 21 | ND | 5.5 | 4.7 | 4.8 | 2 | 2.5 | 1.2 |
| | 1.4 | 51 | 99 | ND | ND | ND | ND | 10 | ND | ND | ND | ND | ND | ND | 0.45 |
| TP141 | 0.1 | 78 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP142 | 0.1 | 83 | 94 | ND | ND | ND | ND | 11 | ND | ND | ND | ND | ND | ND | 0.49 |
| TP143 | 0.1 | 57 | 100 | ND | ND | ND | ND | 9.4 | ND | ND | ND | ND | ND | ND | 0.53 |
| | 0.7 | 64 | 100 | ND | ND | ND | ND | 11 | ND | ND | ND | ND | ND | ND | 0.62 |
| | 1.4 | 80 | 100 | ND | ND | ND | ND | 9.1 | ND | ND | ND | ND | ND | ND | 0.34 |
| TP144 | 0.1 | 59 | 100 | ND | ND | ND | ND | 43 | ND | ND | ND | ND | ND | ND | 0.5 |
| | 0.7 | 56 | 99 | ND | ND | ND | ND | 9.8 | ND | ND | ND | ND | ND | ND | 0.58 |
| | 1.4 | 110 | 100 | ND | ND | ND | ND | 11 | ND | ND | ND | ND | ND | ND | 0.37 |
| | 2.1 | 63 | 99 | ND | ND | ND | ND | 8.8 | ND | ND | ND | ND | ND | ND | 0.47 |
| TP151 | 0.1 | 77 | 100 | ND | ND | ND | ND | 13 | ND | ND | ND | ND | ND | ND | 1.3 |
| TP152 | 0.1 | 68 | 98 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 74 | 100 | ND | ND | ND | ND | | ND | 2.3 | 2.5 | 3.8 | 2.3 | 1.4 | |
| TP153 | 0.1 | 64 | 100 | ND | ND | ND | ND | 15 | ND | ND | ND | ND | ND | ND | 0.33 |
| | 0.7 | 75 | 100 | ND | ND | ND | ND | 16 | ND | ND | ND | ND | ND | ND | 0.39 |
| | 1.4 | 82 | 100 | ND | ND | ND | ND | 9.7 | ND | ND | ND | ND | ND | ND | 0.36 |
| TP154 | 0.1 | 80 | 98 | ND | ND | ND | ND | 24 | ND | ND | ND | ND | ND | ND | 0.72 |
| TP155 | 0.1 | 83 | 100 | ND | ND | ND | ND | 8.5 | ND | ND | ND | ND | ND | ND | 0.25 |
| | 0.7 | 58 | 100 | ND | ND | ND | ND | 8.7 | ND | ND | ND | ND | ND | ND | ND |
| TP162 | 0.1 | 72 | 110 | ND | ND | ND | ND | 10 | ND | ND | ND | ND | ND | ND | 0.47 |
| TP163 | 0.1 | 69 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 77 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 68 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP164 | 0.1 | 79 | 100 | ND | ND | ND | ND | 17 | ND | ND | ND | ND | ND | ND | 0.92 |
| | 0.7 | 85 | 100 | ND | ND | ND | ND | 12 | ND | ND | ND | ND | ND | ND | 0.54 |
| | 1.4 | 47 | 98 | ND | ND | ND | ND | 9.7 | ND | ND | ND | ND | ND | ND | 0.31 |
| TP165 | 0.1 | 72 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 84 | 98 | ND | ND | ND | ND | 10 | ND | ND | ND | ND | ND | ND | 0.31 |
| TP173 | 0.1 | 77 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 72 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 70 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP174 | 0.1 | 56 | 100 | ND | ND | ND | ND | 6.3 | ND | ND | ND | ND | ND | ND | 0.37 |
| TP175 | 0.1 | 64 | 100 | ND | ND | ND | ND | 15 | ND | ND | ND | ND | ND | ND | 0.33 |
| | 0.7 | 69 | 100 | ND | ND | ND | ND | 8.8 | ND | ND | ND | ND | ND | ND | 0.27 |
| TP176 | 0.1 | 72 | 96 | ND | ND | ND | ND | 16 | ND | ND | ND | ND | ND | ND | 0.48 |
| | 0.7 | 84 | 95 | ND | ND | ND | ND | 12 | ND | ND | ND | ND | ND | ND | 0.26 |
| TP182 | 0.1 | 70 | 94 | ND | ND | ND | ND | 6.8 | ND | ND | ND | ND | ND | ND | 0.38 |
| | 0.7 | 60 | 94 | ND | ND | ND | ND | 6.7 | ND | ND | ND | ND | ND | ND | 0.84 |
| TP183 | 0.1 | 75 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 71 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 64 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP185 | 0.7 | 79 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 85 | 99 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 84 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP186 | 0.1 | 71 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 77 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP187 | 0.1 | 66 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 60 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP188 | 0.1 | 72 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 78 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP189 | 0.1 | 58 | 100 | ND | ND | ND | ND | 56 | ND | ND | ND | ND | ND | ND | 0.68 |
| TP196 | 0.1 | 73 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 68 | 99 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 71 | 98 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 27 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |

| fk_location | Depth | BROMOBENZENE | BROMOCHLOROMETHANE | BROMODICHLOROMETHANE | BROMOFORM | BROMOMETHANE | CARBON_TETRACHLORIDE | CHLOROBENZENE | CHLOROETHANE | CHLOROFORM | CHLOROMETHANE | CHRYSENE | CIS_1_2_DICHLOROETHENE | CIS_1_3_DICHLOROPROPENE | DIBENZ_A_H_ANTHRACENE | DIBROMOCHLOROMETHANE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP119 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP120 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP121 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP122 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP130 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP131 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP132 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP133 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP134 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.8 | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP141 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP142 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP143 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP144 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP151 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP152 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.7 | ND | ND | ND | ND |
| TP153 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP154 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP155 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP162 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP163 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP164 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP165 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP173 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP174 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP175 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP176 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP182 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP183 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP185 | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP186 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP187 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP188 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP189 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP196 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

| fk_location | Depth | DIBROMOFLUOROMETHANE | DIBROMOMETHANE | DICHLORODIFLUOROMETHANE | DICHLOROMETHANE | ETHYLBENZENE | FLUORANTHENE | FLUORENE | HEXACHLOROBUTADIENE | INDENO_1_2_3_CD_PYRENE | IRON | ISOPROPYLBENZENE | M_P_XYLENE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.7 | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 1.4 | 92 | ND | ND | ND | ND | ND | ND | ND | ND | 40000 | ND | ND |
| TP119 | 0.1 | 110 | ND | ND | 0.02 | ND | ND | ND | ND | ND | 36000 | ND | ND |
| TP120 | 0.1 | 100 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP121 | 0.1 | 100 | ND | ND | 0.013 | ND | ND | ND | ND | ND | 38000 | ND | ND |
| TP122 | 0.1 | 93 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| TP130 | 0.1 | 99 | ND | ND | 0.01 | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP131 | 0.1 | 100 | ND | ND | 0.016 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP132 | 0.1 | 98 | ND | ND | 0.0077 | ND | ND | ND | ND | ND | 35000 | ND | ND |
| | 0.7 | 98 | ND | ND | 0.014 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP133 | 0.1 | 100 | ND | ND | 0.0083 | ND | ND | ND | ND | ND | 48000 | ND | ND |
| | 0.7 | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 36000 | ND | ND |
| | 1.5 | 100 | ND | ND | 0.0075 | ND | ND | ND | ND | ND | 45000 | ND | ND |
| TP134 | 0.1 | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 38000 | ND | ND |
| | 0.7 | 110 | ND | ND | ND | ND | 12 | ND | ND | 2.2 | 45000 | ND | ND |
| | 1.4 | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 42000 | ND | ND |
| TP141 | 0.1 | 82 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| TP142 | 0.1 | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 39000 | ND | ND |
| TP143 | 0.1 | 90 | ND | ND | 0.0098 | ND | ND | ND | ND | ND | 60000 | ND | ND |
| | 0.7 | 91 | ND | ND | ND | ND | ND | ND | ND | ND | 33000 | ND | ND |
| | 1.4 | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP144 | 0.1 | 100 | ND | ND | 0.013 | ND | ND | ND | ND | ND | 39000 | ND | ND |
| | 0.7 | 100 | ND | ND | 0.0063 | ND | ND | ND | ND | ND | 37000 | ND | ND |
| | 1.4 | 100 | ND | ND | 0.0085 | ND | ND | ND | ND | ND | 38000 | ND | ND |
| | 2.1 | 100 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 38000 | ND | ND |
| TP151 | 0.1 | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 41000 | ND | ND |
| TP152 | 0.1 | 97 | ND | ND | 0.017 | ND | ND | ND | ND | ND | 28000 | ND | ND |
| | 0.7 | 97 | ND | ND | 0.019 | ND | 3.1 | ND | ND | 2.3 | 45000 | ND | ND |
| TP153 | 0.1 | 94 | ND | ND | 0.0057 | ND | ND | ND | ND | ND | 38000 | ND | ND |
| | 0.7 | 99 | ND | ND | ND | ND | 1.5 | ND | ND | ND | 39000 | ND | ND |
| | 1.4 | 91 | ND | ND | ND | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP154 | 0.1 | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 32000 | ND | ND |
| TP155 | 0.1 | 99 | ND | ND | 0.0073 | ND | ND | ND | ND | ND | 40000 | ND | ND |
| | 0.7 | 100 | ND | ND | 0.012 | ND | ND | ND | ND | ND | 47000 | ND | ND |
| TP162 | 0.1 | 82 | ND | ND | ND | ND | ND | ND | ND | ND | 39000 | ND | ND |
| TP163 | 0.1 | 94 | ND | ND | 0.008 | ND | ND | ND | ND | ND | 37000 | ND | ND |
| | 0.7 | 93 | ND | ND | 0.0069 | ND | ND | ND | ND | ND | 30000 | ND | ND |
| | 1.4 | 94 | ND | ND | 0.007 | ND | ND | ND | ND | ND | 26000 | ND | ND |
| TP164 | 0.1 | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 0.7 | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 36000 | ND | ND |
| | 1.4 | 98 | ND | ND | ND | ND | ND | ND | ND | ND | 47000 | ND | ND |
| TP165 | 0.1 | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 45000 | ND | ND |
| | 0.7 | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 40000 | ND | ND |
| TP173 | 0.1 | 96 | ND | ND | 0.017 | ND | ND | ND | ND | ND | 68000 | ND | ND |
| | 0.7 | 98 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 39000 | ND | ND |
| | 1.4 | 100 | ND | ND | 0.0076 | ND | ND | ND | ND | ND | 34000 | ND | ND |
| TP174 | 0.1 | 97 | ND | ND | 0.013 | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP175 | 0.1 | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| | 0.7 | 98 | ND | ND | ND | ND | ND | ND | ND | ND | 47000 | ND | ND |
| TP176 | 0.1 | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| | 0.7 | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| TP182 | 0.1 | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 0.7 | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 29000 | ND | ND |
| TP183 | 0.1 | 93 | ND | ND | 0.021 | ND | ND | ND | ND | ND | 59000 | ND | ND |
| | 0.7 | 95 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 39000 | ND | ND |
| | 1.4 | 93 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 31000 | ND | ND |
| TP185 | 0.7 | 93 | ND | ND | ND | ND | ND | ND | ND | ND | 43000 | ND | ND |
| | 1.4 | 98 | ND | ND | ND | ND | ND | ND | ND | ND | 46000 | ND | ND |
| | 2.1 | 97 | ND | ND | 0.0067 | ND | ND | ND | ND | ND | 41000 | ND | ND |
| TP186 | 0.1 | 97 | ND | ND | 0.0087 | ND | ND | ND | ND | ND | 37000 | ND | ND |
| | 0.7 | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 36000 | ND | ND |
| TP187 | 0.1 | 94 | ND | ND | 0.013 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| | 0.7 | 95 | ND | ND | 0.0091 | ND | ND | ND | ND | ND | 49000 | ND | ND |
| TP188 | 0.1 | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 70000 | ND | ND |
| | 0.7 | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 40000 | ND | ND |
| TP189 | 0.1 | 100 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP196 | 0.1 | 94 | ND | ND | 0.0063 | ND | ND | ND | ND | ND | 46000 | ND | ND |
| | 0.7 | 93 | ND | ND | 0.014 | ND | ND | ND | ND | ND | 46000 | ND | ND |
| | 1.4 | 93 | ND | ND | 0.0055 | ND | ND | ND | ND | ND | 30000 | ND | ND |
| | 2.1 | 89 | ND | ND | 0.019 | ND | ND | ND | ND | ND | 29000 | ND | ND |

TABLE B: Area 1 Phase 2 Validation Analytical Data

| fk_location | Depth | A_1_1_1_2_TETRACHLOROETHANE | A_1_1_1_TRICHLOROETHANE | A_1_1_2_2_TETRACHLOROETHANE | A_1_1_2_TRICHLOROETHANE | A_1_1_DICHLOROETHANE | A_1_1_DICHLOROETHENE | A_1_1_DICHLOROPROPENE | A_1_2_3_TRICHLOROBENZENE | A_1_2_3_TRICHLOROPROPANE | A_1_2_4_TRICHLOROBENZENE | A_1_2_4_TRIMETHYLBENZENE | A_1_2_DIBROMO_3_CHLOROPROPAN | A_1_2_DIBROMOETHANE | A_1_2_DICHLOROBENZENE | A_1_2_DICHLOROETHANE | A_1_2_DICHLOROPROPANE | A_1_3_5_TRIMETHYLBENZENE | A_1_3_DICHLOROBENZENE | A_1_3_DICHLOROPROPANE | A_1_4_DICHLOROBENZENE | A_2_2_DICHLOROPROPANE | A_2_CHLOROTOLUENE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TP197 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP198 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP199 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP200 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP201 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP206 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP207 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP208 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP209 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP210 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP211 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP212 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP213 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP214 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP215 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP216 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP218 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP219 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP220 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP221 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP222 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP225 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP226 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP227 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |

| fk_location | Depth | A_2_FLUOROBIPHENYL | A_4_BROMOFLUOROBENZENE | A_4_CHLOROTOLUENE | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | ARSENIC | BENZENE | BENZO_A_ANTHRACENE | BENZO_A_PYRENE | BENZO_B_FLUORANTHENE | BENZO_G_H_I_PERYLENE | BENZO_K_FLUORANTHENE | BORON |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TP197 | 0.1 | 80 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 70 | 98 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP198 | 0.1 | 76 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 77 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 73 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP199 | 0.1 | 78 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 54 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 69 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP200 | 0.1 | 55 | 100 | ND | ND | ND | ND | 9.7 | ND | ND | ND | ND | ND | ND | 0.42 |
| | 0.7 | 75 | 100 | ND | ND | ND | ND | 7.5 | ND | ND | ND | ND | ND | ND | 0.3 |
| | 1.4 | 79 | 100 | ND | ND | ND | ND | 8.2 | ND | ND | ND | ND | ND | ND | 0.48 |
| TP201 | 0.1 | 78 | 100 | ND | ND | ND | ND | 7.4 | ND | ND | ND | ND | ND | ND | 0.29 |
| | 0.7 | 79 | 100 | ND | ND | ND | ND | 4.6 | ND | ND | ND | ND | ND | ND | ND |
| TP206 | 0.1 | 58 | 90 | ND | ND | ND | ND | 14 | ND | ND | ND | ND | ND | ND | 0.49 |
| | 0.7 | 50 | 94 | ND | ND | ND | ND | 7.8 | ND | ND | ND | ND | ND | ND | 1.4 |
| | 1.4 | 60 | 92 | ND | ND | ND | ND | 5.9 | ND | ND | ND | ND | ND | ND | 0.88 |
| TP207 | 0.1 | 67 | 100 | ND | ND | ND | ND | 4.6 | ND | ND | ND | ND | ND | ND | 2.5 |
| | 0.7 | 88 | 100 | ND | ND | ND | ND | 5.3 | ND | ND | ND | ND | ND | ND | 1.5 |
| TP208 | 0.1 | 74 | 100 | ND | ND | ND | ND | | ND | 1.6 | 1.3 | 1.6 | ND | ND | |
| | 0.7 | 72 | 99 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 77 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 78 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP209 | 0.1 | 62 | 99 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 74 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 73 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 63 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 2.8 | 76 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP210 | 0.1 | 85 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 83 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP211 | 0.1 | 62 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.4 | 83 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 69 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 60 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 2.8 | 70 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP212 | 0.1 | 67 | 90 | ND | ND | ND | ND | 23 | ND | ND | ND | ND | ND | ND | 0.67 |
| | 0.7 | 68 | 100 | ND | ND | ND | ND | 18 | ND | ND | ND | ND | ND | ND | 0.6 |
| TP213 | 0.1 | 37 | 100 | ND | ND | ND | ND | 59 | ND | ND | ND | ND | ND | ND | 0.72 |
| | 0.7 | 55 | 100 | ND | ND | ND | ND | 8.2 | ND | ND | ND | ND | ND | ND | 0.3 |
| | 1.4 | 62 | 100 | ND | ND | ND | ND | 13 | ND | ND | ND | ND | ND | ND | 0.33 |
| | 2.1 | 51 | 110 | ND | ND | ND | ND | 17 | ND | ND | ND | ND | ND | ND | 0.45 |
| TP214 | 0.1 | 82 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 79 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 80 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP215 | 0.1 | 70 | 89 | ND | ND | ND | ND | 10 | ND | ND | ND | ND | ND | ND | 0.48 |
| | 0.7 | 79 | 94 | ND | ND | ND | ND | 5.9 | ND | ND | ND | ND | ND | ND | 0.47 |
| TP216 | 0.1 | 64 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP218 | 0.1 | 47 | 92 | ND | ND | ND | ND | 20 | ND | 2.1 | 1.3 | 1.6 | ND | ND | 0.5 |
| | 0.7 | 79 | 93 | ND | ND | ND | ND | 6.5 | ND | ND | ND | ND | ND | ND | 0.53 |
| | 1.4 | 72 | 95 | ND | ND | ND | ND | 6.6 | ND | ND | ND | ND | ND | ND | 0.37 |
| TP219 | 0.1 | 61 | 93 | ND | ND | ND | ND | 16 | ND | ND | ND | ND | ND | ND | 1.5 |
| | 0.7 | 79 | 100 | ND | ND | ND | ND | 12 | ND | ND | ND | ND | ND | ND | 0.52 |
| TP220 | 0.1 | 73 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 70 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 46 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 78 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP221 | 0.1 | 85 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 81 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 76 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 80 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP222 | 0.1 | 76 | 99 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 69 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP225 | 0.1 | 80 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 63 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 45 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP226 | 0.1 | 73 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 75 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 1.4 | 76 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 2.1 | 71 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| TP227 | 0.1 | 55 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |
| | 0.7 | 67 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | |

| fk_location | Depth | BROMOBENZENE | BROMOCHLOROMETHANE | BROMODICHLOROMETHANE | BROMOFORM | BROMOMETHANE | CARBON_TETRACHLORIDE | CHLOROBENZENE | CHLOROETHANE | CHLOROFORM | CHLOROMETHANE | CHRYSENE | CIS_1_2_DICHLOROETHENE | CIS_1_3_DICHLOROPROPENE | DIBENZ_A_H_ANTHRACENE | DIBROMOCHLOROMETHANE | DIBROMOFLUOROMETHANE | DIBROMOMETHANE | DICHLORODIFLUOROMETHANE | DICHLOROMETHANE | ETHYLBENZENE | FLUORANTHENE | FLUORENE | HEXACHLOROBUTADIENE | INDENO_1_2_3_CD_PYRENE | IRON | ISOPROPYLBENZENE | M_P_XYLENE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TP197 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | 0.0075 | ND | ND | ND | ND | ND | 40000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 32000 | ND | ND |
| TP198 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 59000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP199 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP200 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | 0.0076 | ND | ND | ND | ND | ND | 36000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | 0.008 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP201 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 92 | ND | ND | 0.0081 | ND | ND | ND | ND | ND | 30000 | ND | ND |
| TP206 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 32000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 29000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP207 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | ND | ND | ND | ND | ND | ND | 38000 | ND | ND |
| TP208 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.4 | ND | ND | ND | ND | 97 | ND | ND | 0.0065 | ND | 1.9 | ND | ND | ND | 36000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | 0.016 | ND | ND | ND | ND | ND | 32000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | ND | ND | ND | ND | ND | ND | 36000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 34000 | ND | ND |
| TP209 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | ND | ND | ND | ND | ND | ND | 44000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 98 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | 0.0095 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | 0.0079 | ND | ND | ND | ND | ND | 49000 | ND | ND |
| | 2.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| TP210 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | 0.0081 | ND | ND | ND | ND | ND | 29000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 34000 | ND | ND |
| TP211 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 42000 | ND | ND |
| | 0.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 33000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | 1.4 | ND | ND | ND | 33000 | ND | ND |
| | 2.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 32000 | ND | ND |
| TP212 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 30000 | ND | ND |
| TP213 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 93 | ND | ND | 0.013 | ND | ND | ND | ND | ND | 41000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 93 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP214 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 39000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 41000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | 0.0081 | ND | ND | ND | ND | ND | 38000 | ND | ND |
| TP215 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 120 | ND | ND | ND | ND | ND | ND | ND | ND | 69000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 61000 | ND | ND |
| TP216 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | ND | ND | ND | ND | ND | 47000 | ND | ND |
| TP218 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.6 | ND | ND | ND | ND | 110 | ND | ND | ND | ND | 3.2 | ND | ND | ND | 39000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 44000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 52000 | ND | ND |
| TP219 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | 0.0056 | ND | ND | ND | ND | ND | 82000 | ND | ND |
| TP220 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | ND | ND | ND | ND | ND | ND | 41000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | 0.007 | ND | ND | ND | ND | ND | 43000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 92 | ND | ND | 0.014 | ND | ND | ND | ND | ND | 36000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | 0.016 | ND | ND | ND | ND | ND | 36000 | ND | ND |
| TP221 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | 0.013 | ND | ND | ND | ND | ND | 36000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | 0.017 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | ND | ND | ND | ND | ND | ND | 42000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | ND | ND | ND | ND | ND | 38000 | ND | ND |
| TP222 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 43000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 36000 | ND | ND |
| TP225 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | ND | ND | ND | ND | ND | 38000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 33000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 31000 | ND | ND |
| TP226 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | 0.0093 | ND | ND | ND | ND | ND | 52000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 40000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 28000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | 0.0091 | ND | ND | ND | ND | ND | 36000 | ND | ND |
| TP227 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | 0.006 | ND | ND | ND | ND | ND | 43000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 50000 | ND | ND |

TABLE B: Area 1 Phase 2 Validation Analytical Data

| fk_location | Depth | A_1_1_1_2_TETRACHLOROETHANE | A_1_1_1_TRICHLOROETHANE | A_1_1_2_2_TETRACHLOROETHANE | A_1_1_2_TRICHLOROETHANE | A_1_1_DICHLOROETHANE | A_1_1_DICHLOROETHENE | A_1_1_DICHLOROPROPENE | A_1_2_3_TRICHLOROBENZENE | A_1_2_3_TRICHLOROPROPANE | A_1_2_4_TRICHLOROBENZENE | A_1_2_4_TRIMETHYLBENZENE | A_1_2_DIBROMO_3_CHLOROPROPAN | A_1_2_DIBROMOETHANE | A_1_2_DICHLOROBENZENE | A_1_2_DICHLOROETHANE | A_1_2_DICHLOROPROPANE | A_1_3_5_TRIMETHYLBENZENE | A_1_3_DICHLOROBENZENE | A_1_3_DICHLOROPROPANE | A_1_4_DICHLOROBENZENE | A_2_2_DICHLOROPROPANE | A_2_CHLOROTOLUENE | A_2_FLUOROBIPHENYL | A_4_BROMOFLUOROBENZENE | A_4_CHLOROTOLUENE | ACENAPHTHENE | ACENAPHTHYLENE | ANTHRACENE | ARSENIC | BENZENE | BENZO_A_ANTHRACENE | BENZO_A_PYRENE | BENZO_B_FLUORANTHENE | BENZO_G_H_I_PERYLENE | BENZO_K_FLUORANTHENE | BORON | BROMOBENZENE | BROMOCHLOROMETHANE | BROMODICHLOROMETHANE | BROMOFORM | BROMOMETHANE | CARBON_TETRACHLORIDE | CHLOROBENZENE | CHLOROETHANE | CHLOROFORM | CHLOROMETHANE | CHRYSENE | CIS_1_2_DICHLOROETHENE | CIS_1_3_DICHLOROPROPENE | DIBENZ_A_H_ANTHRACENE | DIBROMOCHLOROMETHANE | DIBROMOFLUOROMETHANE | DIBROMOMETHANE | DICHLORODIFLUOROMETHANE | DICHLOROMETHANE | ETHYLBENZENE | FLUORANTHENE | FLUORENE | HEXACHLOROBUTADIENE | INDENO_1_2_3_CD_PYRENE | IRON | ISOPROPYLBENZENE | M_P_XYLENE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 71 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 93 | ND | ND | ND | ND | ND | ND | ND | ND | 44000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 61 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | 0.0066 | ND | ND | ND | ND | ND | 37000 | ND | ND |
| TP229 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 62 | 92 | ND | ND | ND | ND | 8.8 | ND | ND | ND | ND | ND | ND | 0.72 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 37000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 73 | 92 | ND | ND | ND | ND | 5.9 | ND | ND | ND | ND | ND | ND | 0.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 120 | ND | ND | ND | ND | ND | ND | ND | ND | 36000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 45 | 100 | ND | ND | ND | ND | 5.3 | ND | ND | ND | ND | ND | ND | 0.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 41000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 81 | 100 | ND | ND | ND | ND | 3.2 | ND | ND | ND | ND | ND | ND | 0.45 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 24000 | ND | ND |
| | 2.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 75 | 100 | ND | ND | ND | ND | 4.7 | ND | ND | ND | ND | ND | ND | 0.25 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 42000 | ND | ND |
| TP230 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 58 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP231 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 73 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | 0.0063 | ND | ND | ND | ND | ND | 37000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 51 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 27000 | ND | ND |
| TP232 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 62 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 55 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 93 | ND | ND | 0.015 | ND | ND | ND | ND | ND | 40000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 71 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | 0.0098 | ND | ND | ND | ND | ND | 45000 | ND | ND |
| TP233 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 53 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | 0.0085 | ND | ND | ND | ND | ND | 44000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 65 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | 0.011 | ND | ND | ND | ND | ND | 48000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 58 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 93 | ND | ND | 0.0092 | ND | ND | ND | ND | ND | 56000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 80 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | 0.0088 | ND | ND | ND | ND | ND | 48000 | ND | ND |
| TP234 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 67 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 42000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 68 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 43000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 45 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | ND | ND | ND | ND | ND | 44000 | ND | ND |
| TP235 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 42 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 29000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 84 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 72 | 99 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 33000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 53 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 41000 | ND | ND |
| TP236 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 81 | 100 | ND | ND | ND | ND | 7.3 | ND | ND | ND | ND | ND | ND | 0.37 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 41000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 62 | 97 | ND | ND | ND | ND | 3.2 | ND | ND | ND | ND | ND | ND | 0.45 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 26000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 85 | 92 | ND | ND | ND | ND | 4.2 | ND | ND | ND | ND | ND | ND | 0.45 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | ND | ND | ND | ND | ND | ND | 24000 | ND | ND |
| TP237 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 42 | 93 | ND | ND | ND | ND | 9.3 | ND | ND | ND | ND | ND | ND | 0.29 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 27000 | ND | ND |
| TP238 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 66 | 95 | ND | ND | ND | ND | 9.8 | ND | ND | ND | ND | ND | ND | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 42000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 55 | 96 | ND | ND | ND | ND | 7.8 | ND | ND | ND | ND | ND | ND | 0.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 40000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 60 | 92 | ND | ND | ND | ND | 6.8 | ND | ND | ND | ND | ND | ND | 0.41 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 52000 | ND | ND |
| TP239 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 71 | 92 | ND | ND | ND | ND | 10 | ND | ND | ND | ND | ND | ND | 0.39 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP240 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 42 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | 0.0062 | ND | ND | ND | ND | ND | 44000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 64 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | 0.0071 | ND | ND | ND | ND | ND | 42000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 78 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 41000 | ND | ND |
| TP241 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 82 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 91 | ND | ND | ND | ND | ND | ND | ND | ND | 46000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 76 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | 0.012 | ND | ND | ND | ND | ND | 39000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 41 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | 0.0072 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP242 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 78 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 55 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 32 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 91 | ND | ND | ND | ND | ND | ND | ND | ND | 32000 | ND | ND |
| TP244 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18 | 100 | ND | ND | ND | ND | 12 | ND | ND | ND | ND | ND | ND | 0.46 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 38000 | ND | ND |
| TP245 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 74 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 99 | ND | ND | ND | ND | ND | ND | ND | ND | 39000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 73 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 93 | ND | ND | 0.0072 | ND | ND | ND | ND | ND | 38000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 85 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 43 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | 0.02 | ND | ND | ND | ND | ND | 33000 | ND | ND |
| TP246 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 60 | 100 | ND | ND | ND | ND | 45 | ND | ND | ND | ND | ND | ND | 0.36 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.006 | ND | ND | ND | ND | ND | 38000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 70 | 99 | ND | ND | ND | ND | 23 | ND | ND | ND | ND | ND | ND | 0.47 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 42000 | ND | ND |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 57 | 99 | ND | ND | ND | ND | 8.7 | ND | ND | ND | ND | ND | ND | 0.27 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 0.0085 | ND | ND | ND | ND | ND | 44000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 64 | 98 | ND | ND | ND | ND | 5.1 | ND | ND | ND | ND | ND | ND | 0.65 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.012 | ND | ND | ND | ND | ND | 30000 | ND | ND |
| TP247 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 82 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | ND | ND | ND | ND | ND | ND | 31000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 42 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP248 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 76 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | ND | ND | ND | ND | ND | ND | 35000 | ND | ND |
| TP249 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 79 | 100 | ND | ND | ND | ND | 5.7 | ND | ND | ND | ND | ND | ND | 0.55 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| TP250 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 50 | 100 | ND | ND | ND | ND | 10 | ND | ND | 1.2 | 1.7 | ND | ND | 0.47 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | 1.6 | ND | ND | ND | 32000 | ND | ND |
| TP251 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 41 | 99 | ND | ND | ND | ND | 5.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | 0.0083 | ND | ND | ND | ND | ND | 47000 | ND | ND |
| TP36 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 89 | 100 | ND | ND | ND | ND | 11 | ND | ND | ND | ND | ND | ND | 0.33 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 91 | ND | ND | 0.012 | ND | ND | ND | ND | ND | 37000 | ND | ND |
| TP53 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 78 | 100 | ND | ND | ND | ND | | ND | 2.4 | 2.7 | 4 | 2.3 | 1.4 | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3 | ND | ND | ND | ND | 94 | ND | ND | 0.021 | ND | 3.5 | ND | ND | 2.4 | 21000 | ND | ND |
| TP99 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 71 | 100 | ND | ND | ND | ND | 33 | ND | ND | ND | ND | ND | ND | 0.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 34000 | ND | ND |
| TP184 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 71 | 100 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 94 | ND | ND | ND | ND | ND | ND | ND | ND | 53000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 77 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | 0.008 | ND | ND | ND | ND | ND | 44000 | ND | |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 76 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 93 | ND | ND | 0.012 | ND | ND | ND | ND | ND | 52000 | ND | ND |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 78 | 110 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 95 | ND | ND | 0.0083 | ND | ND | ND | ND | ND | 39000 | ND | ND |
| | 0.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | ND |
| TP171 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 60 | 95 | ND | ND | ND | ND | | ND | 2.1 | 1.5 | 2 | ND | ND | 1.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.9 | ND | ND | ND | ND | 100 | ND | ND | ND | ND | 3 | ND | ND | ND | 27000 | ND | ND |
| TP172 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 56 | 96 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | 0.52 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 42000 | ND | ND |
| TP228 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 73 | 97 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | 0.49 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | ND | ND | ND | ND | 30000 | ND | ND |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 74 | 97 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | 0.31 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 28000 | ND | ND |
| TP243 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 | 95 | ND | ND | ND | ND | | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | ND | ND | ND | ND | 53000 | ND | ND |

# TABLE B: Area 1 Phase 2 Validation Analytical Data

| fk_location | Depth | MANGANESE | MOISTURE | N_BUTYLBENZENE | N_PROPYLBENZENE | NAPHTHALENE | O_XYLENE | P_ISOPROPYLTOLUENE | PHENANTHRENE | PYRENE | RISK_EPH_C5_C44 | RISK_TPH_C10_C12_ALI | RISK_TPH_C10_C12_AROM | RISK_TPH_C12_C16_ALI | RISK_TPH_C12_C16_AROM | RISK_TPH_C16_C21_ALI | RISK_TPH_C16_C21_AROM | RISK_TPH_C21_C40_ALI | RISK_TPH_C21_C40_AROM | RISK_TPH_C5_C44_ALI | RISK_TPH_C5_C44_ARO |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CE04 | 1 | 840 | 38 | ND | ND | ND | ND | ND | 11 | 13 | 270 | ND | ND | ND | ND | ND | 9.5 | 74 | 190 | 74 | 190 |
| CE05 | 1 | 850 | 17 | ND | ND | ND | ND | ND | ND | ND | 67 | 8.7 | ND | 20 | ND | 5.8 | ND | 33 | ND | 67 | ND |
| CE06B | 1 | 1100 | 7.7 | ND | ND | ND | ND | ND | ND | ND | 1500 | 360 | 15 | 850 | 160 | 31 | 16 | 25 | ND | 1300 | 200 |
| CE06N | 1 | 1100 | 10 | ND | ND | ND | ND | ND | ND | ND | 76 | 9.4 | ND | 64 | ND | 1.4 | ND | ND | ND | 76 | ND |
| CE06S | 1 | 820 | 16 | ND | ND | ND | ND | ND | ND | ND | 170 | 18 | ND | 65 | ND | 29 | ND | 57 | ND | 170 | ND |
| CE07 | 3 | 690 | 13 | ND | ND | ND | ND | ND | ND | ND | 540 | 130 | 7.4 | 300 | 49 | 22 | 20 | 8.5 | 11 | 460 | 87 |
| CE08 | 3 | 1400 | 21 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| CE09 | 3 | 800 | 12 | ND | ND | ND | ND | ND | ND | ND | 31 | 9.5 | ND | 20 | ND | ND | ND | ND | ND | 31 | ND |
| CE10 | 3 | 620 | 18 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| CEO1N | 0.5 | 630 | 2.4 | ND | ND | ND | ND | ND | ND | ND | 170 | 45 | ND | 110 | 16 | 3.6 | ND | ND | ND | 150 | 16 |
| CEO1S | 0.5 | 370 | 17 | ND | ND | ND | ND | ND | ND | ND | 270 | 54 | ND | 170 | 22 | 7.7 | 9.5 | ND | ND | 240 | 31 |
| CEO2N | 1.5 | 1000 | 17 | ND | ND | ND | ND | ND | ND | ND | 390 | 55 | ND | 130 | 49 | 42 | 47 | 24 | 31 | 250 | 130 |
| CEO2S | 1.5 | 660 | 16 | ND | ND | ND | ND | ND | ND | ND | 460 | 79 | 12 | 150 | 57 | 60 | 50 | 19 | 25 | 310 | 140 |
| CEO3 | 1 | 620 | 18 | ND | ND | ND | ND | ND | ND | ND | 30 | 9 | ND | 16 | ND | 5.6 | ND | ND | ND | 30 | ND |
| MS189 | 1.5 | 1200 | 14 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| SPCE01 | 1 | 840 | 14 | ND | ND | ND | ND | ND | ND | ND | 31 | ND | ND | ND | ND | ND | 7.4 | ND | 24 | ND | 31 |
| SPCE01D | 2 | 770 | 15 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| SPCE02 | 1 | 1100 | 16 | ND | ND | ND | ND | ND | ND | ND | 42 | ND | ND | ND | ND | ND | 10 | ND | 31 | ND | 42 |
| SPCE02D | 2 | 900 | 15 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| SPCE03 | 1 | 980 | 16 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| SPCE03D | 2 | 900 | 18 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| SPCE04 | 1 | 540 | 9.4 | ND | ND | ND | ND | ND | ND | ND | 23 | ND | ND | ND | ND | ND | 5.8 | ND | 18 | ND | 23 |
| SPCE05 | 1 | 730 | 7.3 | ND | ND | ND | ND | ND | ND | ND | 19 | ND | ND | ND | ND | ND | ND | 19 | ND | 19 | ND |
| SPCE06 | 1 | 530 | 9.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| SPCE07 | 1 | 770 | 9.8 | ND | ND | ND | ND | ND | ND | ND | 140 | ND | ND | 12 | ND | 12 | ND | 69 | 53 | 94 | 53 |
| SPCE08 | 1 | 1100 | 11 | ND | ND | ND | ND | ND | ND | ND | 24 | 6.1 | ND | 13 | ND | 3.7 | ND | ND | ND | 24 | ND |
| SPCE09 | 1 | 760 | 11 | ND | ND | ND | ND | ND | ND | ND | 130 | ND | ND | ND | ND | ND | 7.3 | 30 | 97 | 30 | 100 |
| SPCE10 | 1 | 610 | 7.8 | ND | ND | ND | ND | ND | ND | 1.2 | 550 | ND | ND | ND | 9.3 | 6.2 | 16 | 120 | 390 | 130 | 420 |
| SPCE11 | 1 | 1100 | 6 | ND | ND | ND | ND | ND | ND | ND | 440 | 7.4 | ND | 52 | 27 | 54 | 54 | 120 | 120 | 230 | 200 |
| SPCE12 | 1 | 1200 | 6.6 | ND | ND | ND | ND | ND | ND | ND | 310 | 7.5 | ND | 54 | 35 | 47 | 52 | 43 | 73 | 150 | 160 |
| SPCE13 | 1 | 950 | 6.1 | ND | ND | ND | ND | ND | ND | ND | 320 | 12 | ND | 76 | 45 | 60 | 69 | 32 | 26 | 180 | 140 |
| SPCE14 | 1 | 780 | 7 | ND | ND | ND | ND | ND | ND | ND | 130 | 3.1 | ND | 13 | ND | 18 | ND | 68 | 26 | 100 | 26 |
| SPCE15 | 1 | 670 | 5.9 | ND | ND | ND | ND | ND | ND | ND | 91 | 15 | ND | 63 | 14 | ND | ND | ND | ND | 78 | 14 |
| TP040 | 0.1 | | 8.7 | ND | ND | ND | ND | ND | 1.8 | ND | 410 | ND | ND | ND | 11 | 6 | 16 | 140 | 230 | 150 | 250 |
| TP042 | 0.1 | 760 | 9 | ND | ND | ND | ND | ND | ND | ND | 130 | ND | ND | ND | ND | ND | 7.4 | 46 | 80 | 46 | 87 |
| TP047 | 0.1 | 320 | 10 | ND | ND | ND | ND | ND | ND | ND | 51 | ND | ND | 9.7 | ND | 10 | ND | 30 | ND | 51 | ND |
| TP048 | 0.1 | 750 | 22 | ND | ND | ND | ND | ND | ND | ND | | | | | | | | | | | |
| TP054 | 0.1 | 790 | 8.5 | ND | ND | ND | ND | ND | ND | ND | 480 | ND | ND | 9.4 | ND | 23 | 20 | 150 | 280 | 180 | 300 |
| TP060 | 0.1 | 2800 | 14 | ND | ND | ND | ND | ND | ND | ND | 130 | ND | ND | ND | ND | ND | ND | 60 | 69 | 60 | 69 |
| TP061 | 0.1 | 730 | 8.6 | ND | ND | ND | ND | ND | ND | ND | 120 | ND | ND | ND | ND | ND | ND | 40 | 80 | 40 | 80 |
| TP062 | 0.1 | 490 | 14 | ND | ND | ND | ND | ND | | | | | | | | | | | | | |
| | 0.7 | 670 | 11 | ND | ND | ND | ND | ND | ND | ND | 38 | 9.7 | ND | 29 | ND | ND | ND | ND | ND | 38 | ND |
| | 1.2 | | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP068 | 0.1 | 720 | 7.4 | ND | ND | ND | ND | ND | ND | ND | 280 | ND | ND | 13 | 12 | 21 | 23 | 83 | 130 | 120 | 160 |
| | 0.5 | 510 | 7.3 | ND | ND | ND | ND | ND | ND | ND | 150 | ND | ND | 8.3 | 6.8 | 13 | 16 | 41 | 66 | 63 | 88 |
| TP069 | 0.1 | 860 | 9 | ND | ND | ND | ND | ND | ND | ND | 110 | 3.2 | ND | 7.5 | ND | 7.2 | ND | 46 | 47 | 65 | 47 |
| TP070 | 0.1 | 800 | 6.2 | ND | ND | ND | ND | ND | ND | ND | 380 | ND | ND | 5.3 | ND | 15 | 16 | 160 | 190 | 180 | 200 |
| TP078 | 0.1 | 690 | 13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 760 | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP079 | 0.1 | 740 | 8.8 | ND | ND | ND | ND | ND | ND | ND | 220 | ND | ND | 4.5 | ND | 12 | 11 | 86 | 110 | 100 | 120 |
| TP080 | 0.1 | 1200 | 15 | ND | ND | ND | ND | ND | ND | ND | 350 | 38 | 9.2 | 82 | 25 | 15 | 13 | 64 | 100 | 200 | 140 |
| | 0.7 | 720 | 11 | ND | ND | ND | ND | ND | ND | ND | 890 | 270 | 27 | 430 | 120 | 9.8 | 12 | ND | ND | 730 | 170 |
| | 1.2 | 740 | 11 | ND | ND | ND | ND | ND | ND | ND | 2000 | 650 | 69 | 920 | 250 | 17 | 12 | ND | ND | 1700 | 330 |
| TP087 | 0.1 | 780 | 15 | ND | ND | ND | ND | ND | ND | ND | 120 | ND | ND | ND | ND | ND | ND | 49 | 67 | 49 | 67 |
| TP088 | 0.1 | 1000 | 18 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP089 | 0.1 | 680 | 7.8 | ND | ND | ND | ND | ND | ND | 2.7 | 150 | ND | ND | 3.7 | ND | 12 | 7.4 | 64 | 62 | 79 | 68 |
| TP090 | 0.1 | 880 | 9.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 850 | 11 | ND | ND | ND | ND | ND | ND | ND | 550 | 160 | 10 | 280 | 74 | 9 | 8.3 | ND | ND | 460 | 92 |
| | 1.2 | 710 | 9.5 | ND | ND | ND | ND | ND | ND | ND | 190 | 44 | 2.7 | 100 | 21 | 3.3 | 4.2 | ND | ND | 160 | 29 |
| TP098 | 0.1 | 930 | 18 | ND | ND | ND | ND | ND | ND | ND | 27 | ND | ND | ND | ND | ND | ND | ND | 27 | ND | 27 |
| TP100 | 0.1 | 790 | 29 | ND | ND | ND | ND | ND | ND | ND | 250 | 3.8 | ND | 8.9 | ND | 18 | ND | 140 | 82 | 180 | 82 |
| | 0.7 | 840 | 7.5 | ND | ND | ND | ND | ND | ND | ND | 23 | 5.4 | ND | 18 | ND | ND | ND | ND | ND | 23 | ND |
| TP101 | 0.1 | 570 | 7.6 | ND | ND | ND | ND | ND | ND | ND | 100 | ND | ND | ND | ND | 2.2 | ND | 53 | 47 | 55 | 47 |
| TP107 | 0.1 | 940 | 12 | ND | ND | ND | ND | ND | ND | ND | 340 | ND | ND | 9.7 | 4.5 | 23 | 16 | 110 | 180 | 140 | 200 |
| TP108 | 0.1 | 770 | 13 | ND | ND | ND | ND | ND | ND | ND | 490 | 2.3 | ND | 6 | ND | 14 | 11 | 220 | 250 | 230 | 260 |
| TP109 | 0.1 | 590 | 7.9 | ND | ND | ND | ND | ND | ND | ND | 170 | ND | ND | 3.3 | ND | 15 | 8.4 | 87 | 56 | 100 | 65 |
| TP110 | 0.1 | 800 | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 650 | 13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 780 | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP111 | 0.1 | 910 | 15 | ND | ND | ND | ND | ND | ND | ND | 260 | 48 | ND | 130 | 16 | 22 | ND | 45 | ND | 250 | 16 |

| fk_location | Depth | RISK_TPH_C5_C7_ARO | RISK_TPH_C6_C8_ALI | RISK_TPH_C7_C8_AROM | RISK_TPH_C8_C10_ALI | RISK_TPH_C8_C10_AROM | SEC_BUTYLBENZENE | STONES | STYRENE | TERPHENYL_D14 | TERT_BUTYLBENZENE | TETRACHLOROETHENE | TOLUENE | TOLUENE_D8 | TOTAL_ARSENIC | TOTAL_BORON |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CE04 | 1 | ND | 0.18 | ND | ND | ND | ND | 5.8 | ND | 62 | ND | ND | ND | 100 | | |
| CE05 | 1 | ND | ND | ND | 0.18 | ND | ND | 6.6 | ND | 88 | ND | ND | ND | 100 | | |
| CE06B | 1 | ND | ND | ND | 21 | 0.26 | ND | 5.3 | ND | 82 | ND | ND | ND | 100 | | |
| CE06N | 1 | ND | ND | ND | 0.13 | ND | ND | 25 | ND | 84 | ND | ND | ND | 100 | | |
| CE06S | 1 | ND | ND | ND | 0.21 | ND | ND | 1.7 | ND | 73 | ND | ND | ND | 100 | | |
| CE07 | 3 | ND | ND | ND | 4.7 | 0.14 | ND | 3.4 | ND | 61 | ND | ND | ND | 100 | | |
| CE08 | 3 | ND | ND | ND | 0.24 | ND | ND | 6 | ND | 89 | ND | ND | ND | 100 | | |
| CE09 | 3 | ND | ND | ND | 1 | ND | ND | 30 | ND | 83 | ND | ND | ND | 97 | | |
| CE10 | 3 | ND | ND | ND | ND | ND | ND | 5.2 | ND | 74 | ND | ND | ND | 99 | | |
| CEO1N | 0.5 | ND | ND | 0.063 | 0.23 | ND | ND | 22 | ND | 79 | ND | ND | ND | 96 | 7.9 | 0.76 |
| CEO1S | 0.5 | ND | ND | 0.014 | 0.53 | ND | ND | 5.8 | ND | 80 | ND | ND | ND | 99 | 6.3 | 0.39 |
| CEO2N | 1.5 | ND | ND | 0.014 | 1.7 | ND | ND | 3.8 | ND | 79 | ND | ND | ND | 100 | 18 | 0.77 |
| CEO2S | 1.5 | ND | ND | 0.017 | 0.42 | ND | ND | 4.3 | ND | 82 | ND | ND | ND | 100 | 9 | 0.53 |
| CEO3 | 1 | ND | ND | ND | 0.12 | ND | ND | 6.8 | ND | 79 | ND | ND | ND | 98 | 7 | |
| MS189 | 1.5 | ND | ND | ND | 0.13 | ND | ND | 11 | ND | 73 | ND | ND | ND | 100 | 9.4 | ND |
| SPCE01 | 1 | ND | ND | ND | 0.14 | ND | ND | 11 | ND | 87 | ND | ND | ND | 100 | | |
| SPCE01D | 2 | ND | ND | ND | 0.13 | ND | ND | 1.7 | ND | 100 | ND | ND | ND | 98 | | |
| SPCE02 | 1 | ND | ND | ND | 0.18 | ND | ND | 3.2 | ND | 89 | ND | ND | ND | 100 | | |
| SPCE02D | 2 | ND | ND | ND | ND | ND | ND | 0.58 | ND | 95 | ND | ND | ND | 98 | | |
| SPCE03 | 1 | ND | ND | ND | 0.2 | ND | ND | 0.79 | ND | 97 | ND | ND | ND | 97 | | |
| SPCE03D | 2 | ND | ND | ND | ND | ND | ND | 5 | ND | 93 | ND | ND | ND | 98 | | |
| SPCE04 | 1 | ND | ND | ND | ND | ND | ND | 2.2 | ND | 80 | ND | ND | ND | 100 | | |
| SPCE05 | 1 | ND | ND | ND | ND | ND | ND | 1.8 | ND | 86 | ND | ND | ND | 96 | | |
| SPCE06 | 1 | ND | ND | ND | ND | ND | ND | 3.7 | ND | 97 | ND | ND | ND | 96 | | |
| SPCE07 | 1 | ND | 0.28 | 0.011 | 0.19 | ND | ND | 9.7 | ND | 63 | ND | ND | ND | 99 | | |
| SPCE08 | 1 | ND | ND | ND | 0.33 | ND | ND | 1.3 | ND | 87 | ND | ND | ND | 98 | | |
| SPCE09 | 1 | ND | 0.12 | ND | 0.12 | ND | ND | 0.9 | ND | 97 | ND | ND | ND | 100 | | |
| SPCE10 | 1 | ND | 0.23 | ND | 0.14 | ND | ND | 1.4 | ND | 85 | ND | ND | ND | 99 | | |
| SPCE11 | 1 | ND | 0.18 | ND | 0.21 | ND | ND | 6.1 | ND | 100 | ND | ND | ND | 99 | | |
| SPCE12 | 1 | ND | ND | ND | 0.2 | ND | ND | 4.8 | ND | 98 | ND | ND | ND | 98 | | |
| SPCE13 | 1 | ND | ND | ND | 0.27 | ND | ND | 5 | ND | 100 | ND | ND | ND | 97 | | |
| SPCE14 | 1 | ND | ND | ND | 0.11 | ND | ND | 2.4 | ND | 86 | ND | ND | ND | 98 | | |
| SPCE15 | 1 | ND | 0.29 | ND | 0.2 | ND | ND | 2.2 | ND | 80 | ND | ND | ND | 100 | | |
| TP040 | 0.1 | ND | ND | ND | ND | ND | ND | 8.5 | ND | 79 | ND | ND | ND | 98 | | |
| TP042 | 0.1 | ND | ND | 0.027 | ND | ND | ND | 30 | ND | 98 | ND | ND | ND | 93 | | |
| TP047 | 0.1 | ND | 0.13 | 0.016 | 0.12 | ND | ND | 17 | ND | 92 | ND | ND | ND | 92 | 11 | |
| TP048 | 0.1 | | | | | | ND | 37 | ND | 90 | ND | ND | ND | 97 | | |
| TP054 | 0.1 | ND | ND | ND | 0.13 | ND | ND | 18 | ND | 130 | ND | ND | ND | 92 | | |
| TP060 | 0.1 | ND | ND | ND | 0.14 | ND | ND | 22 | ND | 86 | ND | ND | ND | 99 | | |
| TP061 | 0.1 | ND | ND | 0.014 | 0.19 | ND | ND | 21 | ND | 120 | ND | ND | ND | 91 | | |
| TP062 | 0.1 | | | | | | ND | 23 | ND | | ND | ND | ND | 96 | | |
| | 0.7 | ND | ND | ND | 0.21 | ND | ND | 14 | ND | 88 | ND | ND | ND | 92 | | |
| | 1.2 | ND | ND | ND | ND | ND | ND | 3.7 | ND | 87 | ND | ND | ND | 100 | | |
| TP068 | 0.1 | ND | ND | 0.013 | ND | ND | ND | 17 | ND | 85 | ND | ND | ND | 99 | | |
| | 0.5 | ND | ND | 0.014 | 0.15 | ND | ND | 17 | ND | 100 | ND | ND | ND | 92 | | |
| TP069 | 0.1 | ND | ND | 0.038 | ND | ND | ND | 24 | ND | 100 | ND | ND | ND | 93 | | |
| TP070 | 0.1 | ND | ND | 0.031 | 0.12 | ND | ND | 20 | ND | 87 | ND | ND | ND | 93 | | |
| TP078 | 0.1 | ND | ND | ND | ND | ND | ND | 5.6 | ND | 71 | ND | ND | ND | 100 | | |
| | 0.7 | ND | ND | ND | 0.13 | ND | ND | 24 | ND | 91 | ND | ND | ND | 99 | | |
| TP079 | 0.1 | ND | ND | 0.015 | ND | ND | ND | 27 | ND | 85 | ND | ND | ND | 98 | | |
| TP080 | 0.1 | ND | ND | ND | 3.3 | ND | ND | 20 | ND | 92 | ND | ND | ND | 93 | | |
| | 0.7 | ND | ND | ND | 27 | 0.18 | 0.1 | 3.8 | ND | 91 | ND | ND | ND | 94 | | |
| | 1.2 | ND | 0.31 | ND | 97 | 0.29 | ND | 9.5 | ND | 100 | ND | ND | ND | 98 | | |
| TP087 | 0.1 | ND | ND | ND | 0.14 | ND | ND | 12 | ND | 54 | ND | ND | ND | 100 | | |
| TP088 | 0.1 | ND | ND | 0.02 | ND | ND | ND | 6.1 | ND | 86 | ND | ND | ND | 94 | | |
| TP089 | 0.1 | ND | ND | ND | ND | ND | ND | 39 | ND | 74 | ND | ND | ND | 100 | | |
| TP090 | 0.1 | ND | ND | ND | ND | ND | ND | 18 | ND | 90 | ND | ND | ND | 93 | | |
| | 0.7 | ND | ND | ND | 16 | ND | ND | 10 | ND | 84 | ND | ND | ND | 94 | | |
| | 1.2 | ND | ND | ND | 13 | ND | ND | 20 | ND | 57 | ND | ND | ND | 100 | | |
| TP098 | 0.1 | ND | ND | ND | 0.82 | ND | ND | 4.5 | ND | 87 | ND | ND | ND | 100 | | |
| TP100 | 0.1 | ND | ND | ND | 0.15 | ND | ND | 18 | ND | 93 | ND | ND | ND | 91 | | |
| | 0.7 | ND | ND | ND | 0.14 | ND | ND | 20 | ND | 76 | ND | ND | ND | 100 | | |
| TP101 | 0.1 | ND | ND | ND | ND | ND | ND | 24 | ND | 100 | ND | ND | ND | 98 | 7.9 | 0.3 |
| TP107 | 0.1 | ND | ND | 0.014 | 0.25 | ND | ND | 21 | ND | 100 | ND | ND | ND | 93 | | |
| TP108 | 0.1 | ND | ND | ND | 0.15 | ND | ND | 5.7 | ND | 79 | ND | ND | ND | 99 | | |
| TP109 | 0.1 | ND | ND | 0.022 | ND | ND | ND | 23 | ND | 85 | ND | ND | ND | 94 | 14 | 0.59 |
| TP110 | 0.1 | ND | ND | ND | ND | ND | ND | 4 | ND | 82 | ND | ND | ND | 100 | | |
| | 0.7 | ND | ND | ND | ND | ND | ND | 6.7 | ND | 84 | ND | ND | ND | 100 | | |
| | 1.4 | ND | ND | ND | ND | ND | ND | 16 | ND | 85 | ND | ND | ND | 99 | | |
| TP111 | 0.1 | ND | ND | ND | 0.44 | ND | ND | 5.8 | ND | 85 | ND | ND | ND | 97 | 22 | 0.47 |

| fk_location | Depth | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | TRANS_1_2_DICHLOROETHENE | TRANS_1_3_DICHLOROPROPENE | TRICHLOROETHENE | TRICHLOROFLUOROMETHANE | VINYL_CHLORIDE | TPH_C16_C21_6SPLIT | TPH_C8_C10_6SPLIT | TPH_C6_C8_6SPLIT | TPH_C21_C40_6SPLIT | TPH_C12_C16_6SPLIT | TPH_C10_C12_6SPLIT | TOTAL_TPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CE04 | 1 | 0.8 | 17 | 57 | 170 | ND | 24 | 0.31 | 20 | 290 | ND | ND | 0.071 | ND | ND | | | | | | | |
| CE05 | 1 | ND | 18 | 50 | 58 | ND | 22 | 0.41 | 24 | 180 | ND | ND | 0.052 | ND | ND | | | | | | | |
| CE06B | 1 | ND | 11 | 14 | 15 | ND | 27 | ND | 18 | 65 | ND | ND | 0.011 | ND | ND | | | | | | | |
| CE06N | 1 | ND | 12 | 16 | 13 | ND | 29 | ND | 20 | 64 | ND | ND | 0.024 | ND | ND | | | | | | | |
| CE06S | 1 | ND | 16 | 48 | 53 | ND | 22 | 0.43 | 25 | 160 | ND | ND | 0.0061 | ND | ND | | | | | | | |
| CE07 | 3 | ND | 15 | 24 | 22 | ND | 20 | ND | 22 | 77 | ND | ND | 0.028 | ND | ND | | | | | | | |
| CE08 | 3 | ND | 13 | 14 | 22 | ND | 13 | 0.39 | 26 | 55 | ND | ND | 0.019 | ND | ND | | | | | | | |
| CE09 | 3 | ND | 12 | 22 | 19 | ND | 31 | ND | 19 | 73 | ND | ND | 0.013 | ND | ND | | | | | | | |
| CE10 | 3 | ND | 14 | 14 | 18 | ND | 18 | 0.43 | 22 | 71 | ND | ND | 0.011 | ND | ND | | | | | | | |
| CEO1N | 0.5 | ND | 12 | 25 | 19 | ND | 32 | ND | 17 | 84 | ND | ND | ND | ND | ND | | | | | | | |
| CEO1S | 0.5 | ND | 13 | 39 | 16 | ND | 25 | 0.68 | 19 | 110 | ND | ND | ND | ND | ND | | | | | | | |
| CEO2N | 1.5 | 0.69 | 16 | 62 | 40 | ND | 23 | 0.36 | 25 | 160 | ND | ND | ND | ND | ND | | | | | | | |
| CEO2S | 1.5 | ND | 16 | 26 | 21 | ND | 25 | 0.36 | 24 | 180 | ND | ND | 0.006 | ND | ND | | | | | | | |
| CEO3 | 1 | ND | 16 | 35 | 19 | ND | 25 | ND | 22 | 88 | ND | ND | 0.0095 | ND | ND | | | | | | | |
| MS189 | 1.5 | ND | 11 | 20 | 17 | ND | 24 | ND | 22 | 74 | ND | ND | 0.035 | ND | ND | | | | | | | |
| SPCE01 | 1 | 1.1 | 14 | 140 | 94 | 0.28 | 21 | 0.68 | 24 | 160 | ND | ND | 0.013 | ND | ND | | | | | | | |
| SPCE01D | 2 | 1.1 | 15 | 100 | 65 | ND | 23 | 0.61 | 23 | 160 | ND | ND | 0.016 | ND | ND | | | | | | | |
| SPCE02 | 1 | 0.87 | 32 | 100 | 86 | 0.25 | 20 | 0.57 | 39 | 180 | ND | ND | ND | ND | ND | | | | | | | |
| SPCE02D | 2 | 1.2 | 15 | 130 | 58 | ND | 22 | 0.67 | 22 | 130 | ND | ND | 0.0078 | ND | ND | | | | | | | |
| SPCE03 | 1 | 1.1 | 15 | 120 | 76 | ND | 22 | 0.67 | 24 | 150 | ND | ND | ND | ND | ND | | | | | | | |
| SPCE03D | 2 | 0.96 | 14 | 110 | 52 | ND | 27 | 0.61 | 21 | 140 | ND | ND | ND | ND | ND | | | | | | | |
| SPCE04 | 1 | ND | 14 | 28 | 25 | ND | 30 | 0.45 | 18 | 100 | ND | ND | 0.018 | ND | ND | | | | | | | |
| SPCE05 | 1 | ND | 16 | 23 | 24 | ND | 32 | ND | 18 | 94 | ND | ND | 0.0078 | ND | ND | | | | | | | |
| SPCE06 | 1 | ND | 13 | 15 | 16 | ND | 28 | 0.37 | 16 | 75 | ND | ND | 0.0087 | ND | ND | | | | | | | |
| SPCE07 | 1 | ND | 27 | 51 | 48 | ND | 41 | 0.32 | 22 | 140 | ND | ND | 0.0065 | ND | ND | | | | | | | |
| SPCE08 | 1 | ND | 16 | 39 | 50 | 0.3 | 37 | ND | 22 | 120 | ND | ND | ND | ND | ND | | | | | | | |
| SPCE09 | 1 | 0.57 | 17 | 55 | 120 | 0.29 | 26 | 0.43 | 19 | 200 | ND | ND | 0.0069 | ND | ND | | | | | | | |
| SPCE10 | 1 | 0.69 | 16 | 34 | 190 | ND | 19 | ND | 14 | 310 | ND | ND | 0.015 | ND | ND | | | | | | | |
| SPCE11 | 1 | ND | 17 | 96 | 47 | 0.34 | 73 | 0.45 | 22 | 130 | ND | ND | 0.014 | ND | ND | | | | | | | |
| SPCE12 | 1 | ND | 20 | 46 | 42 | ND | 50 | ND | 28 | 130 | ND | ND | 0.018 | ND | ND | | | | | | | |
| SPCE13 | 1 | ND | 19 | 50 | 54 | ND | 57 | 0.3 | 25 | 140 | ND | ND | 0.017 | ND | ND | | | | | | | |
| SPCE14 | 1 | ND | 17 | 27 | 21 | ND | 45 | ND | 20 | 100 | ND | ND | 0.022 | ND | ND | | | | | | | |
| SPCE15 | 1 | ND | 16 | 16 | 16 | ND | 50 | ND | 18 | 80 | ND | ND | 0.036 | ND | ND | | | | | | | |
| TP040 | 0.1 | | | | | | | | | | ND | ND | ND | ND | ND | | | | | | | |
| TP042 | 0.1 | ND | 15 | 17 | 15 | ND | 31 | ND | 21 | 88 | ND | ND | ND | ND | ND | | | | | | | |
| TP047 | 0.1 | ND | 12 | 34 | 80 | 0.43 | 21 | ND | 15 | 280 | ND | ND | 0.013 | ND | ND | | | | | | | |
| TP048 | 0.1 | 2.3 | 19 | 130 | 2500 | ND | 34 | 1 | 21 | 3600 | ND | ND | ND | ND | ND | ND | 1.7 | ND | 29 | 3 | ND | 35 |
| TP054 | 0.1 | 0.65 | 21 | 56 | 150 | 0.27 | 30 | ND | 22 | 240 | ND | ND | ND | ND | ND | | | | | | | |
| TP060 | 0.1 | 0.63 | 16 | 33 | 79 | 0.52 | 40 | ND | 21 | 190 | ND | ND | ND | ND | ND | | | | | | | |
| TP061 | 0.1 | ND | 17 | 35 | 220 | ND | 34 | ND | 19 | 200 | ND | ND | ND | ND | ND | | | | | | | |
| TP062 | 0.1 | ND | 16 | 32 | 21 | ND | 19 | 0.33 | 24 | 64 | ND | ND | ND | ND | ND | 24 | ND | ND | ## | 38 | 14 | ## |
| | 0.7 | ND | 13 | 31 | 19 | ND | 26 | ND | 18 | 75 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.2 | | | | | | | | | | ND | ND | ND | ND | ND | | | | | | | |
| TP068 | 0.1 | ND | 32 | 54 | 140 | ND | 48 | ND | 25 | 310 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.5 | ND | 20 | 37 | 40 | ND | 51 | ND | 19 | 140 | ND | ND | ND | ND | ND | | | | | | | |
| TP069 | 0.1 | ND | 19 | 32 | 80 | ND | 45 | ND | 24 | 130 | ND | ND | ND | ND | ND | | | | | | | |
| TP070 | 0.1 | ND | 15 | 34 | 65 | 0.43 | 22 | 0.31 | 17 | 130 | ND | ND | ND | ND | ND | | | | | | | |
| TP078 | 0.1 | ND | 13 | 22 | 20 | ND | 27 | 0.4 | 20 | 89 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 0.52 | 29 | 62 | 210 | 0.46 | 36 | 0.4 | 24 | 260 | ND | ND | ND | ND | ND | | | | | | | |
| TP079 | 0.1 | ND | 20 | 35 | 120 | 0.31 | 54 | ND | 20 | 180 | ND | ND | ND | ND | ND | | | | | | | |
| TP080 | 0.1 | 1.2 | 25 | 550 | 140 | 0.29 | 26 | 0.41 | 33 | 370 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | ND | 16 | 18 | 18 | ND | 25 | ND | 22 | 62 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.2 | ND | 11 | 16 | 48 | ND | 25 | ND | 17 | 61 | ND | ND | ND | ND | ND | | | | | | | |
| TP087 | 0.1 | ND | 19 | 38 | 41 | ND | 32 | 0.49 | 25 | 150 | ND | ND | ND | ND | ND | | | | | | | |
| TP088 | 0.1 | 0.81 | 17 | 100 | 110 | 0.25 | 30 | 0.52 | 28 | 200 | ND | ND | ND | ND | ND | | | | | | | |
| TP089 | 0.1 | ND | 21 | 46 | 180 | ND | 38 | ND | 20 | 210 | ND | ND | ND | ND | ND | | | | | | | |
| TP090 | 0.1 | ND | 13 | 17 | 16 | ND | 37 | ND | 20 | 83 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | ND | 12 | 18 | 21 | ND | 31 | ND | 19 | 77 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.2 | ND | 12 | 36 | 38 | ND | 25 | ND | 18 | 100 | ND | ND | ND | ND | ND | | | | | | | |
| TP098 | 0.1 | 1.2 | 17 | 110 | 140 | ND | 27 | 0.66 | 25 | 570 | ND | ND | ND | ND | ND | | | | | | | |
| TP100 | 0.1 | ND | 17 | 51 | 75 | ND | 31 | 0.37 | 22 | 190 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | ND | 11 | 22 | 22 | ND | 29 | ND | 17 | 80 | ND | ND | ND | ND | ND | | | | | | | |
| TP101 | 0.1 | ND | 12 | 18 | 15 | ND | 27 | ND | 18 | 68 | ND | ND | 0.04 | ND | ND | | | | | | | |
| TP107 | 0.1 | 1.4 | 32 | 720 | 410 | 0.6 | 39 | 0.42 | 28 | 830 | ND | ND | ND | ND | ND | | | | | | | |
| TP108 | 0.1 | ND | 13 | 43 | 65 | ND | 24 | 0.34 | 17 | 280 | ND | ND | ND | ND | ND | | | | | | | |
| TP109 | 0.1 | ND | 19 | 55 | 130 | 0.32 | 39 | ND | 20 | 240 | ND | ND | ND | ND | ND | | | | | | | |
| TP110 | 0.1 | ND | 20 | 28 | 52 | ND | 31 | ND | 19 | 130 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | ND | 15 | 16 | 19 | ND | 30 | ND | 22 | 68 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | ND | 13 | 14 | 16 | ND | 29 | 0.32 | 18 | 65 | ND | ND | ND | ND | ND | | | | | | | |
| TP111 | 0.1 | ND | 14 | 45 | 47 | ND | 21 | 0.36 | 22 | 130 | ND | ND | 0.034 | ND | ND | | | | | | | |

TABLE B: Area 1 Phase 2 Validation Analytical Data

| fk_location | Depth | MANGANESE | MOISTURE | N_BUTYLBENZENE | N_PROPYLBENZENE | NAPHTHALENE | O_XYLENE | P_ISOPROPYLTOLUENE | PHENANTHRENE | PYRENE | RISK_EPH_C5_C44 | RISK_TPH_C10_C12_ALI | RISK_TPH_C10_C12_AROM | RISK_TPH_C12_C16_ALI | RISK_TPH_C12_C16_AROM | RISK_TPH_C16_C21_ALI | RISK_TPH_C16_C21_AROM | RISK_TPH_C21_C40_ALI | RISK_TPH_C21_C40_AROM | RISK_TPH_C5_C44_ALI | RISK_TPH_C5_C44_ARO | RISK_TPH_C5_C7_ARO | RISK_TPH_C6_C8_ALI | RISK_TPH_C7_C8_AROM | RISK_TPH_C8_C10_ALI | RISK_TPH_C8_C10_AROM | SEC_BUTYLBENZENE | STONES | STYRENE | TERPHENYL_D14 | TERT_BUTYLBENZENE | TETRACHLOROETHENE | TOLUENE | TOLUENE_D8 | TOTAL_ARSENIC | TOTAL_BORON | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | TRANS_1_2_DICHLOROETHENE | TRANS_1_3_DICHLOROPROPENE | TRICHLOROETHENE | TRICHLOROFLUOROMETHANE | VINYL_CHLORIDE | TPH_C16_C21_6SPLIT | TPH_C8_C10_6SPLIT | TPH_C6_C8_6SPLIT | TPH_C21_C40_6SPLIT | TPH_C12_C16_6SPLIT | TPH_C10_C12_6SPLIT | TOTAL_TPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0.7 | 1000 | 16 | ND | ND | ND | ND | ND | ND | ND | 1000 | 330 | 14 | 550 | 110 | 23 | 17 | 13 | ND | 920 | 140 | ND | ND | ND | 5.5 | 0.17 | ND | 7.6 | ND | 85 | ND | ND | ND | 99 | 11 | 0.78 | ND | 14 | 26 | 26 | ND | 15 | 0.33 | 23 | 67 | ND | ND | 0.037 | ND | ND | | | | | | | | | |
| | 1.4 | 790 | 7.6 | ND | ND | ND | ND | ND | ND | ND | 470 | 140 | 17 | 230 | 65 | 6.9 | 7 | ND | ND | 380 | 89 | ND | ND | ND | 3.8 | 0.15 | ND | 15 | ND | 85 | ND | ND | ND | 100 | 9.6 | 0.4 | ND | 12 | 16 | 13 | ND | 27 | ND | 19 | 65 | ND | ND | 0.032 | ND | ND | | | | | | | | | |
| **TP119** | 0.1 | 570 | 11 | ND | ND | ND | ND | ND | ND | ND | 160 | 10 | ND | 36 | ND | 18 | ND | 49 | 46 | 110 | 46 | ND | ND | 0.013 | 0.16 | ND | ND | 19 | ND | 89 | ND | ND | ND | 100 | | | ND | 16 | 44 | 46 | ND | 64 | ND | 19 | 130 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP120** | 0.1 | 850 | 12 | ND | ND | ND | ND | ND | ND | ND | 24 | ND | ND | ND | ND | ND | ND | 24 | ND | 24 | ND | ND | ND | ND | ND | ND | ND | 13 | ND | 87 | ND | ND | ND | 99 | | | 34 | 25 | 53 | 73 | ND | 32 | ND | 24 | 170 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP121** | 0.1 | 590 | 11 | ND | ND | ND | ND | ND | ND | ND | 70 | ND | ND | 2.5 | ND | 5.5 | ND | 28 | 33 | 36 | 33 | ND | ND | ND | ND | ND | ND | 35 | ND | 90 | ND | ND | ND | 100 | | | ND | 22 | 45 | 170 | 0.36 | 49 | 0.52 | 22 | 300 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP122** | 0.1 | 760 | 21 | ND | ND | ND | ND | ND | ND | ND | 350 | 82 | 9.5 | 140 | 32 | 5.8 | 5.1 | 33 | 46 | 270 | 91 | ND | ND | 2 | ND | ND | 13 | ND | 92 | ND | ND | ND | 100 | 18 | 0.52 | ND | 14 | 46 | 37 | ND | 21 | 0.38 | 22 | 110 | ND | ND | 0.034 | ND | ND | | | | | | | | | |
| **TP130** | 0.1 | 820 | 12 | ND | ND | ND | ND | ND | ND | ND | 1100 | 4.8 | ND | 40 | 24 | 58 | 73 | 350 | 590 | 450 | 690 | 0.014 | ND | 0.024 | 0.31 | ND | ND | 38 | ND | 87 | ND | ND | ND | 99 | | | 0.99 | 27 | 260 | 400 | 0.71 | 43 | 0.43 | 30 | 720 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP131** | 0.1 | 940 | 11 | ND | ND | ND | ND | ND | ND | ND | 200 | ND | ND | 6.7 | ND | 11 | 9.1 | 79 | 100 | 97 | 110 | ND | ND | 0.013 | 0.11 | ND | ND | 11 | ND | 83 | ND | ND | ND | 99 | | | ND | 22 | 82 | 120 | ND | 36 | ND | 22 | 200 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP132** | 0.1 | 660 | 12 | ND | ND | ND | ND | ND | ND | ND | 670 | 7.7 | ND | 33 | 7.5 | 33 | 22 | 250 | 310 | 330 | 340 | ND | ND | ND | ND | ND | ND | 7.9 | ND | 79 | ND | ND | ND | 99 | | | ND | 15 | 31 | 15 | ND | 29 | 0.74 | 21 | 83 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 0.7 | 570 | 13 | ND | ND | ND | ND | ND | ND | ND | 53 | ND | ND | ND | ND | ND | ND | 23 | 29 | 23 | 29 | ND | ND | ND | 0.13 | ND | ND | 20 | ND | 88 | ND | ND | ND | 100 | | | 0.62 | 17 | 81 | 120 | 0.4 | 32 | 0.4 | 25 | 160 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP133** | 0.1 | 890 | 17 | ND | ND | ND | ND | ND | ND | ND | 110 | 19 | ND | 17 | ND | 3.9 | ND | 30 | 41 | 71 | 41 | ND | ND | ND | 0.66 | ND | ND | 20 | ND | 75 | ND | ND | ND | 100 | | | 0.97 | 43 | 360 | 630 | 1.3 | 37 | 0.37 | 34 | 1400 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 0.7 | 700 | 13 | ND | ND | ND | ND | ND | ND | ND | 150 | 38 | ND | 95 | 13 | 2.6 | ND | ND | ND | 140 | 13 | ND | ND | ND | 1.4 | ND | ND | 6.2 | ND | 84 | ND | ND | ND | 100 | | | ND | 16 | 17 | 19 | ND | 22 | ND | 21 | 58 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 1.5 | 1000 | 11 | ND | ND | ND | ND | ND | ND | ND | 74 | 25 | ND | 43 | 7.1 | ND | ND | ND | ND | 67 | 7.1 | ND | ND | ND | 0.46 | ND | ND | 23 | ND | 85 | ND | ND | ND | 100 | | | ND | 12 | 20 | 28 | ND | 25 | ND | 20 | 81 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP134** | 0.1 | 1200 | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 8.6 | ND | 73 | ND | ND | ND | 99 | | | ND | 13 | 26 | 19 | ND | 16 | 0.64 | 22 | 160 | ND | ND | 0.035 | ND | ND | | | | | | | | | |
| | 0.7 | 1700 | 15 | ND | ND | ND | ND | ND | 2 | 11 | 330 | ND | ND | 4.4 | 12 | 6 | 60 | 14 | 240 | 25 | 310 | ND | ND | ND | ND | ND | ND | 4.6 | ND | 71 | ND | ND | ND | 99 | | | ND | 15 | 62 | 45 | ND | 18 | 0.69 | 26 | 150 | ND | ND | 0.029 | ND | ND | | | | | | | | | |
| | 1.4 | 1200 | 7.5 | ND | ND | ND | ND | ND | ND | ND | 28 | ND | ND | ND | ND | ND | 4.8 | ND | 24 | ND | 28 | ND | ND | ND | ND | ND | ND | 19 | ND | 58 | ND | ND | ND | 99 | | | ND | 11 | 24 | 19 | ND | 30 | ND | 17 | 88 | ND | ND | 0.041 | ND | ND | | | | | | | | | |
| **TP141** | 0.1 | 500 | 7.9 | ND | ND | ND | ND | ND | ND | ND | 81 | ND | ND | ND | ND | ND | ND | 41 | 40 | 41 | 40 | ND | ND | 0.035 | 0.15 | ND | ND | 30 | ND | 95 | ND | ND | ND | 92 | 12 | 0.39 | ND | 18 | 33 | 51 | ND | 51 | ND | 19 | 130 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP142** | 0.1 | 630 | 8.9 | ND | ND | ND | ND | ND | ND | ND | 670 | ND | ND | 3.4 | ND | 15 | 9.7 | 300 | 340 | 310 | 350 | ND | ND | 0.015 | 0.11 | ND | ND | 30 | ND | 82 | ND | ND | ND | 99 | | | ND | 20 | 51 | 98 | 0.33 | 44 | ND | 24 | 220 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP143** | 0.1 | 990 | 12 | ND | ND | ND | ND | ND | ND | ND | 230 | ND | ND | ND | ND | 9.4 | 8.8 | 93 | 110 | 100 | 130 | ND | ND | 0.018 | 0.16 | ND | ND | 14 | ND | 62 | ND | ND | ND | 97 | 9.4 | 0.53 | ND | 19 | 43 | 63 | ND | 46 | 0.32 | 27 | 160 | ND | ND | 0.014 | ND | ND | | | | | | | | | |
| | 0.7 | 1400 | 17 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.4 | ND | 68 | ND | ND | ND | 97 | 11 | 0.62 | ND | 13 | 22 | 21 | ND | 15 | 0.31 | 21 | 130 | ND | ND | 0.025 | ND | ND | | | | | | | | | |
| | 1.4 | 1200 | 22 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.6 | ND | 94 | ND | ND | ND | 97 | 9.1 | 0.34 | ND | 14 | 23 | 25 | ND | 20 | ND | 21 | 89 | ND | ND | 0.013 | ND | ND | | | | | | | | | |
| **TP144** | 0.1 | 1200 | 13 | ND | ND | ND | ND | ND | ND | ND | 260 | 48 | 13 | 16 | 8.5 | 13 | 11 | 70 | 86 | 150 | 110 | ND | ND | ND | 1.4 | 0.4 | ND | 8.5 | ND | 71 | ND | ND | ND | 97 | | | 0.87 | 23 | 140 | 200 | 0.69 | 34 | 0.42 | 49 | 780 | ND | ND | 0.031 | ND | ND | | | | | | | | | |
| | 0.7 | 710 | 17 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.2 | ND | 73 | ND | ND | ND | 100 | | | ND | 15 | 21 | 20 | ND | 15 | 0.36 | 22 | 71 | ND | ND | 0.034 | ND | ND | | | | | | | | | |
| | 1.4 | 870 | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.1 | ND | 130 | ND | ND | ND | 99 | | | ND | 11 | 23 | 18 | ND | 22 | ND | 17 | 71 | ND | ND | 0.034 | ND | ND | | | | | | | | | |
| | 2.1 | 920 | 8.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.11 | ND | ND | 12 | ND | 63 | ND | ND | ND | 99 | | | ND | 10 | 21 | 18 | 0.25 | 28 | ND | 16 | 75 | ND | ND | 0.031 | ND | ND | | | | | | | | | |
| **TP151** | 0.1 | 400 | 8.1 | ND | ND | ND | ND | ND | ND | ND | 440 | 20 | ND | 95 | 29 | 61 | 55 | 70 | 100 | 250 | 180 | ND | ND | ND | 0.27 | ND | ND | 27 | ND | 81 | ND | ND | ND | 100 | | | ND | 17 | 46 | 35 | ND | 68 | 0.55 | 19 | 120 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP152** | 0.1 | 590 | 9.3 | ND | ND | ND | ND | ND | ND | ND | 880 | ND | ND | ND | ND | 12 | 9.6 | 450 | 410 | 460 | 420 | ND | ND | ND | ND | ND | ND | 21 | ND | 88 | ND | ND | ND | 96 | 7.8 | 0.33 | ND | 18 | 22 | 31 | ND | 40 | ND | 20 | 96 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 0.7 | 1300 | 8.5 | ND | ND | ND | ND | ND | 1.4 | 3 | 130 | ND | ND | ND | ND | ND | ND | 78 | 51 | 78 | 51 | ND | ND | ND | ND | ND | ND | 30 | ND | 88 | ND | ND | ND | 98 | 10 | 0.33 | ND | 19 | 37 | 49 | ND | 53 | ND | 23 | 890 | ND | ND | 0.0084 | ND | ND | | | | | | | | | |
| **TP153** | 0.1 | 910 | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 27 | ND | 70 | ND | ND | ND | 97 | 15 | 0.33 | ND | 17 | 47 | 49 | ND | 33 | 0.4 | 22 | 120 | ND | ND | 0.019 | ND | ND | | | | | | | | | |
| | 0.7 | 670 | 12 | ND | ND | ND | ND | ND | 1.1 | 1.4 | 480 | ND | ND | 5.5 | 6.5 | 15 | 13 | 200 | 230 | 230 | 250 | ND | 0.25 | ND | ND | ND | ND | 14 | ND | 74 | ND | ND | ND | 97 | 16 | 0.39 | 0.59 | 17 | 62 | 79 | ND | 35 | 0.37 | 22 | 180 | ND | ND | 0.014 | ND | ND | | | | | | | | | |
| | 1.4 | 730 | 9.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 7.9 | ND | 82 | ND | ND | ND | 97 | 9.7 | 0.36 | ND | 9.8 | 20 | 17 | ND | 21 | ND | 16 | 66 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP154** | 0.1 | 600 | 7.2 | ND | ND | ND | ND | ND | ND | ND | 280 | 4.4 | ND | 12 | ND | 13 | 12 | 100 | 130 | 130 | 140 | ND | 0.18 | ND | 0.24 | ND | ND | 31 | ND | 82 | ND | ND | ND | 100 | | | ND | 17 | 77 | 180 | 13 | 40 | ND | 20 | 530 | ND | ND | 0.015 | ND | ND | | | | | | | | | |
| **TP155** | 0.1 | 780 | 4.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 35 | ND | 84 | ND | ND | ND | 100 | | | ND | 12 | 21 | 14 | ND | 24 | ND | 18 | 83 | ND | ND | 0.038 | ND | ND | | | | | | | | | |
| | 0.7 | 1100 | 8.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 35 | ND | 54 | ND | ND | ND | 100 | | | ND | 11 | 21 | 16 | ND | 29 | ND | 18 | 76 | ND | ND | 0.041 | ND | ND | | | | | | | | | |
| **TP162** | 0.1 | 770 | 6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.012 | ND | ND | ND | 49 | ND | 94 | ND | ND | ND | 94 | | | ND | 16 | 33 | 24 | 0.35 | 55 | ND | 19 | 120 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP163** | 0.1 | 730 | 11 | ND | ND | ND | ND | ND | ND | ND | 84 | ND | ND | ND | ND | ND | ND | 40 | 44 | 40 | 44 | ND | ND | ND | 0.17 | ND | ND | 15 | ND | 79 | ND | ND | ND | 98 | 11 | 0.43 | ND | 16 | 36 | 53 | ND | 31 | 0.4 | 22 | 130 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 0.7 | 540 | 8.3 | ND | ND | ND | ND | ND | ND | ND | 74 | ND | ND | ND | ND | ND | ND | 36 | 38 | 36 | 38 | ND | ND | ND | ND | ND | ND | 24 | ND | 83 | ND | ND | ND | 97 | 9.1 | 0.33 | ND | 17 | 41 | 44 | ND | 38 | ND | 18 | 120 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 1.4 | 420 | 14 | ND | ND | ND | ND | ND | ND | ND | 200 | ND | ND | 4.8 | ND | 9.2 | 6.4 | 80 | 100 | 94 | 110 | ND | ND | ND | 0.13 | ND | ND | 19 | ND | 78 | ND | ND | ND | 98 | 7.2 | 0.5 | ND | 15 | 32 | 25 | ND | 28 | ND | 18 | 150 | ND | ND | 0.0062 | ND | ND | | | | | | | | | |
| **TP164** | 0.1 | 830 | 19 | ND | ND | ND | ND | ND | ND | ND | 460 | 38 | 7.4 | 150 | 74 | 65 | 88 | 15 | 20 | 270 | 190 | ND | ND | ND | 0.94 | ND | ND | 7.6 | ND | 83 | ND | ND | ND | 100 | 17 | 0.92 | ND | 14 | 43 | 33 | ND | 12 | 0.34 | 23 | 86 | ND | ND | 0.044 | ND | ND | | | | | | | | | |
| | 0.7 | 650 | 16 | ND | ND | ND | ND | ND | ND | ND | 2500 | 270 | 37 | 770 | 480 | 360 | 430 | 48 | 62 | 1400 | 1000 | ND | 0.13 | ND | 3 | ND | ND | 9.9 | ND | 96 | ND | ND | ND | 110 | 12 | 0.54 | ND | 16 | 26 | 22 | ND | 17 | 0.35 | 24 | 75 | ND | ND | 0.042 | ND | ND | | | | | | | | | |
| | 1.4 | 780 | 8.4 | ND | ND | ND | ND | ND | ND | ND | 430 | 34 | 8.1 | 120 | 68 | 60 | 87 | 17 | 20 | 240 | 190 | ND | 0.64 | ND | 6.6 | 0.14 | ND | 9.6 | ND | 74 | ND | ND | ND | 100 | 9.7 | 0.31 | ND | 12 | 20 | 19 | ND | 22 | ND | 23 | 71 | ND | ND | 0.05 | ND | ND | | | | | | | | | |
| **TP165** | 0.1 | 670 | 9.6 | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | 11 | ND | 50 | 12 | 21 | 17 | 82 | 28 | ND | ND | ND | ND | ND | ND | 7.9 | ND | 85 | ND | ND | ND | 97 | 18 | 0.38 | ND | 15 | 61 | 38 | ND | 48 | ND | 19 | 150 | ND | ND | 0.015 | ND | ND | | | | | | | | | |
| | 0.7 | 740 | 8.4 | ND | ND | ND | ND | ND | ND | ND | 2900 | 910 | 15 | 1500 | 220 | 23 | 15 | ND | ND | 2600 | 250 | ND | 1.1 | ND | 220 | ND | ND | 21 | ND | 87 | ND | ND | ND | 110 | | | ND | 13 | 30 | 92 | 0.26 | 24 | ND | 21 | 180 | ND | ND | 0.036 | ND | ND | | | | | | | | | |
| **TP173** | 0.1 | 2700 | 13 | ND | ND | ND | ND | ND | ND | ND | 6000 | 330 | 99 | 1300 | 830 | 890 | 850 | 770 | 740 | 3400 | 2500 | ND | 52 | 0.056 | 150 | 2.6 | ND | 35 | ND | 88 | ND | ND | ND | 96 | 40 | 1.1 | 1.1 | 44 | 640 | 250 | 0.3 | 58 | 0.63 | 110 | 790 | ND | ND | 0.018 | ND | ND | | | | | | | | | |
| | 0.7 | 1700 | 9.6 | ND | ND | ND | ND | ND | ND | ND | 5500 | 210 | 29 | 1400 | 590 | 1300 | 1200 | 290 | 380 | 3400 | 2200 | ND | 38 | 0.044 | 150 | 2.3 | ND | 31 | ND | 87 | ND | ND | ND | 96 | 20 | 1.1 | 0.59 | 23 | 260 | 190 | ND | 40 | 0.33 | 26 | 1100 | ND | ND | 0.01 | ND | ND | | | | | | | | | |
| | 1.4 | 520 | 6.6 | ND | ND | ND | ND | ND | ND | ND | 260 | 18 | ND | 71 | 28 | 58 | 54 | 13 | 14 | 160 | 95 | ND | ND | ND | 1.1 | ND | ND | 30 | ND | 88 | ND | ND | ND | 100 | 6.3 | 0.37 | ND | 18 | 31 | 23 | ND | 49 | ND | 19 | 94 | ND | ND | 0.009 | ND | ND | | | | | | | | | |
| **TP174** | 0.1 | 680 | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.3 | ND | 68 | ND | ND | ND | 100 | | | ND | 14 | 19 | 14 | ND | 29 | 0.36 | 18 | 69 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP175** | 0.1 | 730 | 19 | ND | ND | ND | ND | ND | ND | ND | 780 | 52 | 7 | 230 | 95 | 140 | 150 | 38 | 59 | 470 | 310 | ND | ND | ND | 0.79 | ND | ND | 3.1 | ND | 89 | ND | ND | ND | 100 | 15 | 0.33 | ND | 17 | 45 | 92 | ND | 21 | 0.45 | 24 | 170 | ND | ND | 0.02 | ND | ND | | | | | | | | | |
| | 0.7 | 1100 | 9.9 | ND | ND | ND | ND | ND | ND | ND | 120 | 7.1 | ND | 18 | 16 | 6.4 | 12 | 23 | 41 | 55 | 69 | ND | ND | ND | 0.51 | ND | ND | 3.8 | ND | 77 | ND | ND | ND | 100 | 8.8 | 0.27 | ND | 11 | 17 | 16 | ND | 22 | ND | 20 | 67 | ND | ND | 0.043 | ND | ND | | | | | | | | | |
| **TP176** | 0.1 | 980 | 16 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 1.5 | ND | 87 | ND | ND | ND | 100 | 16 | 0.48 | ND | 15 | 35 | 28 | ND | 22 | 0.43 | 22 | 100 | ND | ND | 0.038 | ND | ND | | | | | | | | | |
| | 0.7 | 880 | 9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.12 | ND | ND | 41 | ND | 87 | ND | ND | ND | 98 | 12 | 0.26 | ND | 16 | 29 | 20 | ND | 27 | 0.49 | 21 | 94 | ND | ND | 0.067 | ND | ND | | | | | | | | | |
| **TP182** | 0.1 | 690 | 7.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.8 | ND | 77 | ND | ND | ND | 97 | | | ND | 13 | 20 | 22 | ND | 28 | ND | 17 | 75 | ND | ND | 0.014 | ND | ND | | | | | | | | | |
| | 0.7 | 750 | 8.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 8.9 | ND | 70 | ND | ND | ND | 100 | | | ND | 13 | 18 | 21 | ND | 23 | 0.33 | 17 | 67 | ND | ND | 0.02 | ND | ND | | | | | | | | | |
| **TP183** | 0.1 | 1100 | 7.6 | ND | ND | ND | ND | ND | ND | ND | 610 | 7.9 | ND | 38 | 16 | 53 | 43 | 170 | 280 | 270 | 340 | ND | ND | 0.019 | 0.14 | ND | ND | 36 | ND | 75 | ND | ND | ND | 97 | 11 | 0.48 | 4.8 | 59 | 150 | 190 | ND | 39 | ND | 45 | 5400 | ND | ND | 0.018 | ND | ND | | | | | | | | | |
| | 0.7 | 650 | 5.5 | ND | ND | ND | ND | ND | ND | ND | 390 | 16 | ND | 70 | 25 | 120 | 62 | 55 | 40 | 260 | 130 | ND | ND | ND | 0.17 | ND | ND | 31 | ND | 76 | ND | ND | ND | 97 | 7 | 0.62 | ND | 19 | 33 | 35 | ND | 46 | ND | 26 | 260 | ND | ND | 0.023 | ND | ND | | | | | | | | | |
| | 1.4 | 560 | 6.8 | ND | ND | ND | ND | ND | ND | ND | 270 | 6.8 | ND | 38 | 19 | 85 | 50 | 42 | 30 | 170 | 99 | ND | ND | ND | 0.17 | ND | ND | 26 | ND | 69 | ND | ND | ND | 98 | 6.7 | 0.29 | ND | 17 | 30 | 21 | ND | 42 | ND | 18 | 160 | ND | ND | 0.026 | ND | ND | | | | | | | | | |
| **TP185** | 0.7 | 990 | 6.3 | ND | ND | ND | ND | ND | ND | ND | 68 | ND | ND | 9 | ND | 25 | 9.2 | 9.3 | 17 | 43 | 27 | ND | ND | ND | ND | ND | ND | 35 | ND | 83 | ND | ND | ND | 97 | 11 | 0.4 | ND | 18 | 45 | 34 | ND | 53 | ND | 23 | 110 | ND | ND | 0.01 | ND | ND | | | | | | | | | |
| | 1.4 | 940 | 7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 19 | ND | 86 | ND | ND | ND | 96 | 14 | 0.64 | 0.55 | 21 | 48 | 30 | ND | 64 | ND | 30 | 200 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 2.1 | 770 | 6.5 | ND | ND | ND | ND | ND | ND | ND | 430 | 22 | 6.4 | 120 | 56 | 89 | 91 | 20 | 29 | 250 | 180 | ND | ND | ND | 0.31 | ND | ND | 30 | ND | 79 | ND | ND | ND | 97 | 8.8 | 0.44 | ND | 20 | 49 | 28 | ND | 63 | ND | 20 | 260 | ND | ND | 0.0065 | ND | ND | | | | | | | | | |
| **TP186** | 0.1 | 680 | 5.9 | ND | ND | ND | ND | ND | ND | ND | 290 | 16 | 1.7 | 86 | 39 | 61 | 54 | 11 | 12 | 170 | 110 | ND | ND | ND | 1.5 | ND | ND | 39 | ND | 89 | ND | ND | ND | 99 | 3.4 | 0.33 | ND | 18 | 42 | 29 | ND | 93 | ND | 20 | 150 | ND | ND | 0.0087 | ND | ND | | | | | | | | | |
| | 0.7 | 610 | 9.5 | ND | ND | ND | ND | ND | ND | ND | 760 | 78 | 8.4 | 230 | 110 | 130 | 120 | 21 | 25 | 500 | 270 | ND | 1 | ND | 22 | 0.24 | ND | 27 | ND | 88 | ND | ND | ND | 99 | 10 | 0.32 | ND | 19 | 39 | 32 | ND | 62 | ND | 19 | 120 | ND | ND | ND | ND | ND | | | | | | | | | |
| **TP187** | 0.1 | 540 | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 14 | ND | 88 | ND | ND | ND | 97 | 22 | 0.6 | ND | 12 | 52 | 22 | ND | 21 | 0.41 | 16 | 62 | ND | ND | 0.0074 | ND | ND | | | | | | | | | |
| | 0.7 | 760 | 14 | ND | ND | ND | ND | ND | ND | ND | 210 | ND | ND | ND | ND | ND | ND | 110 | 98 | 110 | 98 | ND | ND | ND | ND | ND | ND | 16 | ND | 76 | ND | ND | ND | 96 | 23 | 1.2 | ND | 14 | 59 | 28 | ND | 27 | 0.54 | 24 | 69 | ND | ND | 0.0066 | ND | ND | | | | | | | | | |
| **TP188** | 0.1 | 930 | 19 | ND | ND | ND | ND | ND | ND | ND | 67 | ND | ND | 6.9 | ND | 10 | ND | 49 | ND | 67 | ND | ND | ND | 0.02 | ND | ND | ND | 4.1 | ND | 72 | ND | ND | ND | 97 | 40 | 0.55 | ND | 17 | 40 | 41 | ND | 25 | 0.37 | 34 | 180 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 0.7 | 950 | 8.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.039 | ND | ND | ND | 9.2 | ND | 83 | ND | ND | ND | 98 | 11 | 0.57 | ND | 10 | 20 | 19 | ND | 30 | ND | 18 | 75 | ND | ND | 0.0072 | ND | ND | | | | | | | | | |
| **TP189** | 0.1 | 1200 | 14 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.14 | ND | ND | 18 | ND | 69 | ND | ND | ND | 100 | | | 1.6 | 15 | 130 | 45 | ND | 18 | ND | 22 | 170 | ND | ND | 0.026 | ND | ND | | | | | | | | | |
| **TP196** | 0.1 | 1400 | 12 | ND | ND | ND | ND | ND | ND | ND | 250 | ND | ND | 4.3 | 14 | 15 | 23 | 63 | 130 | 82 | 170 | ND | ND | ND | 0.14 | ND | ND | 28 | ND | 80 | ND | ND | ND | 98 | 110 | 0.48 | 1.3 | 22 | 560 | 1300 | 0.34 | 48 | 0.55 | 29 | 5600 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 0.7 | 1900 | 9.4 | ND | ND | ND | ND | ND | ND | ND | 250 | ND | ND | 7.6 | ND | 20 | 18 | 98 | 110 | 120 | 130 | ND | ND | ND | ND | ND | ND | 28 | ND | 73 | ND | ND | ND | 98 | 350 | 0.44 | 2.3 | 19 | 990 | 2500 | 2 | 39 | 0.48 | 29 | 7200 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 1.4 | 930 | 7.8 | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | 9.4 | ND | 41 | 56 | 51 | 56 | ND | ND | ND | ND | ND | ND | 27 | ND | 79 | ND | ND | ND | 96 | 66 | 0.32 | 1.2 | 14 | 400 | 930 | ND | 30 | ND | 19 | 3100 | ND | ND | ND | ND | ND | | | | | | | | | |
| | 2.1 | 930 | 5.6 | ND | ND | ND | ND | ND | ND | ND | 31 | ND | ND | ND | ND | ND | ND | 31 | ND | 31 | ND | ND | ND | ND | 0.11 | ND | ND | 30 | ND | 79 | ND | ND | ND | 95 | 62 | 0.3 | 1.1 | 15 | 380 | 870 | ND | 29 | ND | 17 | 3300 | ND | ND | ND | ND | ND | | | | | | | | | |

TABLE B: Area 1 Phase 2 Validation Analytical Data

| fk_location | Depth | MANGANESE | MOISTURE | N_BUTYLBENZENE | N_PROPYLBENZENE | NAPHTHALENE | O_XYLENE | P_ISOPROPYLTOLUENE | PHENANTHRENE | PYRENE | RISK_EPH_C5_C44 | RISK_TPH_C10_C12_ALI | RISK_TPH_C10_C12_AROM | RISK_TPH_C12_C16_ALI | RISK_TPH_C12_C16_AROM | RISK_TPH_C16_C21_ALI | RISK_TPH_C16_C21_AROM | RISK_TPH_C21_C40_ALI | RISK_TPH_C21_C40_AROM | RISK_TPH_C5_C44_ALI | RISK_TPH_C5_C44_ARO | RISK_TPH_C5_C7_ARO | RISK_TPH_C6_C8_ALI | RISK_TPH_C7_C8_AROM | RISK_TPH_C8_C10_ALI | RISK_TPH_C8_C10_AROM | SEC_BUTYLBENZENE | STONES | STYRENE | TERPHENYL_D14 | TERT_BUTYLBENZENE | TETRACHLOROETHENE | TOLUENE | TOLUENE_D8 | TOTAL_ARSENIC | TOTAL_BORON | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | TRANS_1_2_DICHLOROETHENE | TRANS_1_3_DICHLOROPROPENE | TRICHLOROETHENE | TRICHLOROFLUOROMETHANE | VINYL_CHLORIDE | TPH_C16_C21_6SPLIT | TPH_C8_C10_6SPLIT | TPH_C6_C8_6SPLIT | TPH_C21_C40_6SPLIT | TPH_C12_C16_6SPLIT | TPH_C10_C12_6SPLIT | TOTAL_TPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TP197 | 0.1 | 580 | 9.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 11 | ND | 84 | ND | ND | ND | 100 | 10 | 0.59 | ND | 19 | 32 | 34 | ND | 44 | 0.45 | 23 | 120 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 540 | 7.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 23 | ND | 77 | ND | ND | ND | 98 | 11 | 0.32 | ND | 17 | 32 | 32 | ND | 40 | 0.34 | 19 | 140 | ND | ND | ND | ND | ND | | | | | | | |
| TP198 | 0.1 | 810 | 9.9 | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | ND | 5.8 | ND | 37 | 53 | 43 | 53 | ND | ND | 0.021 | ND | ND | ND | 5.7 | ND | 80 | ND | ND | ND | 98 | 17 | 1.3 | ND | 19 | 78 | 110 | ND | 36 | 0.38 | 21 | 300 | ND | ND | 0.0071 | ND | ND | | | | | | | |
| | 0.7 | 730 | 15 | ND | ND | ND | ND | ND | ND | ND | 200 | ND | ND | ND | ND | ND | 6.8 | 52 | 140 | 52 | 150 | ND | ND | ND | ND | ND | ND | 4.6 | ND | 82 | ND | ND | ND | 98 | 10 | 0.67 | 0.52 | 14 | 90 | 31 | ND | 23 | 0.6 | 26 | 150 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | 590 | 9.8 | ND | ND | ND | ND | ND | ND | ND | 88 | ND | ND | ND | ND | 6 | ND | 34 | 48 | 40 | 48 | ND | ND | 0.064 | ND | ND | ND | 5.1 | ND | 80 | ND | ND | ND | 97 | 11 | 0.53 | 0.52 | 17 | 63 | 75 | ND | 38 | 0.33 | 22 | 230 | ND | ND | 0.0059 | ND | ND | | | | | | | |
| TP199 | 0.1 | 480 | 17 | ND | ND | ND | ND | ND | ND | ND | 530 | 250 | 6.6 | 140 | 27 | 19 | 30 | 27 | 16 | 450 | 78 | ND | 0.13 | 0.02 | 1.8 | ND | ND | 1.9 | ND | 80 | ND | ND | ND | 98 | 6.1 | 0.78 | 0.9 | 12 | 14 | 15 | ND | 8.2 | 0.54 | 23 | 66 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 700 | 14 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.014 | ND | ND | ND | 2.5 | ND | 56 | ND | ND | ND | 97 | 9.9 | 0.59 | ND | 16 | 54 | 21 | ND | 26 | 0.48 | 22 | 120 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | 680 | 14 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.022 | ND | ND | ND | 4.8 | ND | 83 | ND | ND | ND | 98 | 9.8 | 0.73 | ND | 16 | 42 | 29 | ND | 25 | 0.5 | 22 | 93 | ND | ND | ND | ND | ND | | | | | | | |
| TP200 | 0.1 | 980 | 14 | ND | ND | ND | ND | ND | ND | ND | 170 | 7.9 | ND | 60 | 13 | 41 | 34 | 7.2 | 7.7 | 120 | 53 | ND | ND | ND | 0.64 | ND | ND | 10 | ND | 69 | ND | ND | ND | 99 | 9.7 | 0.42 | ND | 21 | 24 | 21 | ND | 25 | ND | 29 | 91 | ND | ND | 0.037 | ND | ND | | | | | | | |
| | 0.7 | 720 | 10 | ND | ND | ND | ND | ND | ND | ND | 320 | 24 | ND | 110 | 41 | 64 | 54 | 9 | 8.8 | 210 | 100 | ND | ND | ND | 1.4 | ND | ND | 6.3 | ND | 81 | ND | ND | ND | 100 | 7.5 | 0.3 | ND | 18 | 19 | 16 | ND | 25 | ND | 25 | 71 | ND | ND | 0.037 | ND | ND | | | | | | | |
| | 1.4 | 650 | 13 | ND | ND | ND | ND | ND | ND | ND | 71 | 8 | ND | 25 | 9.7 | 15 | 13 | ND | ND | 49 | 23 | ND | ND | ND | 1.1 | ND | ND | 5 | ND | 82 | ND | ND | ND | 100 | 8.2 | 0.48 | ND | 14 | 21 | 16 | ND | 23 | ND | 23 | 72 | ND | ND | 0.02 | ND | ND | | | | | | | |
| TP201 | 0.1 | 650 | 13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 11 | ND | 84 | ND | ND | ND | 98 | 7.4 | 0.29 | ND | 11 | 17 | 14 | ND | 15 | 0.49 | 20 | 55 | ND | ND | 0.044 | ND | ND | | | | | | | |
| | 0.7 | 630 | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.7 | ND | 84 | ND | ND | ND | 98 | 4.6 | ND | ND | 12 | 9.7 | 11 | ND | 22 | 0.31 | 15 | 59 | ND | ND | 0.06 | ND | ND | | | | | | | |
| TP206 | 0.1 | 820 | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.15 | ND | ND | 11 | ND | 66 | ND | ND | ND | 100 | | | ND | 12 | 45 | 30 | ND | 19 | 0.59 | 18 | 88 | ND | ND | 0.025 | ND | ND | | | | | | | |
| | 0.7 | 1000 | 8.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 14 | ND | 87 | ND | ND | ND | 100 | | | ND | 15 | 22 | 20 | ND | 16 | 0.53 | 18 | 66 | ND | ND | 0.021 | ND | ND | | | | | | | |
| | 1.4 | 800 | 6.3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 9 | ND | 64 | ND | ND | ND | 100 | | | ND | 16 | 22 | 19 | ND | 37 | ND | 21 | 77 | ND | ND | 0.018 | ND | ND | | | | | | | |
| TP207 | 0.1 | 960 | 6.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 | ND | 69 | ND | ND | ND | 97 | | | ND | 17 | 23 | 17 | ND | 42 | 0.5 | 19 | 66 | ND | ND | 0.028 | ND | ND | | | | | | | |
| | 0.7 | 930 | 7.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 9.3 | ND | 90 | ND | ND | ND | 98 | | | ND | 18 | 28 | 25 | ND | 59 | 0.34 | 21 | 82 | ND | ND | 0.022 | ND | ND | | | | | | | |
| TP208 | 0.1 | 1100 | 12 | ND | ND | ND | ND | ND | 1.1 | 1.7 | 500 | ND | ND | 16 | 17 | 40 | 34 | 160 | 240 | 220 | 300 | ND | ND | ND | 0.19 | ND | ND | 22 | ND | 84 | ND | ND | ND | 97 | 46 | 0.75 | 0.95 | 30 | 230 | 710 | 2.1 | 38 | 0.35 | 29 | 1900 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 790 | 10 | ND | ND | ND | ND | ND | ND | ND | 400 | ND | ND | ND | 19 | 16 | 28 | 88 | 260 | 100 | 300 | ND | ND | ND | ND | ND | ND | 27 | ND | 83 | ND | ND | ND | 98 | 65 | 0.47 | 1.8 | 27 | 200 | 690 | 0.3 | 32 | 0.44 | 31 | 1500 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | 610 | 16 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 17 | ND | 83 | ND | ND | ND | 97 | 14 | 0.57 | ND | 13 | 82 | 54 | ND | 12 | 0.79 | 25 | 110 | ND | ND | ND | ND | ND | | | | | | | |
| | 2.1 | 790 | 12 | ND | ND | ND | ND | ND | ND | ND | 97 | ND | ND | ND | 4.4 | 5 | 5.9 | 31 | 51 | 35 | 63 | ND | ND | ND | ND | ND | ND | 24 | ND | 90 | ND | ND | ND | 98 | 39 | 0.35 | 0.93 | 30 | 160 | 360 | ND | 31 | 0.49 | 29 | 860 | ND | ND | ND | ND | ND | | | | | | | |
| TP209 | 0.1 | 760 | 13 | ND | ND | ND | ND | ND | ND | ND | 130 | ND | ND | ND | ND | 14 | ND | 62 | 56 | 76 | 56 | ND | ND | ND | ND | ND | ND | 23 | ND | 87 | ND | ND | ND | 100 | 35 | 0.43 | 0.67 | 17 | 80 | 140 | ND | 40 | 0.44 | 25 | 330 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 520 | 14 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 17 | ND | 85 | ND | ND | ND | 99 | 32 | 0.62 | ND | 16 | 89 | 75 | ND | 35 | 0.56 | 21 | 200 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | 730 | 14 | ND | ND | ND | ND | ND | ND | ND | 19 | 6.2 | ND | 12 | ND | ND | ND | ND | ND | 19 | ND | ND | ND | ND | 0.26 | ND | ND | 17 | ND | 81 | ND | ND | ND | 99 | 21 | 0.63 | ND | 16 | 75 | 50 | ND | 32 | 0.6 | 21 | 140 | ND | ND | ND | ND | ND | | | | | | | |
| | 2.1 | 560 | 18 | ND | ND | ND | ND | ND | ND | ND | 56 | 18 | ND | 38 | ND | ND | ND | ND | ND | 56 | ND | ND | ND | ND | 0.32 | ND | ND | 7.4 | ND | 71 | ND | ND | ND | 98 | 18 | 0.49 | ND | 19 | 36 | 30 | ND | 37 | ND | 23 | 110 | ND | ND | ND | ND | ND | | | | | | | |
| | 2.8 | 660 | 10 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18 | ND | 89 | ND | ND | ND | 98 | 13 | 0.67 | ND | 16 | 33 | 24 | ND | 42 | 0.39 | 20 | 100 | ND | ND | ND | ND | ND | | | | | | | |
| TP210 | 0.1 | 670 | 12 | ND | ND | ND | ND | ND | ND | ND | 110 | ND | ND | ND | ND | 10 | ND | 50 | 50 | 60 | 50 | ND | ND | ND | ND | ND | ND | 26 | ND | 91 | ND | ND | ND | 99 | 36 | 0.46 | 0.7 | 18 | 190 | 430 | ND | 29 | 0.42 | 23 | 890 | ND | ND | 0.0085 | ND | ND | | | | | | | |
| | 0.7 | 810 | 12 | ND | ND | ND | ND | ND | ND | ND | 160 | ND | ND | 24 | ND | 39 | 15 | 47 | 38 | 110 | 52 | ND | ND | ND | ND | ND | ND | 23 | ND | 87 | ND | ND | ND | 99 | 30 | 0.27 | 0.74 | 18 | 200 | 330 | ND | 32 | 0.46 | 24 | 950 | ND | ND | 0.0068 | ND | ND | | | | | | | |
| TP211 | 0.1 | 890 | 11 | ND | ND | ND | ND | ND | ND | ND | 130 | ND | ND | 9.1 | ND | 12 | ND | 56 | 57 | 78 | 57 | ND | ND | 0.062 | ND | ND | ND | 9.5 | ND | 68 | ND | ND | ND | 97 | 18 | 0.3 | 0.97 | 20 | 51 | 90 | ND | 41 | 0.39 | 27 | 220 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.4 | 710 | 18 | ND | ND | ND | ND | ND | ND | ND | 45 | ND | ND | 3.9 | ND | 21 | ND | 21 | ND | 45 | ND | ND | ND | 0.032 | ND | ND | ND | 5.3 | ND | 90 | ND | ND | ND | 96 | 38 | 0.43 | 0.56 | 16 | 100 | 39 | ND | 26 | 0.66 | 26 | 96 | ND | ND | 0.0091 | ND | ND | | | | | | | |
| | 0.7 | 670 | 17 | ND | ND | ND | ND | ND | ND | ND | 42 | ND | ND | ND | ND | 3.3 | ND | 39 | ND | 42 | ND | ND | ND | 0.029 | ND | ND | ND | 4.4 | ND | 71 | ND | ND | ND | 97 | 41 | 0.48 | 0.55 | 15 | 110 | 40 | ND | 26 | 0.57 | 22 | 85 | ND | ND | 0.0076 | ND | ND | | | | | | | |
| | 2.1 | 650 | 12 | ND | ND | ND | ND | ND | 1.5 | 1.1 | 2800 | 260 | 64 | 780 | 490 | 530 | 490 | 65 | 97 | 1700 | 1100 | ND | 8.8 | ND | 83 | 0.94 | 0.11 | 2.7 | ND | 78 | ND | ND | ND | 100 | 6.5 | 0.61 | ND | 15 | 17 | 23 | ND | 33 | 0.38 | 21 | 90 | ND | ND | ND | ND | ND | | | | | | | |
| | 2.8 | 590 | 14 | ND | ND | ND | ND | ND | ND | ND | 2000 | 170 | 28 | 530 | 300 | 400 | 370 | 56 | 79 | 1200 | 780 | ND | 1.9 | 0.026 | 26 | 0.23 | 0.028 | 7.5 | ND | 87 | ND | ND | ND | 100 | 11 | 0.54 | 0.56 | 15 | 24 | 24 | ND | 31 | 0.41 | 21 | 96 | ND | ND | ND | ND | ND | | | | | | | |
| TP212 | 0.1 | 1100 | 14 | ND | ND | ND | ND | ND | ND | ND | 110 | 9.7 | ND | 23 | ND | 7 | ND | 33 | 35 | 73 | 35 | ND | ND | ND | 0.4 | ND | ND | 13 | ND | 73 | ND | ND | ND | 97 | 23 | 0.67 | ND | 16 | 59 | 44 | ND | 20 | 0.33 | 24 | 130 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 1100 | 15 | ND | ND | ND | ND | ND | ND | ND | 49 | 12 | ND | 28 | ND | 8.4 | ND | ND | ND | 49 | ND | ND | ND | ND | 0.53 | ND | ND | 10 | ND | 76 | ND | ND | ND | 100 | 18 | 0.6 | ND | 16 | 57 | 59 | ND | 21 | 0.3 | 22 | 160 | ND | ND | 0.013 | ND | ND | | | | | | | |
| TP213 | 0.1 | 1400 | 21 | ND | ND | ND | ND | ND | ND | ND | 34 | ND | ND | ND | 5.7 | ND | 7.6 | ND | 22 | ND | 34 | ND | ND | ND | ND | ND | ND | 0.27 | ND | 69 | ND | ND | ND | 98 | 59 | 0.72 | 1.8 | 17 | 160 | 87 | ND | 28 | 0.54 | 27 | 260 | ND | ND | 0.058 | ND | ND | | | | | | | |
| | 0.7 | 1000 | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 7 | ND | 78 | ND | ND | ND | 97 | 8.2 | 0.3 | ND | 13 | 23 | 24 | ND | 27 | ND | 19 | 83 | ND | ND | 0.014 | ND | ND | | | | | | | |
| | 1.4 | 1300 | 13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 13 | ND | 76 | ND | ND | ND | 97 | 13 | 0.33 | ND | 14 | 35 | 32 | ND | 29 | ND | 20 | 100 | ND | ND | 0.036 | ND | ND | | | | | | | |
| | 2.1 | 1600 | 20 | ND | ND | ND | ND | ND | ND | ND | 860 | 80 | 13 | 280 | 140 | 140 | 140 | 29 | 36 | 530 | 330 | ND | 0.49 | ND | 9 | 0.14 | ND | 27 | ND | 72 | ND | ND | ND | 100 | 17 | 0.45 | 0.56 | 24 | 60 | 130 | ND | 30 | 0.39 | 22 | 110 | ND | ND | 0.016 | ND | ND | | | | | | | |
| TP214 | 0.1 | 790 | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 | ND | 88 | ND | ND | ND | 98 | 12 | 0.43 | ND | 14 | 39 | 32 | ND | 25 | 0.32 | 20 | 130 | ND | ND | 0.0066 | ND | ND | | | | | | | |
| | 0.7 | 910 | 8.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 20 | ND | 83 | ND | ND | ND | 98 | 15 | 0.35 | ND | 13 | 20 | 17 | ND | 25 | 0.33 | 19 | 78 | ND | ND | 0.02 | ND | ND | | | | | | | |
| | 1.4 | 770 | 6.3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 27 | ND | 87 | ND | ND | ND | 99 | 11 | 0.3 | ND | 14 | 21 | 20 | ND | 36 | ND | 18 | 100 | ND | ND | 0.017 | ND | ND | | | | | | | |
| TP215 | 0.1 | 1500 | 10 | ND | ND | ND | ND | ND | ND | ND | 21 | 3.7 | ND | 11 | ND | 6.4 | ND | ND | ND | 21 | ND | ND | ND | ND | 0.12 | ND | ND | 9.7 | ND | 72 | ND | ND | ND | 100 | | | ND | 15 | 38 | 41 | ND | 50 | 0.42 | 28 | 120 | ND | ND | 0.019 | ND | ND | | | | | | | |
| | 0.7 | 1400 | 7.3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.11 | ND | ND | 11 | ND | 82 | ND | ND | ND | 100 | | | ND | 12 | 14 | 25 | ND | 42 | ND | 22 | 120 | ND | ND | 0.014 | ND | ND | | | | | | | |
| TP216 | 0.1 | 1100 | 5.6 | ND | ND | ND | ND | ND | ND | ND | 24 | ND | ND | 7 | ND | 7.3 | ND | 10 | ND | 24 | ND | ND | ND | ND | 0.15 | ND | ND | 10 | ND | 62 | ND | ND | ND | 96 | 6.7 | 0.27 | ND | 22 | 32 | 180 | ND | 70 | ND | 27 | 160 | ND | ND | ND | ND | ND | | | | | | | |
| TP218 | 0.1 | 850 | 13 | ND | ND | ND | ND | ND | ND | 2.6 | 61 | ND | ND | ND | ND | ND | ND | 25 | 36 | 25 | 36 | ND | ND | ND | ND | ND | ND | 10 | ND | 45 | ND | ND | ND | 100 | | | 0.52 | 17 | 78 | 84 | ND | 33 | 0.45 | 24 | 170 | ND | ND | 0.0098 | ND | ND | | | | | | | |
| | 0.7 | 920 | 6.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18 | ND | 81 | ND | ND | ND | 99 | | | ND | 21 | 35 | 23 | ND | 51 | ND | 24 | 97 | ND | ND | 0.015 | ND | ND | | | | | | | |
| | 1.4 | 1200 | 6.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 14 | ND | 74 | ND | ND | ND | 100 | | | ND | 21 | 36 | 25 | ND | 67 | ND | 27 | 110 | ND | ND | 0.015 | ND | ND | | | | | | | |
| TP219 | 0.1 | 790 | 9.8 | ND | ND | ND | ND | ND | ND | ND | 160 | ND | ND | ND | 11 | ND | 29 | 22 | 98 | 22 | 130 | ND | ND | ND | ND | ND | ND | 14 | ND | 74 | ND | ND | ND | 100 | | | ND | 19 | 54 | 55 | ND | 37 | 0.37 | 22 | 130 | ND | ND | 0.019 | ND | ND | | | | | | | |
| | 0.7 | 1900 | 7.7 | ND | ND | ND | ND | ND | ND | ND | 23 | ND | ND | ND | ND | ND | 4.3 | ND | 18 | ND | 23 | ND | ND | ND | 0.12 | ND | ND | 6.4 | ND | 82 | ND | ND | ND | 100 | | | ND | 18 | 42 | 50 | ND | 69 | 0.44 | 34 | 110 | ND | ND | 0.027 | ND | ND | | | | | | | |
| TP220 | 0.1 | 720 | 11 | ND | ND | ND | ND | ND | ND | ND | 400 | 13 | ND | 45 | 21 | 45 | 33 | 120 | 120 | 220 | 180 | ND | ND | ND | ND | ND | ND | 15 | ND | 86 | ND | ND | ND | 98 | 18 | 0.55 | 0.55 | 16 | 52 | 64 | ND | 38 | 0.33 | 24 | 150 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 790 | 11 | ND | ND | ND | ND | ND | ND | ND | 520 | 17 | ND | 62 | 26 | 65 | 43 | 160 | 160 | 300 | 220 | ND | ND | ND | 0.17 | ND | ND | 21 | ND | 83 | ND | ND | ND | 98 | 18 | 0.53 | 0.55 | 16 | 45 | 320 | ND | 34 | 0.43 | 22 | 130 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | 720 | 17 | ND | ND | ND | ND | ND | ND | ND | 300 | 10 | ND | 36 | 19 | 35 | 25 | 90 | 89 | 170 | 130 | ND | ND | ND | 0.48 | ND | ND | 28 | ND | 47 | ND | ND | ND | 97 | 40 | 0.98 | ND | 14 | 85 | 55 | ND | 23 | 0.61 | 24 | 110 | ND | ND | ND | ND | ND | | | | | | | |
| | 2.1 | 580 | 14 | ND | ND | ND | ND | ND | ND | ND | 240 | 7.2 | ND | 31 | 13 | 35 | 19 | 72 | 64 | 150 | 95 | ND | ND | ND | 0.13 | ND | ND | 27 | ND | 87 | ND | ND | ND | 98 | 32 | 0.53 | ND | 14 | 70 | 68 | ND | 26 | 0.58 | 23 | 190 | ND | ND | 0.0062 | ND | ND | | | | | | | |
| TP221 | 0.1 | 760 | 14 | ND | ND | ND | ND | ND | ND | ND | 470 | ND | ND | 4.1 | ND | 30 | 9.3 | 160 | 260 | 200 | 270 | ND | ND | ND | ND | ND | ND | 19 | ND | 88 | ND | ND | ND | 100 | 35 | 0.37 | 0.85 | 16 | 100 | 230 | ND | 28 | 0.51 | 27 | 780 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 620 | 5.4 | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | 4.1 | ND | 12 | ND | 42 | 37 | 58 | 37 | ND | ND | 0.012 | 0.12 | ND | ND | 30 | ND | 84 | ND | ND | ND | 99 | 12 | ND | ND | 17 | 29 | 31 | ND | 44 | ND | 20 | 92 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | 650 | 17 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 15 | ND | 83 | ND | ND | ND | 100 | 50 | 0.97 | ND | 14 | 73 | 50 | ND | 15 | 0.79 | 25 | 51 | ND | ND | ND | ND | ND | | | | | | | |
| | 2.1 | 700 | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 19 | ND | 88 | ND | ND | ND | 100 | 20 | 0.46 | ND | 15 | 41 | 28 | ND | 31 | 0.44 | 21 | 92 | ND | ND | ND | ND | ND | | | | | | | |
| TP222 | 0.1 | 740 | 11 | ND | ND | ND | ND | ND | ND | ND | 740 | ND | ND | ND | ND | 40 | 15 | 360 | 330 | 400 | 340 | ND | ND | 0.044 | ND | ND | ND | 8.6 | ND | 75 | ND | ND | ND | 95 | 25 | 0.5 | 0.91 | 16 | 58 | 64 | ND | 33 | 0.42 | 23 | 180 | ND | ND | 0.0088 | ND | ND | | | | | | | |
| | 0.7 | 710 | 9.6 | ND | ND | ND | ND | ND | ND | ND | 480 | ND | ND | 3.1 | ND | 13 | 7.9 | 220 | 230 | 230 | 240 | ND | ND | 0.029 | ND | ND | ND | 11 | ND | 77 | ND | ND | ND | 97 | 21 | 0.41 | 0.68 | 24 | 56 | 200 | ND | 48 | ND | 22 | 330 | ND | ND | ND | ND | ND | | | | | | | |
| TP225 | 0.1 | 790 | 11 | ND | ND | ND | ND | ND | 1.3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 23 | ND | 79 | ND | ND | ND | 97 | 8.9 | 0.52 | ND | 15 | 24 | 16 | ND | 32 | ND | 20 | 110 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 790 | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 0.018 | ND | ND | ND | 18 | ND | 76 | ND | ND | ND | 97 | 30 | 0.41 | 0.57 | 16 | 66 | 180 | ND | 29 | 0.34 | 23 | 320 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | 860 | 9.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18 | ND | 42 | ND | ND | ND | 98 | 18 | 0.35 | 0.6 | 15 | 49 | 78 | ND | 36 | ND | 19 | 170 | ND | ND | ND | ND | ND | | | | | | | |
| TP226 | 0.1 | 1000 | 14 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 17 | ND | 78 | ND | ND | ND | 97 | 50 | 1.4 | ND | 15 | 64 | 21 | ND | 18 | 0.77 | 26 | 72 | ND | ND | 0.0066 | ND | ND | | | | | | | |
| | 0.7 | 960 | 13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 16 | ND | 85 | ND | ND | ND | 97 | 21 | 1.2 | ND | 13 | 70 | 15 | ND | 22 | 0.49 | 23 | 67 | ND | ND | 0.014 | ND | ND | | | | | | | |
| | 1.4 | 600 | 7.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 21 | ND | 80 | ND | ND | ND | 98 | 9.7 | 0.91 | ND | 12 | 47 | 14 | ND | 25 | ND | 16 | 72 | ND | ND | 0.01 | ND | ND | | | | | | | |
| | 2.1 | 860 | 7.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18 | ND | 72 | ND | ND | ND | 97 | 6.6 | 0.35 | ND | 15 | 41 | ND | ND | 42 | ND | 19 | 110 | ND | ND | 0.0079 | ND | ND | | | | | | | |
| TP227 | 0.1 | 960 | 7.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 14 | ND | 54 | ND | ND | ND | 97 | 6.2 | 0.32 | ND | 17 | 22 | 17 | ND | 41 | 0.3 | 22 | 100 | ND | ND | 0.008 | ND | ND | | | | | | | |
| | 0.7 | 1100 | 7.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 10 | ND | 78 | ND | ND | ND | 97 | 5.9 | 0.3 | ND | 18 | 23 | 15 | ND | 50 | ND | 27 | 94 | ND | ND | 0.007 | ND | ND | | | | | | | |

TABLE B: Area 1 Phase 2 Validation Analytical Data

| fk_location | Depth | MANGANESE | MOISTURE | N_BUTYLBENZENE | N_PROPYLBENZENE | NAPHTHALENE | O_XYLENE | P_ISOPROPYLTOLUENE | PHENANTHRENE | PYRENE | RISK_EPH_C5_C44 | RISK_TPH_C10_C12_ALI | RISK_TPH_C10_C12_AROM | RISK_TPH_C12_C16_ALI | RISK_TPH_C12_C16_AROM | RISK_TPH_C16_C21_ALI | RISK_TPH_C16_C21_AROM |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.4 | 840 | 6.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 810 | 6.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP229 | 0.1 | 1200 | 15 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 530 | 9.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 850 | 8.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 400 | 6.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.8 | 840 | 5.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP230 | 0.1 | 480 | 8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP231 | 0.1 | 770 | 8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 830 | 20 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP232 | 0.1 | 1200 | 13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 920 | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 890 | 8.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP233 | 0.1 | 930 | 5.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 980 | 15 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 1300 | 7.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 940 | 6.3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP234 | 0.1 | 1000 | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 1000 | 10 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 1500 | 8.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP235 | 0.1 | 500 | 6.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 660 | 6.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 670 | 9.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 830 | 9.6 | ND | ND | ND | ND | ND | ND | ND | 28 | ND | ND | ND | ND | 2.4 | ND |
| TP236 | 0.1 | 860 | 13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 400 | 8.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 510 | 8.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP237 | 0.1 | 410 | 9 | ND | ND | ND | ND | ND | ND | ND | 56 | ND | ND | ND | 6.6 | ND | 10 |
| TP238 | 0.1 | 810 | 12 | ND | ND | ND | ND | ND | ND | ND | 49 | 5.1 | ND | 10 | ND | 13 | ND |
| | 0.7 | 830 | 8.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 1200 | 8.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP239 | 0.1 | 940 | 9 | ND | ND | ND | ND | ND | ND | ND | 22 | ND | ND | ND | ND | ND | ND |
| TP240 | 0.1 | 930 | 9.3 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 990 | 9.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 920 | 9.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP241 | 0.1 | 1200 | 13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 810 | 6.5 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 630 | 7.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP242 | 0.1 | 710 | 15 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 870 | 16 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 790 | 9.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP244 | 0.1 | 1100 | 8.4 | ND | ND | ND | ND | ND | ND | ND | 51 | ND | ND | ND | ND | ND | 7.8 |
| TP245 | 0.1 | 930 | 9.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 670 | 10 | ND | ND | ND | ND | ND | ND | ND | 40 | 12 | ND | 27 | ND | ND | ND |
| | 1.4 | 1500 | 11 | ND | ND | ND | ND | ND | ND | ND | 67 | 22 | ND | 45 | ND | ND | ND |
| | 2.1 | 1100 | 12 | ND | ND | ND | ND | ND | ND | ND | 25 | 8 | ND | 17 | ND | ND | ND |
| TP246 | 0.1 | 950 | 13 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 900 | 12 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 1.4 | 850 | 7.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 2.1 | 520 | 18 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP247 | 0.1 | 570 | 6.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| | 0.7 | 690 | 4.9 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP248 | 0.1 | 1300 | 9.2 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP249 | 0.1 | 810 | 11 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP250 | 0.1 | 750 | 11 | ND | ND | ND | ND | ND | ND | 1.3 | 150 | ND | ND | ND | 6.2 | ND | 11 |
| TP251 | 0.1 | 910 | 7.6 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND |
| TP36 | 0.1 | 810 | 7.3 | ND | ND | ND | ND | ND | ND | ND | 250 | 4.3 | ND | 17 | 17 | 23 | 24 |
| TP53 | 0.1 | 600 | 14 | ND | ND | ND | ND | ND | 1.9 | 3.3 | 240 | ND | ND | ND | ND | ND | ND |
| TP99 | 0.1 | 590 | 7.9 | ND | ND | ND | ND | ND | ND | ND | 40 | ND | ND | ND | ND | ND | ND |
| TP184 | 0.1 | 1100 | 11 | ND | ND | ND | ND | ND | ND | ND | 96 | ND | ND | 17 | 3 | 33 | 21 |
| | 0.7 | 610 | 9.5 | ND | ND | ND | ND | ND | ND | ND | 780 | 250 | 11 | 360 | 82 | 30 | 21 |
| | 1.4 | 670 | 7.4 | ND | ND | ND | ND | ND | ND | ND | 32 | 4.1 | ND | 17 | ND | 11 | ND |
| | 2.1 | 590 | 8.7 | ND | ND | ND | ND | ND | ND | ND | 210 | 12 | ND | 72 | 21 | 47 | 41 |
| | 0.7 | | | | | | | | | | | | | | | | |
| TP171 | 0.1 | 860 | 8.1 | ND | ND | ND | ND | ND | ND | 2.7 | | | | | | | |
| TP172 | 0.1 | 940 | 11 | ND | ND | ND | ND | ND | ND | ND | | | | | | | |
| TP228 | 0.1 | 1000 | 11 | ND | ND | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 680 | 8.4 | ND | ND | ND | ND | ND | ND | ND | | | | | | | |
| TP243 | 0.1 | 1200 | 7 | ND | ND | ND | ND | ND | ND | ND | | | | | | | |

| fk_location | Depth | RISK_TPH_C21_C40_ALI | RISK_TPH_C21_C40_AROM | RISK_TPH_C5_C44_ALI | RISK_TPH_C5_C44_ARO | RISK_TPH_C5_C7_ARO | RISK_TPH_C6_C8_ALI | RISK_TPH_C7_C8_AROM | RISK_TPH_C8_C10_ALI | RISK_TPH_C8_C10_AROM | SEC_BUTYLBENZENE | STONES | STYRENE | TERPHENYL_D14 | TERT_BUTYLBENZENE | TETRACHLOROETHENE | TOLUENE | TOLUENE_D8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 16 | ND | 82 | ND | ND | ND | 97 |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 | ND | 80 | ND | ND | ND | 96 |
| TP229 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 8 | ND | 67 | ND | ND | ND | 99 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.4 | ND | 73 | ND | ND | ND | 100 |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6 | ND | 47 | ND | ND | ND | 99 |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.5 | ND | 83 | ND | ND | ND | 98 |
| | 2.8 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.9 | ND | 78 | ND | ND | ND | 100 |
| TP230 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3 | ND | 60 | ND | ND | ND | 98 |
| TP231 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 21 | ND | 82 | ND | ND | ND | 98 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 30 | ND | 79 | ND | ND | ND | 97 |
| TP232 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 14 | ND | 76 | ND | ND | ND | 97 |
| | 0.7 | ND | ND | ND | ND | ND | ND | 0.028 | 0.12 | ND | ND | 18 | ND | 86 | ND | ND | ND | 97 |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | 0.13 | ND | ND | 26 | ND | 88 | ND | ND | ND | 98 |
| TP233 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 8.6 | ND | 110 | ND | ND | ND | 97 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 23 | ND | 81 | ND | ND | ND | 97 |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 16 | ND | 76 | ND | ND | ND | 96 |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 25 | ND | 86 | ND | ND | ND | 95 |
| TP234 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4.3 | ND | 71 | ND | ND | ND | 95 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.1 | ND | 70 | ND | ND | ND | 96 |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3.6 | ND | 54 | ND | ND | ND | 95 |
| TP235 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.4 | ND | 44 | ND | ND | ND | 96 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 16 | ND | 87 | ND | ND | ND | 97 |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 25 | ND | 73 | ND | ND | ND | 97 |
| | 2.1 | 25 | ND | 28 | ND | ND | ND | ND | ND | ND | ND | 41 | ND | 54 | ND | ND | ND | 96 |
| TP236 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 7.2 | ND | 81 | ND | ND | ND | 96 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3.8 | ND | 70 | ND | ND | ND | 99 |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 4 | ND | 89 | ND | ND | ND | 99 |
| TP237 | 0.1 | ND | 38 | ND | 56 | ND | ND | ND | ND | ND | ND | 11 | ND | 60 | ND | ND | ND | 100 |
| TP238 | 0.1 | 22 | ND | 49 | ND | ND | ND | ND | ND | ND | ND | 10 | ND | 75 | ND | ND | ND | 100 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 11 | ND | 63 | ND | ND | ND | 100 |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5 | ND | 74 | ND | ND | ND | 99 |
| TP239 | 0.1 | 22 | ND | 22 | ND | ND | ND | ND | ND | ND | ND | 16 | ND | 76 | ND | ND | ND | 98 |
| TP240 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 14 | ND | 81 | ND | ND | ND | 97 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 13 | ND | 79 | ND | ND | ND | 97 |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18 | ND | 78 | ND | ND | ND | 98 |
| TP241 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 13 | ND | 84 | ND | ND | ND | 98 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 12 | ND | 86 | ND | ND | ND | 97 |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 13 | ND | 51 | ND | ND | ND | 97 |
| TP242 | 0.1 | ND | ND | ND | ND | ND | ND | 0.031 | 0.12 | ND | ND | 2.8 | ND | 82 | ND | ND | ND | 98 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 2.5 | ND | 59 | ND | ND | ND | 96 |
| | 1.4 | ND | ND | ND | ND | ND | ND | 0.016 | ND | ND | ND | 3.9 | ND | 37 | ND | ND | ND | 98 |
| TP244 | 0.1 | ND | 44 | ND | 51 | ND | ND | ND | ND | ND | ND | 21 | ND | 35 | ND | ND | ND | 98 |
| TP245 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 18 | ND | 85 | ND | ND | ND | 100 |
| | 0.7 | ND | ND | 40 | ND | ND | ND | ND | 0.64 | ND | ND | 16 | ND | 82 | ND | ND | ND | 98 |
| | 1.4 | ND | ND | 67 | ND | ND | ND | ND | 0.57 | ND | ND | 14 | ND | 86 | ND | ND | ND | 97 |
| | 2.1 | ND | ND | 25 | ND | 0.015 | ND | 0.076 | ND | ND | ND | 8.7 | ND | 75 | ND | ND | ND | 96 |
| TP246 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.8 | ND | 69 | ND | ND | ND | 100 |
| | 0.7 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 9.1 | ND | 75 | ND | ND | ND | 99 |
| | 1.4 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 5.7 | ND | 56 | ND | ND | ND | 99 |
| | 2.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 6.8 | ND | 67 | ND | ND | ND | 100 |
| TP247 | 0.1 | ND | ND | ND | ND | ND | ND | 0.017 | ND | ND | ND | 4.1 | ND | 88 | ND | ND | ND | 97 |
| | 0.7 | ND | ND | ND | ND | ND | ND | 0.014 | ND | ND | ND | 15 | ND | 42 | ND | ND | ND | 97 |
| TP248 | 0.1 | ND | ND | ND | ND | ND | ND | 0.02 | ND | ND | ND | 5.8 | ND | 89 | ND | ND | ND | 99 |
| TP249 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 3.8 | ND | 85 | ND | ND | ND | 96 |
| TP250 | 0.1 | 26 | 110 | 26 | 120 | ND | ND | ND | ND | ND | ND | 9.8 | ND | 61 | ND | ND | ND | 99 |
| TP251 | 0.1 | ND | ND | ND | ND | ND | ND | ND | ND | ND | ND | 9 | ND | 60 | ND | ND | ND | 99 |
| TP36 | 0.1 | 36 | 130 | 81 | 170 | ND | 0.15 | ND | 0.15 | ND | ND | 8.9 | ND | 90 | ND | ND | ND | 99 |
| TP53 | 0.1 | 60 | 190 | 60 | 190 | ND | ND | ND | ND | ND | ND | 34 | ND | 87 | ND | ND | ND | 97 |
| TP99 | 0.1 | 17 | 23 | 17 | 23 | ND | ND | ND | ND | ND | ND | 3.1 | ND | 68 | ND | ND | ND | 100 |
| TP184 | 0.1 | 11 | 11 | 61 | 35 | ND | ND | ND | ND | ND | ND | 21 | ND | 85 | ND | ND | ND | 97 |
| | 0.7 | 11 | 11 | 660 | 120 | ND | ND | ND | 4 | ND | ND | 9.1 | ND | 89 | ND | ND | ND | 99 |
| | 1.4 | ND | ND | 32 | ND | ND | ND | 0.021 | 0.17 | ND | ND | 18 | ND | 81 | ND | ND | ND | 98 |
| | 2.1 | 9 | 9.6 | 140 | 71 | ND | ND | ND | 0.38 | ND | ND | 21 | ND | 81 | ND | ND | ND | 97 |
| | 0.7 | | | | | | | | | | | | | | | | | |
| TP171 | 0.1 | | | | | | | | | | ND | 30 | ND | 59 | ND | ND | ND | 98 |
| TP172 | 0.1 | | | | | | | | | | ND | 14 | ND | 55 | ND | ND | ND | 95 |
| TP228 | 0.1 | | | | | | | | | | ND | 15 | ND | 85 | ND | ND | ND | 99 |
| | 0.7 | | | | | | | | | | ND | 32 | ND | 73 | ND | ND | ND | 95 |
| TP243 | 0.1 | | | | | | | | | | ND | 28 | ND | 17 | ND | ND | ND | 96 |

| fk_location | Depth | TOTAL_ARSENIC | TOTAL_BORON | TOTAL_CADMIUM | TOTAL_CHROMIUM | TOTAL_COPPER | TOTAL_LEAD | TOTAL_MERCURY | TOTAL_NICKEL | TOTAL_SELENIUM | TOTAL_VANADIUM | TOTAL_ZINC | TRANS_1_2_DICHLOROETHENE | TRANS_1_3_DICHLOROPROPENE | TRICHLOROETHENE | TRICHLOROFLUOROMETHANE | VINYL_CHLORIDE | TPH_C16_C21_6SPLIT | TPH_C8_C10_6SPLIT | TPH_C6_C8_6SPLIT | TPH_C21_C40_6SPLIT | TPH_C12_C16_6SPLIT | TPH_C10_C12_6SPLIT | TOTAL_TPH |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.4 | 5.5 | ND | ND | 17 | 23 | 16 | ND | 53 | ND | 21 | 86 | ND | ND | 0.0097 | ND | ND | | | | | | | |
| | 2.1 | 4.7 | 0.3 | ND | 16 | 18 | 12 | ND | 44 | ND | 19 | 83 | ND | ND | 0.0093 | ND | ND | | | | | | | |
| TP229 | 0.1 | | | ND | 14 | 19 | 20 | ND | 17 | 0.35 | 23 | 60 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | | | ND | 18 | 23 | 17 | ND | 46 | 0.38 | 19 | 83 | ND | ND | 0.02 | ND | ND | | | | | | | |
| | 1.4 | | | ND | 19 | 31 | 22 | ND | 63 | ND | 21 | 94 | ND | ND | 0.031 | ND | ND | | | | | | | |
| | 2.1 | | | ND | 13 | 8.3 | 13 | ND | 32 | ND | 13 | 61 | ND | ND | 0.018 | ND | ND | | | | | | | |
| | 2.8 | | | ND | 13 | 12 | 17 | ND | 41 | ND | 19 | 69 | ND | ND | 0.03 | ND | ND | | | | | | | |
| TP230 | 0.1 | 5.9 | 0.65 | ND | 20 | 30 | 21 | ND | 57 | ND | 22 | 94 | ND | ND | ND | ND | ND | | | | | | | |
| TP231 | 0.1 | 9.3 | ND | ND | 11 | 18 | 13 | ND | 25 | ND | 16 | 70 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 5.1 | ND | ND | 53 | 11 | 15 | ND | 69 | ND | 27 | 83 | ND | ND | ND | ND | ND | | | | | | | |
| TP232 | 0.1 | 33 | 0.54 | 0.76 | 15 | 100 | 38 | ND | 25 | 0.4 | 21 | 130 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 16 | 0.46 | 0.71 | 16 | 55 | 37 | ND | 42 | 0.35 | 22 | 130 | ND | ND | 0.0074 | ND | ND | | | | | | | |
| | 1.4 | 11 | 0.44 | 0.52 | 18 | 37 | 21 | ND | 48 | ND | 25 | 130 | ND | ND | ND | ND | ND | | | | | | | |
| TP233 | 0.1 | 43 | 0.9 | 0.53 | 18 | 83 | 44 | ND | 33 | 0.8 | 24 | 140 | ND | ND | 0.0094 | ND | ND | | | | | | | |
| | 0.7 | 23 | 0.58 | 0.52 | 24 | 73 | 32 | ND | 47 | 0.37 | 28 | 120 | ND | ND | 0.0061 | ND | ND | | | | | | | |
| | 1.4 | 9.7 | 0.54 | ND | 18 | 36 | 22 | ND | 59 | 0.3 | 28 | 110 | ND | ND | ND | ND | ND | | | | | | | |
| | 2.1 | 7.9 | 0.33 | ND | 19 | 27 | 14 | ND | 58 | ND | 26 | 90 | ND | ND | 0.0097 | ND | ND | | | | | | | |
| TP234 | 0.1 | 9.2 | 0.53 | ND | 20 | 29 | 22 | ND | 36 | 0.57 | 26 | 94 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 9.9 | 0.53 | ND | 19 | 33 | 25 | ND | 38 | 0.44 | 24 | 100 | ND | ND | 0.0056 | ND | ND | | | | | | | |
| | 1.4 | 8.9 | 0.38 | ND | 18 | 28 | 24 | ND | 42 | 0.39 | 29 | 92 | ND | ND | ND | ND | ND | | | | | | | |
| TP235 | 0.1 | 6.2 | ND | ND | 13 | 13 | 18 | ND | 29 | ND | 16 | 81 | ND | ND | 0.0063 | ND | ND | | | | | | | |
| | 0.7 | 7.2 | 0.42 | 0.56 | 15 | 17 | 19 | ND | 33 | ND | 18 | 370 | ND | ND | 0.0065 | ND | ND | | | | | | | |
| | 1.4 | 8.3 | 0.31 | 0.67 | 14 | 19 | 24 | ND | 26 | 0.34 | 17 | 580 | ND | ND | ND | ND | ND | | | | | | | |
| | 2.1 | 10 | 0.4 | 1.8 | 17 | 32 | 35 | ND | 42 | 0.31 | 22 | 1100 | ND | ND | 0.0093 | ND | ND | | | | | | | |
| TP236 | 0.1 | | | ND | 16 | 27 | 21 | ND | 38 | 0.46 | 22 | 140 | ND | ND | 0.022 | ND | ND | | | | | | | |
| | 0.7 | | | ND | 13 | 6.3 | 14 | ND | 28 | ND | 14 | 66 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | | | ND | 13 | 7.9 | 12 | ND | 31 | ND | 13 | 60 | ND | ND | ND | ND | ND | | | | | | | |
| TP237 | 0.1 | | | ND | 13 | 38 | 61 | ND | 26 | ND | 15 | 120 | ND | ND | 0.01 | ND | ND | | | | | | | |
| TP238 | 0.1 | | | ND | 14 | 20 | 22 | ND | 27 | 0.86 | 21 | 89 | ND | ND | 0.016 | ND | ND | | | | | | | |
| | 0.7 | | | ND | 11 | 17 | 15 | ND | 25 | 0.43 | 18 | 72 | ND | ND | 0.014 | ND | ND | | | | | | | |
| | 1.4 | | | ND | 11 | 14 | 16 | ND | 31 | ND | 21 | 75 | ND | ND | 0.019 | ND | ND | | | | | | | |
| TP239 | 0.1 | | | ND | 14 | 29 | 37 | ND | 39 | ND | 16 | 120 | ND | ND | ND | ND | ND | | | | | | | |
| TP240 | 0.1 | 7.9 | 0.53 | ND | 18 | 31 | 14 | ND | 40 | ND | 22 | 98 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 8.3 | 0.34 | ND | 18 | 27 | 14 | ND | 41 | ND | 21 | 100 | ND | ND | 0.0091 | ND | ND | | | | | | | |
| | 1.4 | 6.6 | 0.45 | ND | 18 | 31 | 25 | ND | 47 | ND | 21 | 160 | ND | ND | 0.019 | ND | ND | | | | | | | |
| TP241 | 0.1 | 18 | 0.54 | ND | 17 | 50 | 27 | ND | 27 | 0.55 | 27 | 98 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 6 | 0.31 | ND | 15 | 14 | ND | ND | 40 | ND | 19 | 79 | ND | ND | 0.014 | ND | ND | | | | | | | |
| | 1.4 | 6.1 | 0.32 | ND | 14 | 12 | ND | ND | 45 | ND | 17 | 70 | ND | ND | 0.0092 | ND | ND | | | | | | | |
| TP242 | 0.1 | 10 | 0.67 | ND | 12 | 35 | 21 | ND | 13 | 0.89 | 23 | 56 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 19 | 0.52 | ND | 15 | 61 | 38 | ND | 25 | 0.62 | 21 | 95 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | 10 | 0.45 | ND | 14 | 28 | 20 | ND | 30 | 0.47 | 19 | 83 | ND | ND | ND | ND | ND | | | | | | | |
| TP244 | 0.1 | | | ND | 35 | 55 | 77 | ND | 45 | 0.38 | 28 | 150 | ND | ND | 0.022 | ND | ND | | | | | | | |
| TP245 | 0.1 | 6.5 | ND | ND | 15 | 22 | 12 | ND | 43 | ND | 21 | 130 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 6.4 | 0.3 | ND | 15 | 18 | 31 | ND | 41 | ND | 20 | 110 | ND | ND | ND | ND | ND | | | | | | | |
| | 1.4 | 5.2 | 0.38 | ND | 13 | 12 | 12 | ND | 41 | ND | 15 | 83 | ND | ND | ND | ND | ND | | | | | | | |
| | 2.1 | 12 | ND | ND | 12 | 16 | ND | ND | 40 | ND | 15 | 86 | ND | ND | ND | ND | ND | | | | | | | |
| TP246 | 0.1 | | | ND | 13 | 72 | 37 | ND | 18 | 0.58 | 22 | 86 | ND | ND | 0.017 | ND | ND | | | | | | | |
| | 0.7 | | | ND | 12 | 95 | 35 | ND | 18 | 0.75 | 20 | 68 | ND | ND | 0.014 | ND | ND | | | | | | | |
| | 1.4 | | | ND | 13 | 32 | 17 | ND | 27 | 0.42 | 20 | 80 | ND | ND | 0.028 | ND | ND | | | | | | | |
| | 2.1 | | | ND | 11 | 15 | 12 | ND | 29 | ND | 14 | 70 | ND | ND | 0.04 | ND | ND | | | | | | | |
| TP247 | 0.1 | 5.7 | 0.34 | ND | 14 | 14 | 19 | ND | 37 | ND | 16 | 76 | ND | ND | ND | ND | ND | | | | | | | |
| | 0.7 | 6.7 | 0.32 | ND | 14 | 15 | 20 | ND | 38 | ND | 19 | 75 | ND | ND | ND | ND | ND | | | | | | | |
| TP248 | 0.1 | 9.2 | 0.45 | ND | 14 | 20 | 25 | ND | 43 | ND | 20 | 85 | ND | ND | ND | ND | ND | | | | | | | |
| TP249 | 0.1 | | | ND | 13 | 12 | 18 | ND | 36 | ND | 16 | 72 | ND | ND | 0.018 | ND | ND | | | | | | | |
| TP250 | 0.1 | | | ND | 15 | 32 | 56 | ND | 26 | 0.54 | 21 | 150 | ND | ND | 0.019 | ND | ND | | | | | | | |
| TP251 | 0.1 | | | ND | 17 | 28 | 23 | ND | 50 | ND | 23 | 97 | ND | ND | 0.023 | ND | ND | | | | | | | |
| TP36 | 0.1 | 11 | 0.33 | ND | 17 | 37 | 32 | ND | 36 | ND | 21 | 100 | ND | ND | 0.065 | ND | ND | | | | | | | |
| TP53 | 0.1 | 13 | 0.98 | 0.87 | 17 | 51 | 320 | ND | 24 | ND | 17 | 520 | ND | ND | 0.0065 | ND | ND | | | | | | | |
| TP99 | 0.1 | 33 | 0.6 | 0.54 | 17 | 42 | 170 | 0.33 | 33 | ND | 20 | 250 | ND | ND | 0.013 | ND | ND | | | | | | | |
| TP184 | 0.1 | 25 | 0.42 | 0.56 | 17 | 340 | 97 | ND | 56 | 0.37 | 26 | 440 | ND | ND | 0.013 | ND | ND | | | | | | | |
| | 0.7 | 8.3 | 0.61 | ND | 19 | 89 | 43 | ND | 42 | 0.33 | 22 | 140 | ND | ND | 0.025 | ND | ND | | | | | | | |
| | 1.4 | 15 | 0.41 | ND | 9 | 93 | 76 | ND | 51 | 0.34 | 20 | 210 | ND | ND | 0.01 | ND | ND | | | | | | | |
| | 2.1 | 15 | 0.35 | ND | 17 | 310 | 49 | ND | 48 | 0.31 | 23 | 170 | ND | ND | 0.0099 | ND | ND | | | | | | | |
| | 0.7 | | | | | | | | | | | | | | | | | | | | | | | |
| TP171 | 0.1 | 9.9 | | ND | 44 | 47 | 41 | ND | 27 | 0.33 | 40 | 150 | ND | ND | ND | ND | ND | 140 | 2.3 | ND | ## | 42 | 3.3 | ## |
| TP172 | 0.1 | 3.7 | | ND | 21 | 36 | 34 | ND | 50 | ND | 24 | 130 | ND | ND | ND | ND | ND | 30 | 1.7 | ND | 73 | 5 | 1.2 | ## |
| TP228 | 0.1 | 5.3 | | ND | 16 | 21 | 23 | ND | 34 | ND | 18 | 87 | ND | ND | ND | ND | ND | 9.7 | 1.7 | ND | ## | 4 | ND | ## |
| | 0.7 | 4.1 | | ND | 17 | 11 | 15 | ND | 31 | ND | 16 | 66 | ND | ND | ND | ND | ND | ND | 1.6 | ND | 62 | 2 | ND | 67 |
| TP243 | 0.1 | 6.4 | | ND | 17 | 11 | 19 | ND | 47 | ND | 28 | 76 | ND | ND | ND | ND | ND | ND | 1.6 | ND | 40 | 2 | ND | 43 |

"Emma Jones"
<e.k.jones@neath-porttalbot.gov.uk>
12/03/2009 10:47

To <Steve_Coates@URSCorp.com>
cc <Simon_Cole@URSCorp.com>
bcc
Subject RE: BP Llandarcy Area 1 - Validation Exceedences

History: This message has been replied to and forwarded.

Steve,

Thank you for the information provided and your request for acceptance of marginal chemical exceedances in soils at BP Llandarcy. The suggested approach to these exceedences is derived using the same principle as the Phase 1 validation that has previously been accepted by NPT, and following a telephone conversation with Simon yesterday to clarify a few issues, I would again agree with your justification.

Regards

Emma

Emma Jones
Contaminated Land Officer
01792 512687

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**From:** Steve_Coates@URSCorp.com [mailto:Steve_Coates@URSCorp.com]
**Sent:** 04 March 2009 18:23
**To:** Emma Jones
**Cc:** Simon_Cole@URSCorp.com
**Subject:** BP Llandarcy Area 1 - Validation Exceedences

Hi Emma

Please find attached a letter drafted by Simon Cole confirming the latest validation test results for the Area 1 remediation works and requesting acceptance for some of the results where marginal exceedences have been detected. We are keen to minimise the amount of material unnecessarily removed as waste from the site and we consider there is a strong case for the samples highlighted within Simon's letter to be accepted at the levels recorded.

As always, there is pressure on us from BP and the project team to reach an agreement on this as soon as possible in order that the remediation works can be concluded so I would appreciate your earliest response on this. It would be helpful if you could advise a time-frame in the first instance within which you would anticipate being able to respond.

We would be happy to meet with you to discuss this further if it would assist or please liaise with Simon if their are any queries regarding the technical content of the letter.

Many Thanks

Steve

Steve Coates
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URS Corporation Limited
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Our Ref: 44382729/BRLT0011/ARC/DJD/SC

8 September 2009

Emma Jones
Contaminated Land Officer
Neath Port Talbot County Borough Council
The Quays
Brunel Way
Baglan Energy Park
Neath SA11 2GG

**For the attention of Ms Emma Jones**

Dear Emma,

**Re: Request for acceptance of marginally elevated metals and benzo(a)pyrene concentrations at Area 1, BP Llandarcy**

This letter relates to the validation of the natural soils encountered during the latter stages of the remediation works at Area 1, Llandarcy Refinery.

The works are being validated in accordance with the agreed Llandarcy Refinery 'Area 1' Remediation Strategy dated 17th June 2006. Analytical results for the validation samples taken from natural soils have therefore been compared to the original RBSLs agreed with NPTCBC, as reported in the URS report 'Llandarcy Refinery Redevelopment, Detailed Human Health Risk Assessment, 44383634 Final Issue No 2, May 2005'.

Since the derivation of the original RBSLs, a revised zinc RBSL of 3,280mg/kg was agreed to prevent the unnecessary excavation and off-site disposal of soils with natural zinc content in excess of the RBSL, as it was not considered that observed zinc concentrations posed unacceptable risks to human health.

During the early stages of validation, marginal exceedances of the nickel SGV were passed by NPTCBC as acceptable. It was considered that the very small proportion of exceedances would not pose an unacceptable risk based on average exposure. Consideration that the average site nickel concentration and range of reported validation values on site were below the regional background values was also taken into account. During subsequent stages of validation, marginal exceedances of copper, lead, nickel and benzo(a)pyrene were also encountered in natural soils. Statistical analysis demonstrated that these materials would not pose unacceptable risks to human health, hence acceptance for these materials to remain in-situ was granted by NPT. Further details are presented in URS' letter ref. 44382729/BRLT009/DJD, dated 25 February 2009.

The purpose of this letter is to gain your agreement that the marginal metal and benzo(a) pyrene exceedances that have been encountered during the more recent stages of the validation works are acceptable. The justification for this request follows the same principles presented by URS in April

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2008[1] in relation to marginal nickel exceedances and February 2009[2] in relation to copper, lead, nickel and benzo(a)pyrene.

During recent validation works, there were 13 samples that marginally exceeded the RBSLs for arsenic, copper, lead, mercury, nickel and/or benzo(a)pyrene. These are presented in Table A (attached) and are additional to the 30 samples that marginally exceeded the RBSLs for copper, lead, nickel and/ or benzo(a)pyrene that were reported to NPT during February 2009 and for which your acceptance for these materials to remain in-situ was granted. Samples exceeding the RBSLs have been widely distributed across the validation area. Visual observations recorded during site works suggest that generally similar silty sandy gravel material was encountered at these locations.

Based on the results of recent validation works, four sampling locations have been selected for further excavation based on chemical validation failures. These proposed excavation locations are listed in Table 1 below.

**Table 1**

| Sample I.D. | Depth (m) | Rationale |
|---|---|---|
| TP011 | 0.15 | As = 130 mg/kg |
| TP164 | 0.7 | TPH = 2,500 mg/kg |
| TP165 | 0.7 | TPH = 2,900 mg/kg |
| CP_VTP018W | 0 | Pb = 1,800 mg/kg |

Figure 12 (attached) presents the locations identified for further excavation and locations of marginal chemical exceedances across the validation area. We propose that soils where marginal exceedances have been identified remain in-situ as it is considered that although the values are above the RBSLs, these values represent a minimal and acceptable risk to human health within the site context.

In support of this suggested approach, a basic statistical summary of analyte concentrations reported for the soil validation samples (excluding those reported in Table 1 above) has been summarised in Table 2 below.

[1] URS letter ref. BRLT0007 to NPTCBC dated 11th April 2008 and subsequent email communication.
[2] URS letter ref. 44382729/BRLT009/DJD, dated 25 February 2009

**Table 2**

| Parameter | Analyte | | | | | |
|---|---|---|---|---|---|---|
| | Arsenic | Copper | Lead | Mercury | Nickel | B(a)P |
| RBSL (mg/kg) | 64 | 478 | 337 | 1 | 50 | 0.9 |
| Minimum (mg/kg) | 2.8 | 6.3 | 11* | 0.25* | 8.2 | 1.2* |
| Maximum (mg/kg) | 85 | 720 | 540 | 1.3 | 93 | 4.7 |
| Mean (mg/kg) | 15.1 | 48.6 | 50.5* (50.0) | 0.453* (0.144) | 32.3 | 2.14* (0.54) |
| No. of samples | 459 | 459 | 459 | 459 | 459 | 470 |
| No. of non-detects | 0 | 0 | 5 | 433 | 0 | 459 |
| No. of exceedances | 4 | 3 | 5 | 1 | 35 | 11** |
| % Exceedances | 0.9 | 0.7 | 1.1 | 0.2 | 7.6 | 2.3** |
| Standard deviation (mg/kg) | 12.5 | 63.7 | 66.8* | 0.23* | 11.5 | 1.00* |
| Distribution | Non-parametric | Non-parametric | Non-parametric* | Lognormal* and approximate Gamma* | Non-parametric | Gamma* |
| UCL (mg/kg) | 17.6 | 61.5 | 55.5 | 0.267 | 33.2 | 1.24 |
| Type of UCL | 95% Chebyshev | 95% Chebyshev | 95% Kaplan-Meier (BCA) | 95% Kaplan-Meier (t) | 95% Student's-t or 95% Modified-t | 95% Kaplan-Meier (t) |

Maximum values are from those samples that remain in-situ at the site and that which are not scheduled for additional excavation.
* values exclude non-detects
(xx.x) values in brackets indicate the mean value where non-detects are replaced by half the method detection limit
** MDL exceeds RBSL therefore all detected concentrations reported as exceedances. Non-detects not reported as exceedances.

These values have been calculated using the USEPA ProUCL4.0 statistical software, which has the advantage of recommending a UCL appropriate to the identifiable data distribution. The aim of this statistical analysis is to enable a comparison with background data, and should not be viewed as a detailed statistical analysis undertaken for specific averaging areas akin to the approach promoted by the CIEH/CL:AIRE guidance.

Table 3 presents the range of values for metals in local soils as reported by the BGS dataset. For B(a)P and mercury, an indication of the average urban soil concentrations is presented based on the Environment Agency's soil and herbage survey carried out for the UK and NI.

**Table 3**

| Parameter | BGS Local Background Concentration (mg/kg) | | | | EA Urban Soil Concentration (mg/kg) | | | |
|---|---|---|---|---|---|---|---|---|
| | Arsenic | Copper | Lead | Nickel | Mercury Wales | Mercury UK & NI | B(a)P Wales | B(a)P UK & NI |
| Minimum | 8 | 7 | 20 | 8 | 0.074 | 0.07 | 0.095 | 0.006 |
| Maximum | 2047 | 1,447 | 14,714 | 349 | 0.314 | 1.53 | 1.020 | 31.20 |
| Mean | 76.8 | 161.2 | 430.6 | 48.5 | 0.139 | 0.350 | 0.469 | 0.878 |
| No. of samples | 375 | 375 | 375 | 375 | 9 | 87 | 9 | 87 |

Based on the information presented in Tables 2 and 3, the ranges of arsenic, copper, lead and nickel concentrations taken from the site validation samples are within the range of concentrations expected in local background soils. In addition, the 95% UCLs of the datasets are lower than their respective RBSLs. There is no compelling case that these results do not simply reflect the variability in the material composition, such that the 95% UCL is a reasonable and conservative representation of typical soil quality in this validation area.

The concentration ranges of mercury and benzo(a)pyrene identified in the validation data in Table 2 are similar to the typical urban soil concentrations reported by the EA for the UK and Northern Ireland. In addition, the mean and 95% UCL concentrations of mercury in the validation data are below the RBSL. There is therefore little evidence to support the additional excavation of minor mercury exceedances given that they could be representative of general urban soils and the average concentrations are unlikely to pose a significant risk to future site users.

The mean B(a)P concentration (including non-detects at half the MDL) is below the RBSL, whilst the 95% UCL B(a)P concentration is slightly in excess of the RBSL. However, given that the mean B(a)P concentration is similar to the mean concentrations in urban soils as reported by the EA, there is little evidence to support the additional excavation of the minor exceedances.

To further support our suggested approach, consideration can also be given to the following:

**Metals:**

- The lead RBSL was set on the basis of the background LCL in accordance with the original RBSL methodology, which incorporated phytotoxic considerations as well as human health. This RBSL is lower than the former lead SGV of 450mg/kg as well as current URS (interim) GAC based on the updated 2009 CLEA methodology. Therefore, minor exceedances of this RBSL do not necessarily indicate a significant risk to future site users.
- No human health-based RBSL was originally presented for copper due to its low toxicity. The maximum reported copper concentration for which acceptance to remain in-situ is requested is 500mg/kg (and lower than the previous maximum of 720 mg/kg, for which acceptance to remain in-situ was granted by NPT). Typically human health-based generic screening values for copper are an order of magnitude higher than the current RBSL of 478mg/kg. For example, the LQM/CIEH 2$^{nd}$ edition GAC based on the updated 2009 CLEA methodology is 2,330mg/kg. Therefore, minor exceedances of the RBSL do not necessarily indicate a significant risk to future site users.
- A single mercury sample (concentration of 1.3mg/kg) exceeds the RBSL of 1mg/kg. Given that a large majority of samples have not identified mercury in excess of the method detection limit, this single minor exceedance is not considered to represent a significant source since it is below the maximum value identified in typical urban soils in the UK&NI. Therefore the

average concentration is considered to be an appropriate representation of the presence of mercury. Since the mean mercury concentration and the 95% UCL mercury concentration are both below the RBSL, there is not considered to be a case for further excavation of the minor mercury exceedance.

- The mean concentrations and corresponding 95% UCL concentrations of arsenic and nickel correspond well, indicating a good degree of confidence in the datasets. Both of these averages for both metals are below the RBSLs, and the maximum values are closer to the mean background rather than the maximum background concentrations reported by the BGS.

**Benzo(a)pyrene**

- There were only 11 marginal B(a)P exceedances identified across the site. Results do not indicate a specific zone with elevated B(a)P concentrations. Nine of the B(a)P exceedances were in the surface samples (0.1m or 0.15m bgl) and the other 2 were within shallow soil at 0.7m bgl).
- For all soil samples with identified B(a)P exceedances, subsequent (or shallower) depths did not contain B(a)P at a concentration in excess of the MDL, indicating a very limited source presence at each of these locations.
- Visual evidence of specifically different material was not noted at any of the locations therefore it is considered that reported concentrations are not likely to represent significant volumes of soil but more likely is characterised by the inherent variability in the soil at a much smaller scale.
- Given the nature of the activities that have been carried out on site, the typically shallow elevated samples are likely to be due to the presence of fragments of residual materials from the overlying Made Ground that has been removed. The minor exceedances reported are therefore not considered to be truly representative of the properties of the remaining materials but rather represent highly isolated, small pockets of reworked natural ground that could not be considered as a significant source.

A measure of the average concentration is considered to be a more reasonable method for assessing the significance of the B(a)P concentrations detected. The mean concentration of 0.54mg/kg is below the RBSL of 0.9mg/kg. The maximum B(a)P concentration was 4.7 mg/kg, and in the context of the data analysis presented, the reported concentrations pose only a minimal and an acceptable risk to human health.

We believe it is reasonable to conclude that the reported concentrations marginally above the RBSLs are not likely to pose an unacceptable risk to human health. We would be grateful if you would indicate whether you are willing to accept these lines of evidence as sufficient justification for our proposals to leave in-situ the marginal exceedances described above. We would appreciate your earliest response in this issue as it key to progressing with the development of the site.

The initial validation process has been completed across the whole of Area 1, with only those locations presented in Table 1 to be excavated and subsequently re-validated. Further final validation will be undertaken within each of the garden plots as the development of the site progresses. We will keep you informed if any further anomalies in the data require further consideration.

URS

If you have any queries regarding this, please do not hesitate to contact the undersigned.

Yours sincerely
**URS Corporation Ltd**



Simon Cole
Technical Director – Human Health Risk Assessment UK & Ireland
**URS Corporation Ltd**

Enc.

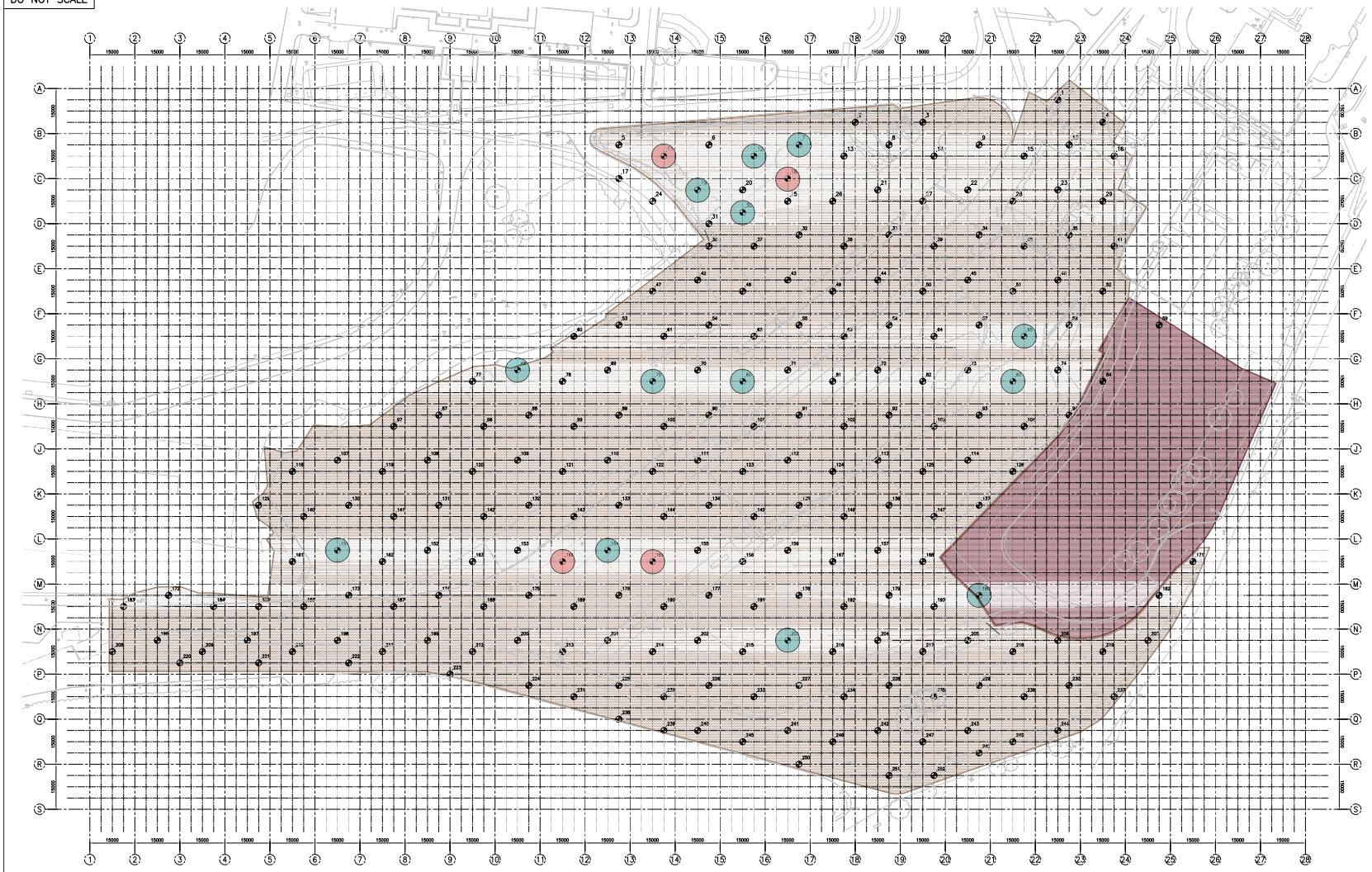
Table A: Soil Locations with Marginal RBSL Exceedances Requiring Approval to Remain In-situ
Figure 12: Validation Sample Setting Out

## Table A: Soil Locations with Marginal RBSL Exceedances Requiring Approval to Remain In-situ

| Location | Depth | Benzo(a)Pyrene | Arsenic | Copper | Lead | Mercury | Nickel |
|---|---|---|---|---|---|---|---|
| RBSL | | 0.9 | 64 | 478 | 337 | 1 | 50 |
| TP007 | 0.15 | -1 | **85** | 83 | 57 | -1 | 23 |
| | 1 | -1 | 21 | 81 | 31 | -1 | 30 |
| TP012 | 0.15 | -1 | **76** | 220 | 110 | -1 | **51** |
| | 0.5 | -1 | 56 | 170 | 74 | -1 | 37 |
| TP019 | 0.15 | -1 | 51 | 140 | 62 | -1 | 33 |
| | 0.4 | -1 | **67** | 190 | 64 | -1 | 32 |
| CP_VTP030 | 0.15 | **2.4** | 18 | 57 | 100 | -1 | 33 |
| CP_VTP030S | 0 | **2.3** | n/a | n/a | n/a | n/a | n/a |
| CP_VTP030W | 0 | **1.6** | n/a | n/a | n/a | n/a | n/a |
| CP_VTP030B | 0 | **1.5** | n/a | n/a | n/a | n/a | n/a |
| CP_VTP065 | 0.15 | -1 | 7.4 | 8.8 | 25 | -1 | **66** |
| | 0.65 | -1 | 5.9 | 180 | 25 | -1 | **53** |
| TP068 | 0.1 | -1 | 12 | 54 | 140 | -1 | 48 |
| | 0.5 | -1 | 8 | 37 | 40 | -1 | **51** |
| TP079 | 0.1 | -1 | 8.5 | 35 | 120 | 0.31 | **54** |
| TP080 | 0.1 | -1 | **68** | **550** | 140 | 0.29 | 26 |
| | 0.7 | -1 | 7 | 18 | 18 | -1 | 25 |
| | 1.2 | -1 | 6.9 | 16 | 48 | -1 | 25 |
| CP_VTP083 | 0.15 | -1 | 49 | 160 | **540** | -1 | 25 |
| | 0.5 | -1 | 14 | 43 | 63 | -1 | 19 |
| TP151 | 0.1 | -1 | 13 | 46 | 35 | -1 | **68** |
| TP154 | 0.1 | n/a | 29 | 82 | 190 | **1.3** | 31 |
| CP_VTP180 | 0.2 | -1 | 16 | 47 | 44 | -1 | 26 |
| | 1 | -1 | 6.2 | 38 | 27 | -1 | **54** |
| | 1.3 | -1 | 12 | 39 | 32 | -1 | 33 |
| TP203 | 0.2 | -1 | 17 | 91 | 33 | -1 | **59** |

RBSL - Risk Based Screening Level
n/a - not applicable (previously met RBSL for given compound prior to re-sampling)
Minus one indicates a value below the method detection limit

DO NOT SCALE



POINT SETOUT COORDINATES

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 271796832E | 195729064N | 51 | 271771832E | 195665314N | 101 | 271485582E | 195620314N | 151 | 271544832E | 195579064N | 201 | 271636832E | 195549064N |
| 2 | 271719332E | 195721564N | 52 | 271801832E | 195665314N | 102 | 271715582E | 195620314N | 152 | 271576832E | 195579064N | 202 | 271666832E | 195549064N |
| 3 | 271741832E | 195721564N | 53 | 271740582E | 195654064N | 103 | 271645582E | 195620314N | 153 | 271608832E | 195579064N | 203 | 271696832E | 195549064N |
| 4 | 271801832E | 195721564N | 54 | 271670582E | 195654064N | 104 | 271775582E | 195620314N | 154 | 271636832E | 195579064N | 204 | 271726832E | 195549064N |
| 5 | 271640582E | 195714064N | 55 | 271700582E | 195654064N | 105 | 271805582E | 195620314N | 155 | 271666832E | 195579064N | 205 | 271756832E | 195549064N |
| 6 | 271670582E | 195714064N | 56 | 271730582E | 195654064N | 106 | 271835582E | 195620314N | 156 | 271696832E | 195579064N | 206 | 271786832E | 195549064N |
| 7 | 271700582E | 195714064N | 57 | 271760582E | 195654064N | 107 | 271548832E | 195609064N | 157 | 271726832E | 195579064N | 207 | 271816832E | 195549064N |
| 8 | 271730582E | 195714064N | 58 | 271790582E | 195654064N | 108 | 271578832E | 195609064N | 158 | 271756832E | 195579064N | 208 | 271471832E | 195545314N |
| 9 | 271760582E | 195714064N | 59 | 271820582E | 195654064N | 109 | 271608832E | 195609064N | 159 | 271786832E | 195579064N | 209 | 271501832E | 195545314N |
| 10 | 271790582E | 195714064N | 60 | 271625582E | 195650314N | 110 | 271638832E | 195609064N | 160 | 271816832E | 195579064N | 210 | 271531832E | 195545314N |
| 11 | 271685582E | 195710314N | 61 | 271655582E | 195650314N | 111 | 271668832E | 195609064N | 161 | 271531832E | 195573531N | 211 | 271561832E | 195545314N |
| 12 | 271685582E | 195710314N | 62 | 271685582E | 195650314N | 112 | 271698832E | 195609064N | 162 | 271561832E | 195573531N | 212 | 271591832E | 195545314N |
| 13 | 271715582E | 195710314N | 63 | 271715582E | 195650314N | 113 | 271728832E | 195609064N | 163 | 271591832E | 195573531N | 213 | 271621832E | 195545314N |
| 14 | 271745582E | 195710314N | 64 | 271745582E | 195650314N | 114 | 271758832E | 195609064N | 164 | 271621832E | 195573531N | 214 | 271651832E | 195545314N |
| 15 | 271775582E | 195710314N | 65 | 271775582E | 195650314N | 115 | 271788832E | 195609064N | 165 | 271651832E | 195573531N | 215 | 271681832E | 195545314N |
| 16 | 271805582E | 195710314N | 66 | 271805582E | 195650314N | 116 | 271818832E | 195609064N | 166 | 271681832E | 195573531N | 216 | 271711832E | 195545314N |
| 17 | 271640582E | 195702814N | 67 | 271835582E | 195650314N | 117 | 271848832E | 195609064N | 167 | 271711832E | 195573531N | 217 | 271741832E | 195545314N |
| 18 | 271696832E | 195702814N | 68 | 271640582E | 195639064N | 118 | 271518832E | 195605314N | 168 | 271741832E | 195573531N | 218 | 271771832E | 195545314N |
| 19 | 271696832E | 195689064N | 69 | 271670582E | 195639064N | 119 | 271548832E | 195605314N | 169 | 271771832E | 195573531N | 219 | 271801832E | 195545314N |
| 20 | 271681832E | 195689064N | 70 | 271696832E | 195639064N | 120 | 271578832E | 195605314N | 170 | 271801832E | 195573531N | 220 | 271843332E | 195537814N |
| 21 | 271726832E | 195689064N | 71 | 271696832E | 195639064N | 121 | 271621832E | 195605314N | 171 | 271631832E | 195575531N | 221 | 271520582E | 195541564N |
| 22 | 271756832E | 195689064N | 72 | 271726832E | 195639064N | 122 | 271651832E | 195605314N | 172 | 271640582E | 195564064N | 222 | 271670582E | 195534064N |
| 23 | 271786832E | 195689064N | 73 | 271756832E | 195639064N | 123 | 271681832E | 195605314N | 173 | 271550582E | 195564064N | 223 | 271584332E | 195537814N |
| 24 | 271816832E | 195689064N | 74 | 271786832E | 195639064N | 124 | 271711832E | 195605314N | 174 | 271580582E | 195564064N | 224 | 271610582E | 195534064N |
| 25 | 271696832E | 195685314N | 75 | 271816832E | 195639064N | 125 | 271741832E | 195605314N | 175 | 271610582E | 195564064N | 225 | 271640582E | 195534064N |
| 26 | 271771832E | 195685314N | 76 | 271846832E | 195639064N | 126 | 271771832E | 195605314N | 176 | 271640582E | 195564064N | 226 | 271670582E | 195534064N |
| 27 | 271741832E | 195685314N | 77 | 271591832E | 195635314N | 127 | 271801832E | 195605314N | 177 | 271670582E | 195564064N | 227 | 271700582E | 195534064N |
| 28 | 271771832E | 195685314N | 78 | 271621832E | 195635314N | 128 | 271831832E | 195605314N | 178 | 271700582E | 195564064N | 228 | 271730582E | 195534064N |
| 29 | 271801832E | 195685314N | 79 | 271651832E | 195635314N | 129 | 271520582E | 195594064N | 179 | 271730582E | 195564064N | 229 | 271760582E | 195534064N |
| 30 | 271681832E | 195681564N | 80 | 271681832E | 195635314N | 130 | 271550582E | 195594064N | 180 | 271760582E | 195564064N | 230 | 271790582E | 195534064N |
| 31 | 271670582E | 195678814N | 81 | 271711832E | 195635314N | 131 | 271580582E | 195594064N | 181 | 271790582E | 195564064N | 231 | 271625582E | 195533031N |
| 32 | 271700582E | 195680064N | 82 | 271741832E | 195635314N | 132 | 271610582E | 195594064N | 182 | 271820582E | 195564064N | 232 | 271655582E | 195533031N |
| 33 | 271730582E | 195680064N | 83 | 271771832E | 195635314N | 133 | 271640582E | 195594064N | 183 | 271475582E | 195560314N | 233 | 271685582E | 195533031N |
| 34 | 271790582E | 195680064N | 84 | 271801832E | 195635314N | 134 | 271670582E | 195594064N | 184 | 271505582E | 195560314N | 234 | 271715582E | 195533031N |
| 35 | 271760582E | 195680064N | 85 | 271831832E | 195635314N | 135 | 271700582E | 195594064N | 185 | 271520582E | 195560314N | 235 | 271745582E | 195533031N |
| 36 | 271670582E | 195680314N | 86 | 271861832E | 195635314N | 136 | 271730582E | 195594064N | 186 | 271535582E | 195560314N | 236 | 271775582E | 195533031N |
| 37 | 271685582E | 195680314N | 87 | 271580582E | 195624064N | 137 | 271760582E | 195594064N | 187 | 271565582E | 195560314N | 237 | 271805582E | 195533031N |
| 38 | 271715582E | 195680314N | 88 | 271610582E | 195624064N | 138 | 271790582E | 195594064N | 188 | 271595582E | 195560314N | 238 | 271640582E | 195522281N |
| 39 | 271745582E | 195680314N | 89 | 271640582E | 195624064N | 139 | 271820582E | 195594064N | 189 | 271625582E | 195560314N | 239 | 271655582E | 195519064N |
| 40 | 271775582E | 195680314N | 90 | 271670582E | 195624064N | 140 | 271535582E | 195590314N | 190 | 271655582E | 195560314N | 240 | 271670582E | 195519064N |
| 41 | 271805582E | 195680314N | 91 | 271700582E | 195624064N | 141 | 271565582E | 195590314N | 191 | 271685582E | 195560314N | 241 | 271696832E | 195519064N |
| 42 | 271696832E | 195680064N | 92 | 271730582E | 195624064N | 142 | 271595582E | 195590314N | 192 | 271715582E | 195560314N | 242 | 271726832E | 195519064N |
| 43 | 271696832E | 195689064N | 93 | 271760582E | 195624064N | 143 | 271625582E | 195590314N | 193 | 271745582E | 195560314N | 243 | 271756832E | 195519064N |
| 44 | 271726832E | 195689064N | 94 | 271790582E | 195624064N | 144 | 271655582E | 195590314N | 194 | 271775582E | 195560314N | 244 | 271786832E | 195519064N |
| 45 | 271756832E | 195689064N | 95 | 271820582E | 195624064N | 145 | 271685582E | 195590314N | 195 | 271805582E | 195560314N | 245 | 271681832E | 195515314N |
| 46 | 271786832E | 195689064N | 96 | 271850582E | 195624064N | 146 | 271715582E | 195590314N | 196 | 271486832E | 195549064N | 246 | 271711832E | 195515314N |
| 47 | 271651832E | 195685314N | 97 | 271580582E | 195620314N | 147 | 271745582E | 195590314N | 197 | 271516832E | 195549064N | 247 | 271741832E | 195515314N |
| 48 | 271681832E | 195685314N | 98 | 271610582E | 195620314N | 148 | 271775582E | 195590314N | 198 | 271546832E | 195549064N | 248 | 271771832E | 195515314N |
| 49 | 271711832E | 195685314N | 99 | 271640582E | 195620314N | 149 | 271805582E | 195590314N | 199 | 271576832E | 195549064N | 249 | 271801832E | 195515314N |
| 50 | 271741832E | 195685314N | 100 | 271670582E | 195620314N | 150 | 271835582E | 195590314N | 200 | 271606832E | 195549064N | 250 | 271700582E | 195507814N |
| | | | | | | | | | | | | 251 | 271730582E | 195504064N |
| | | | | | | | | | | | | 252 | 271745582E | 195504064N |

## Key

1. REMEDIATION BOUNDARY BASED ON ROBERT ADAMS ARCHITECTS DRAWING RECEIVED BY E-MAIL ON 11.09.06
2. VALIDATION SAMPLING AND TESTING TO BE IN ACCORDANCE WITH PROTOCOLS SET IN PERFORMANCE SPECIFICATION FOR REMEDIATION CONTRACT, 44382624, ISSUE 2 FINAL DATED 27.7.06.
3. CONTRACTOR TO NOTIFY AND AGREE SUPERVISIOR IN ADVANCE IF ANY LOCATIONS ARE TO BE ALTERED FROM THOSE SHOWN.
4. CONTRACTOR TO PROVIDE SURVEY CO-ORDINATES FOR ACTUAL LOCATIONS SAMPLED.

LOCATIONS FOR FURTHER EXCAVATION

MARGINAL CHEMICAL EXCEEEDANCES FOR As, Cu, Pb, Hg, Ni or B(a)P FOR WHICH ACCEPTENCE WITHOUT EXCAVATION IS SOUGHT

LOWER CAR PARK - VALIDATION TRIAL PITTING NOT REQUIRED.

VALIDATION AREA.

TRIAL PITS.

0 15 30 45 Meters

| | |
|---|---|
| Title | VALIDATION SAMPLE - SETTING OUT |
| Location | AREA 1, LLANDARCY |
| Client | BP LLANDARCY REFINERY |

URS

| App'd: | Drawn: | Date: |
|---|---|---|
| SC | LCH | SEPT 2009 |
| Status: DRAFT | | Ref: SC/BRIS/LCH/BRS |
| Scale: AS SHOWN | | Job No: 44382729 |
| Drg. Size: A0 | | FIGURE 12 |

CAD Ref: 44382464.0014a

M:\Bristol-Marketing\Technical Illustration\TI Jobs on Bristol\BP\44382729_BP Llandarcy Refinery\Figures

**Alex Cowin/Manchester/URSCorp**
23/09/2009 15:54

To jsmith@stmodwen.co.uk, Ian.Roberts@ECHarris.com
cc Steve Coates/Bristol/URSCorp@URSCORP
bcc
Subject Fw: Exceedences Area 1 Llandarcy

History: This message has been forwarded.

----- Forwarded by Alex Cowin/Manchester/URSCorp on 22/09/2009 21:17 -----

**"Emma Jones" <e.k.jones@neath-porttalbot.gov.uk>**
22/09/2009 15:40

To <simon_cole@urscorp.com>
cc <Alex_Cowin@URSCorp.com>
Subject RE: Exceedences Area 1 Llandarcy

Simon,

**RE: Request for acceptance of marginally elevated metals and benzo(a)pyrene concentrations at Area 1, BP Llandarcy - Letter report dated 8th September 2009.**

Thankyou for the clarification below. I can confirm the approach and justification used in this report follows the same principles outlined in previous correspondence and approval by NPT. With the exception of Mercury, exceedences for Lead, Copper, Arsenic, Nickel and Benzo(a)pyrene have been reviewed previously during the earlier stages of validation at Area 1 and I would therefore again agree with the justification presented and also the supporting information provided in relation to Mercury.

Regards

Emma Jones

Emma Jones
Contaminated Land Officer
Neath Port Talbot County Borough Council
The Quays
Brunel Way
Baglan Energy Park
Neath
SA11 2GG
Tel. 01639 686521

---

**From:** Alex_Cowin@URSCorp.com [mailto:Alex_Cowin@URSCorp.com]
**Sent:** 22 September 2009 15:05
**To:** Emma Jones
**Cc:** Simon_Cole@URSCorp.com
**Subject:** Fw: Exceedences Area 1 Llandarcy

Hi Emma,

With regards to your below query to Simon, the four B(a)P exceedances were from the one validation trial pit

(VTP030).

I have provided some further information in the below table, which shows that following the B(a)P exceedance from a composite sample collected on 5th March, each of the four sides (E,N,S,W denotes direction) and base (B) were sampled on 20th May. Those samples from the base, south and west faces marginally exceed the RBSL.

| Location | Depth | Date | B(a)P (mg/kg) | Comment |
|---|---|---|---|---|
| TP030 | 0.15 | 05/03/2008 | **2.4** | Composite sample |
| TP030B | 0 | 20/05/2008 | **1.5** | Base sample |
| TP030E | 0 | 20/05/2008 | *ND* | Eastern face. Non-detect. Passed RBSL |
| TP030N | 0 | 20/05/2008 | *ND* | Northern face. Non-detect. Passed RBSL |
| TP030S | 0 | 20/05/2008 | **2.3** | Southern face. |
| TP030W | 0 | 20/05/2008 | **1.6** | Western face |

Hopefully this answers your query but please let me know if not.

Regards,

Alex.

Alex Cowin
Principal Consultant

URS Corporation Ltd, 4th Floor, St. James' Building, 61-95 Oxford Street, Manchester, M1 6FQ
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URS Corporation Limited
Place of registration: Scotland
Registered number: 118271
Registered office: 243 West George Street, Glasgow G2 4QE

----- Forwarded by Simon Cole/Cardiff/URSCorp on 22/09/2009 11:42 -----

**"Emma Jones"**
**<e.k.jones@neath-porttalbot.gov.uk>**

22/09/2009 11:34

To<simon_cole@urscorp.com>

cc

SubjectExceedences Area 1 Llandarcy

Hi Simon,

I am currently reviewing the information submitted on 8th September relating to exceedences at Area 1. I would appreciate clarification on one issue relating to the exceedences of Benzo(a)pyrene from the 4 locations highlighted in Table A. Is this just one location with 4 samples or a cluster of 4 sample points, its unclear on the map provided or sample reference?

Regards
Emma

Emma Jones
Contaminated Land Officer
Neath Port Talbot County Borough Council
The Quays
Brunel Way
Baglan Energy Park
Neath

SA11 2GG

Tel: 01639 686521

# Appendix C - Cliff-face Watching Brief Report

Our Ref: 44382729/BRLT00003/MC/SC
Your Ref:

15 November 2007

BP Llandarcy Refinery Ltd
Llandarcy
Neath
W. Glamorgan SA10 6HJ

**For the attention of Mr John Smith**

Dear John

**Re: Findings of the Cliff-Face Watching Brief**
**Area 1, BP Llandarcy Refinery**

URS is pleased to provide this letter report to BP Llandarcy Refinery Ltd (BPLR) outlining the findings of a programme of observations of the 'high wall' of the former sandstone quarry in the northern part of Area 1.

**Background and History**

URS was retained by BPLR under a Services Agreement with BP dated 10th October 2006 (under Master Services Agreement 280205, dated 28th February 2005), to undertake a survey of the cliff-face at the northern edge of the Area 1 plot.

Area 1 is the first parcel of the former BP Llandarcy Refinery complex to be taken forward for residential redevelopment. As part of the run-up to this process, the area has undergone a number of different programmes of investigation and, where required, remedial work. The location of Area 1 is shown on Figure 1, below.

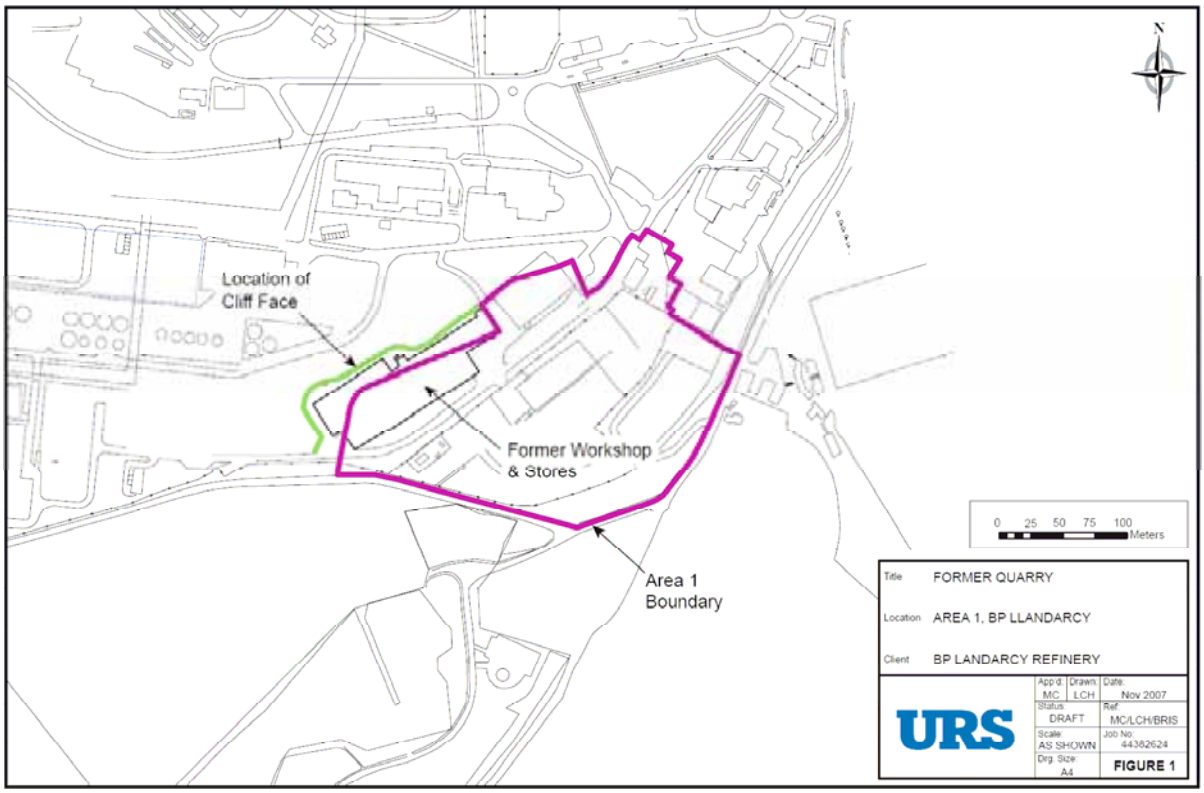
The northern part of Area 1 terminates in an area historically used as a sandstone quarry (see Figure 1), which was advanced into the south/southeasterly-facing slope. This operation left a quarry 'high-wall', or near-vertical cliff face approximately 15 metres in height at its highest point. This faces generally to the southeast, but also has a substantial east-facing cliff at its western-end.

During refinery development, the quarry feature was used by the refinery to locate the workshops and stores, a large building with metal working facilities, storage for fittings and components, and cleaning operations for refinery infrastructure. In addition, some offices were situated at the eastern end of the building.

During earlier phases of investigation at the refinery by URS (in 1998, after the closure announcement), occasional hydrocarbon sheens and odours were observed emanating from discrete fractures in the western end of the cliff-face. Although no formal inspection programme was in place at that time, the discharge appeared to be related to recharge, with heavier sheens appearing to be present during wetter periods, when seepage from the cliff-face in the western end of the quarry was greatest.

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Certificate No. FS21618

URS




After a period of post-refinery use by local engineering firms, demolition of the warehouse and stores buildings was completed in 2006, in readiness for remedial works to be undertaken ahead of the Area 1 redevelopment programme. Remedial works in the location of the former quarry comprised:

- A limited programme of source-reduction in the area used to degrease components used in the refinery. This has been provided to BPLR under a separate cover, and;
- A 'watching brief' on the cliff-face to note key areas of water seepage from the sandstone, and if and where hydrocarbon discharges were occurring.

**Objectives and Scope**

Objectives

The objectives of the programme were as follows:

- Establish a baseline of:
    1. the key drainage features and zones in the cliff-face;
    2. areas of hydrocarbon seepage, or areas where this may have occurred previously
- undertake a programme of inspections to facilitate comparison of 1 & 2 with the baseline event
- prepare a short summary report of the findings of the inspection programme.

Scope

To meet the specified objectives, URS undertook the following Scope of Works:

- Collation of existing data from previous investigations in the immediate vicinity of the quarry (eg, assessment of the location of former infrastructure, borehole logs, water sample quality data);
- a walkover survey of the cliff-face, from above and below. This was undertaken after the cliff had been 'cleaned' of loose debris;

- Establishment of a baseline, through an initial inspection, against which other data could be compared. This was achieved by establishing stations from which a photographic panorama was made, and investigation of the key areas of seepage for indications of hydrocarbon discharge. The baseline assessment was undertaken on April 5th, 2006;
- Undertake additional photographic and cliff-face inspections, as conditions and access to the site allowed, to allow comparison and documentation of key drainage features and areas of potential hydrocarbon seepage.
- Photographs were taken at approximately monthly intervals up until October 2007. Inspections were undertaken for the first few months of the programme, but scaled back, in response to an absence of change in condition, and to reduce the need for access (climbing) the wet rock face. For completeness, however, a final visual and olfactory inspection was undertaken on November 15th, 2007;
- Assessment and evaluation of the data collected, as part of;
- The preparation of this summary report.

**Findings**

Potential Contaminant Sources

The Desk Study information identified a number of refining operations to have been present immediately west of the western end of the cliff face, no more than 50 metres distance from the cliff face. Former refinery personnel had identified the closest tanks as being associated with the 'Merox' production process.

The walkover survey identified the plinths of these tanks to still be present, as well as old bunding separating the individual tanks. Anecdotal information provided by refinery personnel have previously identified the 'Merox Area' as potentially contaminative process.

The walkover survey also identified an abandoned pipeline running along the top of the 'promontory'. It is unclear what this pipeline carried.

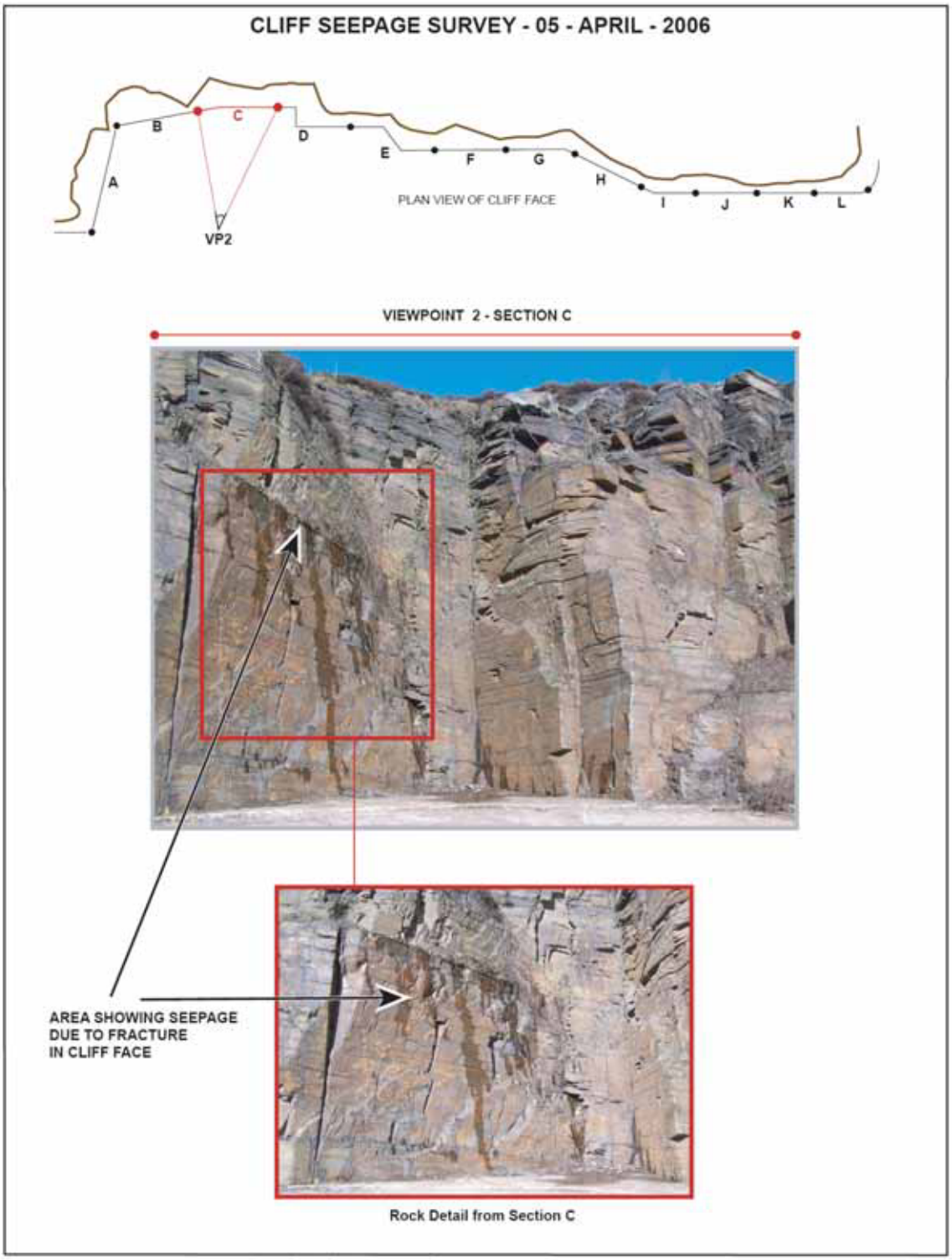
Geology

The rock formation comprises a sequence of both massive, and less massive, predominantly sandstone beds, with frequent cross-bedding noted. The sandstone is lithified, with clear separations between the different depositional beds, typically marked by a bedding plane, which often also represents a fracture, or open space along which fluids are more likely to flow. The bedding dips generally to the north at approximately 20 degrees. The dip of the bedding is believed to result in fluids preferentially discharging northwards, by 'running' down the dip-slope. This is supported by discharges occurring in the road cutting north of the cliff face.

In addition to the bedding fractures, sub-vertical tectonic joint sets are also noted. In combination with the bedding fractures, these joints are believed to provide the principal means by which fluid movement occurs in the sandstone. This is illustrated by the discharge observed to be occurring from the fractures in the cliff face. URS would point out, however, that not all of the fractures discharge fluid, suggesting that not all are interconnected with one another. However, in the west of the quarry, one bedding fracture is particularly prominent, and appears to drain much of the water from the formation above it. This is shown on Figure 2.

Geologically, the cliff, and underlying sandstone rocks are typical of the carboniferous coal measure sandstones of the area. The cliff forms the southern side of a raised 'promontory' of land, with the road cutting to the north forming the other. Effects that appear to result from the presence of this 'promontory' formed of fractured sandstone appear to be: first, that recharge is predominantly from the direct effects of rainfall; only a thin soil cover separates the rainfall from the bedrock, and; second, that rapid drainage of this recharge out of the system seems to occur as the bedding planes and fractures which act to drain the water entering the system are truncated by the cliff face to the south, and the road cutting to the north. This is discussed in more detail below.

URS




| | | | |
|---|---|---|---|
| URS | App'd: MC / Drawn: LCH / Date: APRIL 2006 | Title | CLIFF SEEPAGE SURVEY - 05 APRIL 2006 -VIEWPOINT 2 (SECTION C) |
| | Status: DRAFT / Ref: MC/LCH/BRIS | Location | BP OIL REFINERY, LLANDARCY - AREA 1 |
| | Scale: NTS / Job No: 44382624 | Client | BP OIL REFINERY, LLANDARCY |
| | Drg. Size: A3 / FIGURE 2 | | |

Seepages

As noted above, seepage to the cliff-face of the quarry is controlled by the presence and orientation of fractures present within the rock, and the availability of recharge. The inspection and photographic

programme has demonstrated consistently that there are a limited number of 'key' fractures from which the majority of the seepage occurs, and that this occurs principally in the western end of the quarry. In particular, one bedding plane fracture near the top of the cliff-face in the west of the quarry appears to convey much of the drainage from overlying rock and soil. This is observed during both dry and wet conditions, though the seepage rate was higher during wetter periods. Vegetation appears to grow preferentially along this line of seepage. This area of seepage is illustrated in Figure 2.

Seepage from the fractures infrequently occurs as a 'trickle', and when it does, this is typically following periods of higher recharge. Generally, the seepage from the fractures can be viewed as 'sweating' water.

For much of the remainder of the quarry wall to the east, very little seepage is noted, and it is believed that this is due to the northerly-dipping bedding planes, and the presence of the rock cutting to the north, which, on this basis, appears to receive much of the drainage from the high ground to the north and west of the quarry.

Indications of Contamination

Inspection of seepage points was limited to those that could safely be accessed on foot. Areas of seepage higher up the quarry wall were therefore not closely inspected. In addition, indications of contamination were limited to observations, ie, no analytical samples were collected. The initial inspection suggested that a faint, almost imperceptible hydrocarbon odour was present on the wet surface of the rockface at a single location in the west of the quarry. The location is noted on Figure 3. Later inspections also confirmed these conditions. URS would note that while a trained professional was able to identify the presence of hydrocarbon, it would be less-perceptible to a member of the public.

Sheens were also reported on the rockface, however, closer inspection suggested that these are not composed of hydrocarbon, but rather from a solid 'platy' material, rather than liquid. In addition, they are odourless. These materials are believed to be iron precipitates as are commonly observed in areas of standing or slow-moving water.

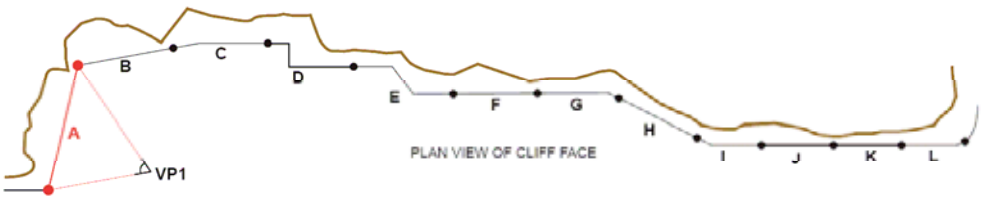
Based on anecdotal information reported by staff who were present during the investigations undertaken in 1998, there used to be a more visible hydrocarbon seepage, with a correspondingly stronger hydrocarbon odour at the same location. Subsequent informal visits between 1998 and the time of the inspection programme, suggest that the seepage has continued to decrease to its most-recently observed condition.

Collectively, these data suggest that conditions have abated significantly since 1998, probably as a result of both dilution and degradation of the hydrocarbon in the water. The near constant seepage appears to support the presence of significant dilution. The degradation of hydrocarbons in the water is supported by the presence of iron precipitates forming coincident with a number of the seepages in the west end of the quarry. Within the wider Llandarcy database, there is strong circumstantial evidence of these precipitates being associated with the degradation of lighter hydrocarbon fractions at the site.

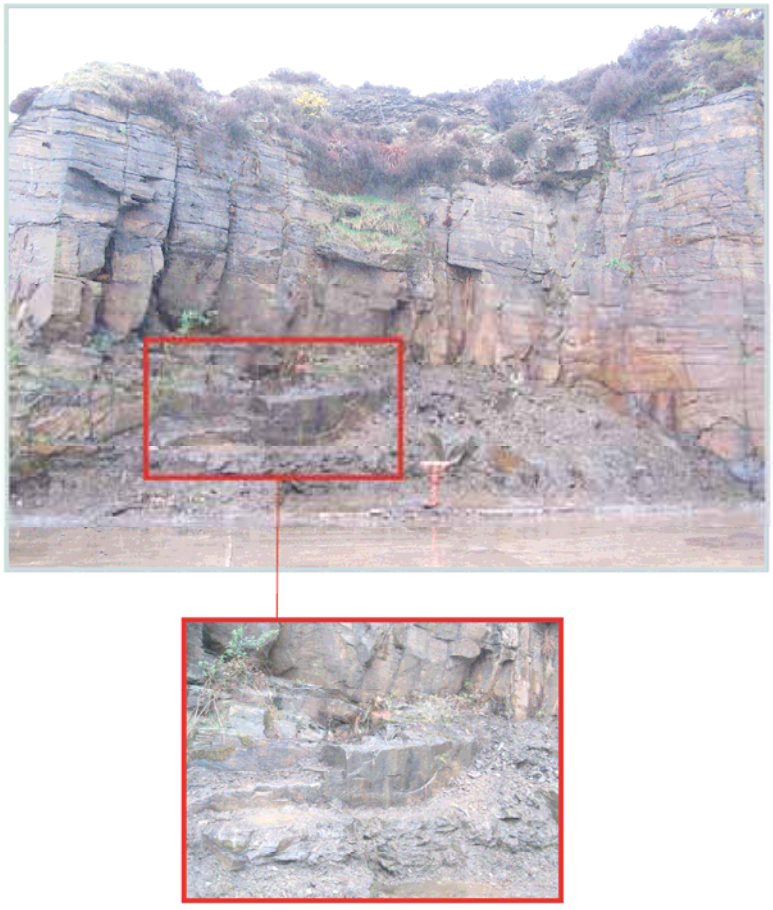
The results of analytical sampling of a monitoring well installed between the tanks and the cliff (WSTP121) during investigative works in 2003/4 (ref: URS Report DR1209, Factual Whole Site Investigation Report, June 1, 2004) indicated low concentrations of hydrocarbon (diesel range organics, 29 ug/l) in the closest borehole between the cliff face and the former Merox plant tanks. Samples have not been collected from this well since that time. The concentrations observed appear confirmed by a borehole installed at the base of the cliff (P1AF006), which exhibited a similar concentration.

URS

CLIFF SEEPAGE SURVEY - 20 - APRIL - 2006




VIEWPOINT 1 - SECTION A



Rock Detail from Section A

SHOWING AREA OF SEEPAGE
WITH WEAK HYDROCARBON
ODOUR DURING BASELINE SURVEY

| | | | |
|---|---|---|---|
| URS | App'd: MC | Drawn: LCH | Date: APRIL 2006 |
| | Status: DRAFT | | Ref: MC/LCH/BRIS |
| | Scale: NTS | | Job No: 44382624 |
| | Drg. Size: A3 | FIGURE 3 | |

Title: CLIFF SEEPAGE SURVEY - 20 APRIL 2006 - VIEWPOINT 1 (SECTION A)
Location: BP OIL REFINERY, LLANDARCY - AREA 1
Client: BP OIL REFINERY, LLANDARCY

URS would note that the demolition of the potentially-contaminative infrastructure believed to be the most likely source for the hydrocarbon seepage on the cliff-face occurred in the mid-late 1980s, ie, approximately a decade before the observations made in 1998, and approximately two decades before the most recent inspection programme. On the basis of the available information, the degree of

URS

hydrocarbon seepage appears to be abating, and it seems that under the current conditions, the possibility for 'unpleasant' hydrocarbon-contaminated seepages to worsen from that observed recently is unlikely.

**Conclusions**

A 'watching brief' programme has been undertaken over the last 18 months on seepages occurring from the walls of the former quarry at the north end of Area 1, at the Llandarcy Refinery. In combination with anecdotal and investigative data, URS can provide the following general conclusions:

- Seepages occur from fracture zones principally in the west of the cliff-face, one bedding-plane fracture in particular near the top of the cliff-face appears to act as a significant drainage zone. Little or no seepage is identified along most of the central and eastern part of the cliff-face
- The structural make up of the rock tends to promote flow to the north, consistent with the orientation of the bedding planes, which dip at approximately 20 degrees to the north
- Available information suggests that potential contamination sources exist to the west of the quarry, and associated with former refining activities, and that groundwater sampling data supports this. Potential sources of contamination along the remainder of the 'promontory' are less-plausible
- Faint, barely perceptible, hydrocarbon odours were noted in one point of discharge along the west of the quarry. Sheens were also reported, however, it is believed that these are not hydrocarbon, as they are formed from platy precipitates, and are odourless.
- Anecdotal information, from 1998, suggests that the hydrocarbon discharge was significantly worse, and that free-phase hydrocarbon sheens were present at this time. Demolition of the infrastructure most likely to be responsible for the hydrocarbon in this area is believed to have occurred in the late 1980s, at least a decade prior to the 1998 observations. Anecdotally, the trend appears to the one of continuing improvement over the years
- On this basis, under the current conditions, URS believes that the seepage of hydrocarbon is likely to continue to decrease due to the continuing dissipation and degradation of free-phase hydrocarbon within the bedrock, which could provide a source of seepage.

It is noted that the forthcoming Coed Darcy development is likely to alter groundwater recharge at the site and thus potentially affect both ground water elevation and flow. It is possible that presently immobile residual hydrocarbon in fractures in the rock could become mobilised as a result of changes in the groundwater regime. Given the passage of time since operational sources were, however, removed, it is not thought likely that significant seepage from Area 1 will be prompted by development above and behind the cliff at current ground elevations.

URS trusts that this correspondence meets your requirements, however, should you have any questions or comments, please do not hesitate to contact the undersigned.

Yours faithfully
**URS Corporation Ltd**



Steve Coates
Project Director

# Appendix D - Former Solvent Pit Remediation Works Summary Report

# Remedial Works Programme - Former Solvent Pit Area

## Status Report - August 2007

30 August 2007
Draft

Issue No
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## EXECUTIVE SUMMARY

A programme of remedial works is currently underway in the vicinity of the former solvent pit at the BP Llandarcy Refinery site. The objective of this programme of remedial works is to reduce the residual solvent mass present within the former area of the solvent pit.

The programme of works commenced in April 2007 and has been ongoing since that time. It was intended that the system be operated for a minimum initial period of two months, with the decision to shut down the system to be based upon ongoing mass recovery rates and associated cost benefit assessment. This summary report presents a review and discussion of the monitoring data obtained to date.

Mass recovery from the system has been at a low rate, despite optimisation trials being undertaken. On this basis, a programme of closeout monitoring has been recommended.

# 1. INTRODUCTION

## 1.1. General

A programme of remedial works is underway in the vicinity of the former solvent pit at the BP Llandarcy Refinery site. The objective of this programme of remedial works is to reduce the residual solvent mass present within the former area of the solvent pit.

The programme of works commenced in April 2007 and has been ongoing since that time. It was intended that the system be operated for a minimum initial period of two months, with the decision to shut down the system to be based upon ongoing mass recovery rates and associated cost benefit assessment. This summary report presents a review and discussion of the monitoring data obtained to date and Recommendations for completion of the programme.

The system has been designed, installed and operated by Churngold Remediation Limited (CRL), based on a performance specification prepared by URS, as set out in document reference 'Remediation Performance Specification for Development Contract, reference 44382624, dated 27 July 2006. CRL submit a report to URS on a fortnightly basis summarising the works completed during the preceding period. URS undertakes additional monitoring activities to facilitate assessment of the ing the progression of the programme.

## 1.2. Background

Previous investigations at the site (2004) identified solvent contamination in the vicinity of the former solvent pit. The contaminants include TCE, with degradation products DCE and VC also present.

The subsurface geology in this area of the site comprises fractured Carboniferous sandstone. Resting groundwater levels within the area are approximately 3.0m below ground level.

As part of the development of the Area 1 remedial programme between BP and other stakeholders, it was agreed that some degree of source reduction should be undertaken within the area of the solvent pit. Whilst the potential risk to human health as a result of the contamination present was considered to be low, and no residential development was proposed in this area, BP agreed to undertake a programme of source reduction. Having determined this course of voluntary remediation, BP/URS approached the EA to inform them of the proposed works programme. At this time, the EA agreed with the assessment that there were no potential risks to Controlled Water. The EA also agreed that system performance monitoring be used as the means to determine a reasonable period of active works. Correspondance with the EA confirming this approach is reproduced in Appendix A.

As such, there is no specific performance target for the remedial programme currently underway, either in terms of mass recovery or achievement of groundwater concentrations.

## 1.3. Outline of Remedial System Installation

The remedial approach at the site involves the dewatering of the treatment area, with the aim of accessing or exposing residual solvent mass present within the normally saturated fracture system. A soil vapour extraction system is operated to recover solvent mass in the vapour phase from this fracture system. Groundwater abstraction and soil vapour extraction are undertaken using the same well installations.

The components of the system include:

- Recovery well network (RW1 – RW6). These wells are installed to approximately 15mbgl, screened in the interval 3 – 15mbgl.
- Monitoring well network (MW1 – MW6). These wells are installed to approximately 15mbgl, screened in the interval approximately 8 to 15mbgl
- Total fluids abstraction pumps installed within each of the recovery wells and associated discharge pipework system. The pump units are installed close to the base of the wells.
- Water treatment system comprising solids filtration, liquid phase activated carbon (primary/secondary vessels). Treated water is stored on site prior to disposal;
- Vacuum extraction system comprising vacuum pipework from each recovery well location to an inlet manifold, inlet moisture knock out vessel and vacuum pump system;
- Vapour treatment system comprising vapour phase carbon (primary/secondary vessels)

A process flow schematic is presented as Figure 1. The general layout of the system is illustrated on Figure 2.

# 2. SUMMARY OF OPERATION

The system was installed during the week ending 20th April. Operation commenced on 25th April.

Operation was continued with all six remediation wells in service through to 12 June, at which time URS undertook monitoring and adjustment/optimisation of system operation. At this time, the system was reset to operate on a limited number of wells. The operating wells were selected on the basis of solvent concentrations monitored within the individual wells. URS also implemented a comprehensive ongoing programme of monitoring at this time.

Based on information provided within the CRL summary reports, system operation has typically been greater than 80%. System shut down has occurred on account of several factors including high levels in the equipment bund areas and other automated shutdown sequences (including container temperature and pump inlet vacuum).

# 3. REVIEW AND DISCUSSION OF SYSTEM MONITORING DATA

## 3.1. Groundwater Quality Data

Groundwater samples have been obtained from the recovery wells (RW1 to RW6) periodically during the works programme and forwarded for laboratory VOC analysis. A summary of the analytical data is presented on Table 1. Samples are obtained from the pump discharge, and given the extremely low pumping/cycling rate, samples have not been collected from all well locations during each monitoring event.

The monitoring wells (MW1 to MW6) have also been sampled on one occasion (3 July 2007). Groundwater quality data is also available from the original investigation wells (WSB006, WSB007, WSB008, WSB009 and WSB0013). These wells were last sampled in 2004. This data is also summarised on Table 1.

A comparison of the concentrations in the wells installed as part of the 2004 investigation with the wells installed as part of the current remedial programme has been undertaken. Considering specifically the areas immediately surrounding the location of the former solvent pit, the observed concentrations within the recovery wells generally appear to be lower. This may reflect a number of factors including the heterogeneity of the fracture system. Furthermore the recovery wells may not have been developed fully prior to operation of the abstraction pumps. It is noted that the concentrations obtained during the 2004 investigation do not vary significantly across the depth range of the investigation. On this basis, it is not considered that the differences observed in concentration between the 2004 and recent series of wells, is a function of the different wells constructions (depths). It was agreed with the EA that the wells installed for the purposes of the remediation system would be used as part of the monitoring of the progression of the works, as the original investigative wells were outside if the proposed remediation area, and would be more indiciative of system performance.

Using DCE concentrations as the indicator, the data presented on Table 1 illustrates that whilst the concentration starting point for the recovery wells appears to be lower than the 2004 investigation wells, a decreasing or stable, concentration has generally been observed during the course of the remedial works programme.

The groundwater results are also presented in Figures 1 and 2.

## 3.2. System Operating Data

*Groundwater Levels*

Groundwater levels in the monitoring wells are presented on Table 2. On the basis that these measurements are obtained in the monitoring wells spaced between the abstraction points, it is inferred that a water level depression of 5 - 10m is currently being achieved across the treatment area. Whilst the groundwater level observed at MW3 is consistently higher than other locations and potentially not within the screened interval, the observed level is significantly below that observed under resting conditions.

*Abstracted Water Volumes*

The average total rate of groundwater abstraction is approximately 1.5m3/day. This is based upon readings obtained from a flow meter installed on the discharge from the carbon treatment units (Table 3). This low rate of groundwater abstraction corresponds with the observed low pump cycle rate of typically greater than 60 seconds, and in some instances several minutes. The auto pumps installed will cycle on a frequency determined by the depth of installation liquid head above the intake. A low cycle rate is indicative of a water level within the well at or close to the level of the intake, and the rate of inflow to the well is low.

*Applied and Induced Vacuum Conditions*

During the period of system operation June – July, the vacuum conditions at the inlet to the knock out vessel have been controlled typically in the range 300 – 500mbarg. This has resulted in vacuum conditions at the operating wellheads typically in the range 150 – 300mbarg.

Vacuum monitoring has been undertaken at the location of the monitoring points in order to assess the extent of any vacuum influence observed. This data is summarised on Table 4. Whilst the data is not conclusive, low vacuum levels (typically 0 –10mbar) have been periodically observed at several of these locations. .

*Extracted vapour concentrations*

Solvent concentrations in the combined vapour stream are monitored at the point of discharge from the vacuum pump unit, prior to the vapour phase carbon treatment vessel. Concentrations are monitored using a PID (10.6eV lamp). The results obtained are presented on Table 5. A significant variation in the readings has been observed, with no definite trend evident. An increased concentration was observed after the optimisation procedure undertaken on 12 June, however this does not appear to have been sustained. The majority of the readings are low (<50ppm) and are therefore at the lower end of the effective detection range of the instrument. The elevated reading obtained on 9 July is considered unlikely, and has been discounted in the preparation of mass recovery estimates (see below).

Vapour samples have periodically been obtained from the combined vapour stream prior to the vapour phase carbon for laboratory analysis using a Gresham tube technique. The laboratory has reported all VOC concentrations to be below the detection of 10ppm. This further confirms that VOC concentrations in the extracted vapour stream are low.

(Monitoring of the vapour discharge to atmosphere and between the carbon vessels is also undertaken by CRL to confirm the efficacy of the treatment process).

Monitoring of vapour concentrations within individual wells has periodically been undertaken in order to optimise the selection of operating wells. Recent data also suggests that ongoing concentrations are low.

## 3.3. Mass Recovery Estimates

The contamination mass recovered in the dissolved phase is a function of the low abstraction rate and the groundwater concentrations. Given the low abstraction rate (average of approximately 1.5$m^3$/day) and assuming the total VOC mass in the abstracted stream of less than 5mg/l (based upon the results presented in Table 1 and CRL sample analysis of the combined abstracted stream), the rate of mass recovery in the dissolved phase is extremely low (less than 10g/day).

An estimate of mass recovery in the vapour phase has been developed based upon the extracted vapour concentrations and the vapour flow rate. The vapour flow rate has been determined at 300m3/hr, based upon the pump performance characteristics provided by the equipment suppliers. Table 5 presents the estimate of vapour phase mass recovery. An estimated total VOC mass of 33kg has been recovered in the vapour phase during the period of operation April 25 to August 20. This equates to a recovery rate in the range 0.3 – 0.5kg/day. Concentrations of less than 10ppm in the combined vapour stream (as have been regularly observed) equate to an ongoing mass recovery of less than 0.1kg/day.

# 4. OPERATION FROM 27 JULY TO 20 AUGUST

URS attended site on 14th August to undertake optimisation trials on the system, which were intended to confirm that significant enhancement of recovery rates could not be achieved through variation of operating conditions.

A full monitoring round, including the collection of Groundwater samples from all Remedial and Monitoring wells for laboratory analysis was undertaken.

A programme of optimisation trials, including operating individual and multiple wells at varying vacuum copnditions was undertaken, and a marginal mass recovery rate increase (an increase in PID readings from 0.6 to 4.8) was achieved.

Based upon the optimisation trials undertaken by URS, it is not envisaged that sustained enhanced mass recovery rates can be achieved with the current system configuration.

# 5. CONCLUSIONS AND RECOMMENDATIONS

Whilst groundwater concentrations within the recovery wells appear to be declining or stable, the ongoing rate of VOC mass recovery is estimated to be low (likely ~0.1kg/day). On this basis, the continued operation of the system for a further undefined period is not considered to be justifiable from a technical or economic standpoint.

The following recommendations are therefore presented:

- Cease operation of the system for a period of one week, to allow groundwater conditions to equilibrate, and undertake a full monitoring round at the end of the period.
- Recommence operation of the system following the monitoring round for a further period of two weeks.
- Approach the EA and stakeholders to cease operation of the system presenting the completed data set, following receipt of recent monitoring data and associated interpretation;
- Obtain groundwater samples from recovery and monitoring wells after the completion of the further two week period. This programme of groundwater monitoring should be viewed as 'close out' monitoring, and is intended to demonstrate the conditions at the time of shutdown of the system. Note that it is not proposed to enter into a programme of groundwater concentration rebound assessment.

# Appendix A - Environment Agency Correspondance

URS

44382626/7832/MC

20th July 2006

Mr Neil Herbert
Environment Agency Wales
Maes Newydd
Llandarcy
Neath
West Glamorgan SA10 6HQ

Ms Andrea Mann
Environment Agency Wales
Groundwater and Contaminated Land Team
Ty Cambria
29 Newport Rd
Cardiff CF240TP

Dear Neil/Andrea

**Natural Attenuation Assessment**
**Former Solvent Degreasing Pit**
**Area 1, BP Llandarcy Refinery**

As you are aware, ahead of the redevelopment for Area 1 at the BP Llandarcy Refinery, we discussed (at your Cardiff offices) on March 15th this year, proposed voluntary remedial work of a limited-area chlorinated solvent plume believed associated with a former degreasing pit situated in the workshops and stores building. This building has now been demolished to ground level.

At the meeting, we discussed that groundwater sample results from boreholes adjacent to the nearest potential surface water receptor were below detection limits for the analysis (ie, demonstrating neither contamination of nor theoretical risk to controlled waters), but that BP anyway wished to undertake a limited programme of source-reduction in the vicinity of the former pit, to satisfy its internal objectives ahead of the long-term redevelopment of the site.

You will recall that sampling data demonstrated the area of the plume to be limited to a small area beneath and immediately downgradient of the degreasing pit. The primary data supporting ongoing progressive dechlorination of the parent solvent (through the presence of daughter products, and ultimately groundwater with no chlorinated compounds in the peripheral wells) was provided to the Environment Agency (EA) in previous correspondence.

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In the correspondence that followed our meeting, it was agreed with the EA that a long-term groundwater monitoring programme would yield neither system performance data, nor useful information on cleanup of the groundwater within the plume. The EA agreed that the primary evidence suggested that the solvent was being degraded, however, noted that secondary evidence supporting the presence of the necessary chemical and environmental conditions to facilitate degradation of the solvent, including conditions conducive to the breakdown of vinyl chloride, had not been assessed. It was agreed that a one-time demonstration of this would be necessary for the support of EA ahead of BP undertaking the source-reduction work.

BP requested that URS undertake the necessary scope of work to satisfy this requirement. This consisted of dipping and collection of analytical samples from serviceable wells within the plume (certain wells had been rendered unusable during the recent demolition of the workshops) for volatile organic compounds and a suite of parameters key to natural attenuation to occur, such as key anions, available organic carbon, alkalinity, etc., and field measured parameters such as temperature, electrical conductivity, dissolved oxygen, pH, and redox potential. As conditions at individual wells allowed, sample collection was undertaken in the last week of May and first week of June 2006. Tabulated results of these laboratory analyses are attached in Tables 1 and 2.

A statistical assessment of the chemical relationships was then undertaken as a means of showing that the natural degradation of chlorinated solvents inferred in the primary indicator data (ie, the actual VOC results) was supported by the secondary indicator data. This assessment is provided as Attachment A.

The key findings of the assessment were as follows:

- The 1,2-dichloroethene isomer detected ('cis-', rather than 'trans-'), demonstrates that the dichloroethene in groundwater is likely to be formed from degradation of TCE and is unlikely to be manufactured material, which is typically more than 80% composed of the 'trans-' isomer;
- Assessment of the physico-chemical conditions within the plume demonstrate that conditions are conducive for natural attenuation of the key species to occur;
- There is strong evidence, supported by statistically significant correlations between key contaminant species, reactive compounds and key reaction products, that natural attenuation of chlorinated ethenes within the plume is clearly ongoing within the plume, and;
- Conditions within the fringes of the plume are highly likely to support the degradation of vinyl chloride into simpler compounds (which is consistent with the absence of VC noted in peripheral and downgradient wells), although the breakdown products of this reaction could not be quantified by the laboratory.

URS and BP believe that the conclusions of this assessment meet the requirements agreed with EA; that no further assessment work is required, and; that the source-reduction works can now proceed. On the basis of our correspondence outlining the proposed remedial strategy (dated 16th January 2006), and 19th April 2006 (ref: 44382440\7815\MC), operation will continue until asymptotic levels are noted at the recovery system. As was agreed, no post-operational monitoring of groundwater will be undertaken after the period of system operation. We look forward to your positive response in this matter.

We would note that preparatory activities for the development will result in demolition of the boreholes used in this study, and that steps will be taken to abandon these boreholes appropriately ahead of these operations to minimise the potential for the pipework to remain as a potential pathway between the surface and groundwater.

Should you have any comments or questions, please do not hesitate to contact the undersigned.

Yours sincerely
**For URS Corporation Ltd**

Martin Chapple
Project Technical Director

Attachment: Attachment A: Evidence for Natural Attenuation of a TCE Plume, Former Solvent Degreasing Pit Area, BP Llandarcy Refinery

cc Geoff Byrne, BP Llandarcy Refinery
John Smith, BP Llandarcy Refinery
David Pollok, URS
Steve Coates, URS

creu lle gwell
creating a better place




Asiantaeth yr Amgylchedd Cymru
Environment Agency Wales

Martin Chapple
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Company House
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Tower Hill
Bristol BS2 0EQ

**Ein cyf/Our ref:** GW/Contland/SW/3BPLlandarcy

**Eich cyf/Your ref:**

**Dyddiad/Date:** 2 August 2006

Dear Martin

**Natural Attenuation Assessment - Former Solvent Degreasing Pit, Area 1 BP Llandarcy**

Thank you for your letter of 20 July to Neil Herbert and myself regarding the above.

The Environment Agency accepts the evidence provided regarding the mechanisms for on-going degradation of the chlorinated hydrocarbons in this location and the limited extent of the plume.

It is acknowledged, with regard to the risk assessment approach, that the primary goal of the proposed source reduction work is to reduce residual organic phase (free phase) mass from the fracture system in the 'capillary' zone rather than directly targetting current dissolved phase concentrations in the groundwater. Whilst this will have long-term benefits to groundwater quality beneath the site in terms of source removal, the performance of the scheme will be assessed through monitoring the abstracted water and vapour quality at the recovery system to estimate mass removal.

Consequently it is agreed that in accordance with the approach discussed at our meeting of 15 March and set out in your letter of 19th April, no additional groundwater monitoring is required as part of this voluntary remedial action. (This is without prejudice to any existing requirements that may have been agreed separately through the Mobile Plant Licensing). It is understood that monitoring of sample locations in the Llandarcy Bog (downgradient of this area) will in any case continue as part of the existing site-wide monitoring programme.

We would be grateful for an update on the performance of the recovery system in

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due course.

Yours sincerely

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**Table 1 - Groundwater Analytical results, Former Solvent Degreasing Pit**

| Location | ALKALINITY | CHLORIDE | TOTAL_ORGANIC_CARBON | NITRATE AS N | Iron (2+) | SULPHATE | SULPHIDE | Iron (3+) | Manganese | 1,1,1,Trichloroethane | BENZENE | Cis-1,2-Dichloroethene | Trichloroethene | Vinyl Chloride | Trans-1,2-dichloroethene | Toluene |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MSMW060 | 131000 | 21000 | 7400 | ND | ND | 15000 | 30 | ND | 3550 | ND | ND | ND | ND | ND | ND | ND |
| MSMW206 | 88500 | 8000 | 2300 | 400 | ND | 28000 | 40 | ND | 94 | ND | ND | 2.3 | ND | ND | ND | ND |
| P1BH015 | 50500 | 14000 | 1100 | 3500 | ND | 83000 | 30 | ND | 13 | ND | ND | ND | ND | ND | ND | ND |
| WSB002D2 | 87000 | 16000 | 10300 | NS | NS | NS | NS | NS | NS | ND | ND | ND | ND | ND | ND | ND |
| WSB002D3 | 561000 | 29000 | 12900 | NS | NS | NS | NS | NS | NS | ND | ND | ND | ND | ND | ND | ND |
| WSB003D1 | 190000 | 23000 | 14200 | NS | NS | NS | NS | NS | NS | 22.3 | ND | 9.3 | ND | ND | 1.4 | ND |
| WSB003D2 | 171000 | 28000 | 14600 | NS | NS | NS | NS | NS | NS | 10.8 | ND | 5.9 | ND | ND | ND | ND |
| WSB003D3 | 329000 | 54000 | 11500 | NS | NS | NS | NS | NS | NS | 2.4 | ND | ND | ND | ND | ND | ND |
| WSB004D2 | 92800 | 11000 | 3900 | 4200 | ND | 392000 | 30 | ND | 292 | 1.6 | ND | ND | ND | ND | ND | ND |
| WSB004D3 | 531000 | 57000 | 9300 | 1000 | ND | 279000 | 40 | ND | 256 | ND | ND | ND | ND | ND | ND | 1.1 |
| WSB005D1 | 280000 | 66000 | 15100 | 1500 | 710 | 1130000 | 20 | ND | 864 | 52.3 | ND | ND | ND | ND | ND | ND |
| WSB006D1 | 202000 | 114000 | 17200 | 500 | 2890 | 564000 | 30 | 570 | 829 | 192 | ND | 4760 | 23.8 | 913 | 121 | ND |
| WSB006D2 | 237000 | 56000 | 12100 | 500 | 3220 | 267000 | 30 | 1470 | 616 | 91 | ND | 8280 | ND | 952 | 116 | ND |
| WSB007D1 | 137000 | 19000 | 9400 | 3600 | ND | 215000 | 30 | ND | 60 | 50.4 | ND | 437 | 896 | 6 | 15.5 | ND |
| WSB007D2 | 151000 | 23000 | 10000 | 3300 | ND | 230000 | 30 | ND | 155 | 88.9 | ND | 3810 | 1580 | 128 | 41.4 | ND |
| WSB007D3 | 365000 | 42000 | 15600 | 900 | 1810 | 332000 | 30 | ND | 1700 | 40.7 | ND | 5470 | 3820 | 93 | 40.5 | ND |
| WSB008D2 | 214000 | 92000 | 16900 | ND | 4040 | 376000 | 40 | 1520 | 778 | 111 | ND | 43400 | 287 | 3190 | 279 | ND |
| WSB009D1 | NS | NS | NS | NS | NS | NS | NS | NS | NS | ND | ND | 406 | 6.8 | 65.8 | 8.7 | ND |
| WSB009D3 | 324000 | 46000 | 7100 | ND | ND | 105000 | 30 | ND | 290 | ND | ND | 146 | ND | 131 | 1.1 | ND |
| WSB010D | 194000 | 29000 | 5700 | NS | NS | NS | NS | NS | NS | ND | ND | 2.4 | ND | ND | ND | 1.3 |
| WSB013d1 | 374000 | 43000 | 12000 | 300 | -1 | 384000 | 30 | ND | 887 | ND | ND | 210 | ND | 514 | 8.6 | ND |
| WSB013d2 | 1150000 | 21000 | 9800 | -1 | 1660 | 393000 | 30 | 2660 | 2250 | ND | ND | 10 | ND | ND | ND | ND |

Notes: ND = result below the detection limit
NS = insufficient sample volume for the analysis, due to low recharge of the borehole
Concentrations in ug/l

**Table 2 - Dipping and Wellhead Parameter Results Summary**

| Location | Date | DTW | TD | Conductivity | DO | pH | Temp | Redox |
|---|---|---|---|---|---|---|---|---|
| MSMW060 | 22/05/2006 | 2.23 | 7.63 | 465 | 6.76 | 6.26 | 12.6 | 16.6 |
| WSB009D3 | 23/05/2006 | 5.308 | 15.78 | 661 | 5.3 | 7.72 | 12.4 | -65.7 |
| WSB009D2 | 22/05/2006 | 3.53 | 11.75 | 399 | NS | 8.06 | 12.6 | -188.5 |
| WSB009D1 | 22/05/2006 | 2.019 | 5.58 | 920 | 10.94 | 8.36 | 12.48 | 133.7 |
| WSB007D1 | 22/05/2006 | 1.088 | 5.8 | 825 | 6.92 | 6.77 | 13.05 | -49.3 |
| WSB007D2 | 22/05/2006 | 1.27 | 10.8 | 844 | 4.46 | 7.41 | 12.48 | -45.4 |
| WSB007D3 | 22/05/2006 | 0.807 | 15.25 | 863 | 5.12 | 7.55 | 13.01 | -52.4 |
| WSB003D1 | 22/05/2006 | 0.496 | 5.8 | 1364 | 11.6 | 8.01 | 12.13 | -71.3 |
| WSB003D2 | 22/05/2006 | 1.978 | 10.92 | 1451 | 5.27 | 7.74 | 12.9 | -61.2 |
| WSB003D3 | 22/05/2006 | 2.061 | 15.65 | 1584 | NS | 7.55 | 13.66 | -54.2 |
| WSB010D | 23/05/2006 | 4.93 | 15.7 | 290 | 11.65 | 7.8 | 14.65 | -130 |
| PIBH015 | 23/05/2006 | 3.823 | 5.6 | 259 | 9.05 | 8.06 | 12.64 | 64.1 |
| WSB002D3 | 22/05/2006 | 11.65 | 15.95 | 470 | 4.9 | 7.5 | 13.5 | -181 |
| WSB002D2 | 22/05/2006 | 0.5 | 5.65 | 176 | 5.17 | 8.01 | 11.6 | -159 |
| WSB013D1 | 22/05/2006 | 3.42 | 5.82 | 316 | 2.01 | 5.66 | 8.05 | -201 |
| WSB013D2 | 22/05/2006 | 8.2 | 11.52 | 218 | 2.54 | 6.6 | 9 | -190 |
| WSB004D2 | 22/05/2006 | 4.3 | 10.8 | 590 | 2.86 | 7.51 | 11.4 | -112 |
| WSB004D3 | 22/05/2006 | 13.93 | 15.71 | 456 | 2.8 | 7.82 | 11.4 | -131 |
| WSB008D2 | 23/05/2006 | 0.9 | 8.5 | 1387 | 1.3 | 8.5 | 11.8 | -169.1 |
| MSMW206 | 23/05/2006 | 1.72 | 6.91 | 341 | 7.14 | 8.71 | 12.4 | -105 |
| WSB006D1 | 08/06/2006 | 1.24 | 4.73 | 1446 | 2.5 | 7.98 | 12.5 | -87.4 |
| WSB006D2 | 08/06/2006 | 2.27 | 9.67 | 1112 | 3.34 | 8.91 | 20 | -3.3 |
| WSB005D1 | 08/06/2006 | 0.95 | 6.12 | 2979 | 4.72 | 7.25 | 20.1 | 15.4 |
| WSB006D3 | 08/06/2006 | 14.1 | 15.12 | IR | IR | IR | IR | IR |

NS = Not reported
IR = Insufficient recovery for the measurement
DO in mg/l, EC in us/m, Temp in degrees C
DTW = depth to water in metres from casing top, TD = Total Depth

# ATTACHMENT A: EVIDENCE FOR NATURAL ATTENUATION OF A TCE PLUME, FORMER SOLVENT DEGREASING PIT AREA, BP LLANDARCY REFINERY

## 1 OVERVIEW OF NATURAL ATTENUATION OF CHLORINATED ORGANIC COMPOUNDS

Chlorinated organic compounds constitute the predominant organic contaminants of concern associated with the degreasing pit and may have arisen directly from their previous usage as compounds at the site, or in some cases as degradation or 'daughter' products.

They comprise predominantly chlorinated ethenes: primarily trichloroethene (TCE), *cis* 1,2-dichloroethene (*cis*-1,2-DCE), *trans* 1,2-dichloroethene (*trans*-1,2-DCE) and vinyl chloride (VC) together with relatively low concentrations of 1,1,1-trichloroethane (TCA).

For degradation of the chlorinated ethenes, halorespiration is likely to represent the most significant mechanism of biological natural attenuation, at least close to the source and immediately downgradient from it. Under this process, the chlorinated hydrocarbon serves as an electron acceptor through the biochemical process by which the microorganisms derive energy and growth. The process is one of reductive dehalogenation (or more specifically, reductive dechlorination) by which hydrogen atoms are substituted for chlorine.

Vinyl chloride, and to a lesser extent dichloroethene, in common with other lesser-chlorinated compounds may also be degraded as a result of other mechanisms, including oxidation (where they act as electron donors), and cometabolism. Oxidation will require either aerobic conditions or the presence of a suitable alternative electron acceptor (such as iron (III). Cometabolism will generally take place best under aerobic conditions, and will require another carbon source such as gaseous alkanes (e.g. methane) or toluene.

An assessment of natural attenuation of chlorinated organics within the groundwater plume identified down gradient of the former degreasing pit within Area 1, based on an interpretation of the environmental and geochemical parameters is presented below.

## 2 ASSESSMENT OF EVIDENCE FOR NATURAL ATTENUATION

### 2.1 Occurrence of degradation products

The degreasing process was reported to have used TCE as the principal degreasing solvent. Based on URS experience, the solvent used in such processes is typically not pure, and can contain lesser amounts of other solvents such as TCA, PCE, etc, but typically not DCE and VC. In addition, where DCE is manufactured, it is typically of the "trans" isomer. As a result, analysis of the proportions of the 2 isomers provides an indication of whether the DCE was a manufactured impurity or, if present in the "cis" isomer, more likely the result of degradation.

An assessment of the relative concentrations of the parent solvent (TCE) with its daughter products (DCE, VC) was undertaken as it provides a clear indication as to whether degradation is occurring in the subsurface.

Where there was evidence of contamination by chlorinated ethenes, the combined concentrations of the daughter degradation products (*cis*-DCE and VC) were significantly greater than the parent compound, TCE in all but one case. Apart from this one instance (WSB007D1, situated directly adjacent to the former pit) TCE accounted for less than 50% of the total chlorinated ethenes present at the sample locations as shown in Table 1 below.

**Table 1: Relative proportion of TCE and breakdown products in those wells where chlorinated ethenes were detected (ranked according to total chloroethene content). Note: Chloride content is also shown**

| Location | Chloride (mg/l) | Sum of chloro ethenes µg/l | Percentages of total chloroethenes | | | |
|---|---|---|---|---|---|---|
| | | | TCE | cis-1,2-DCE | trans-1,2-DCE | VC |
| WSB008D2 | 92 | 47156 | 1% | 92% | 1% | 7% |
| WSB007D3 | 42 | 9424 | 41% | 58% | 0% | 1% |
| WSB006D2 | 56 | 9348 | 0% | 89% | 1% | 10% |
| WSB006D1 | 114 | 5818 | 0% | 82% | 2% | 16% |
| WSB007D2 | 23 | 5559 | 28% | 69% | 1% | 2% |
| WSB007D1 | 19 | 1355 | 66% | 32% | 1% | 0% |
| WSB013d1 | 43 | 733 | 0% | 29% | 1% | 70% |
| WSB009D1 | * | 487 | 1% | 83% | 2% | 14% |
| WSB009D3 | 46 | 278 | 0% | 52% | 0% | 47% |
| WSB003D1 | 23 | 11 | 0% | 87% | 13% | 0% |
| WSB013d2 | 21 | 10 | 0% | 100% | 0% | 0% |
| WSB003D2 | 28 | 5.9 | 0% | 100% | 0% | 0% |
| WSB010D | 29 | 2.4 | 0% | 100% | 0% | 0% |
| MSMW206 | 8 | 2.3 | 0% | 100% | 0% | 0% |

* - Insufficient sample volume recovered to permit secondary parameter analysis

Note - for comparative purposes, groundwater from well P1BH015 which is upgradient and outside of the plume had a chloride content of 14mg/l.

The predominance of *cis*-DCE over its isomer *trans*-DCE provides direct evidence of biological degradation by reductive dehalogenation. The *cis* isomer normally accounts for less than 20% of manufactured DCE, whereas within the groundwater plume is described the *trans* DCE isomer accounts for less than 4% of the total chloroethenes and a maximum of 15%.

## 2.2 Organic carbon

A source of organic carbon is required to drive the process of reductive dehalogenation through provision of hydrogen as the electron donor. The organic carbon can be natural or anthropogenic in origin. TOC concentrations in groundwater for wells where chlorinated ethenes were present as indicated in Table 1 ranged from 2.3 to 17.2mg/l, averaging around 10mg/l. Wiedemeier et al. 1999[1] have indicated that TOC concentrations of 20mg/l and above are optimal for reductive dechlorination. Whilst the concentrations of organic carbon present may be sub-optimal, it is considered that sufficient is present to make a significant contribution to the reductive process.

Both of the TCE degradation products, DCE and VC were positively correlated with TOC ($r = 0.605$ and 0.587 respectively; $P<0.05$). Whilst TOC was also correlated with TCE, the correlation was significant only upon log transformation of the latter ($r = 0.639$; $P<0.05$) and was weaker than the correlations between log transformed data for both DCE ($r = 0.743$; $P<0.01$) and also VC ($r = 0.729$; $P<0.01$). This positive association between the higher concentrations of organic carbon and the degradation products of TCE therefore provides supportive evidence for reductive dechlorination being facilitated in areas where sufficient carbonaceous material was present to generate hydrogen through anaerobic decomposition.

It is evident that the organic carbon present has enhanced microbial activity through increased carbon dioxide production. This is demonstrated by the significant positive correlation between TOC and alkalinity ($r=0.695$; $P<0.02$ on log transformation of variates). The extent to which the degradation of organic carbon has lowered redox conditions sufficiently to enable reductive dechlorination to take place can also be assessed through an examination of TOC concentrations in relation to those of oxygen, nitrate, sulphate, iron (II), manganese (II) and methane These serve as electron acceptors or in the case of the latter three, reaction products formed as a result of microbial degradation of carbonaceous materials. The sequential loss of these electron acceptors or formation of the reaction products can therefore be used to assess how conducive conditions are for reductive dechlorination to take place. This will be discussed below.

## 2.3 Groundwater pH

Significant inhibition of reductive dehalogenation is unlikely to take place unless the pH is below 5 or greater than 9.The groundwater pH is mostly in the 6 to 8 range and considered optimal for microbial activity. Whilst there are a couple of instances where groundwater of greater than pH 8.5 has been recorded (MSMW206 at pH 8.71 and WSB006D2 at pH 8.91) the former is outside the area where reductive dehalogenation is likely to be most prevalent. Moreover, in both cases the predominance of *cis* DCE over the parent compound is evidence that reductive microbial activity has not been significantly inhibited. A similar argument can be presented for WSBO13d1 with a pH of 5.66.

## 2.4 Redox conditions and oxygen concentrations

[1] Wiedemeier, T.H., Rifai, H.S., Newell, C.J. & Wilson, J.T., (1999): Natural Attenuation of Fuels and Chlorinated Solvents in the Subsurface New York (John Wiley & Sons Inc).

Field measurements of redox and oxygen need to be viewed with caution as there is a potential for interferences and for underestimation of the degree of reducing conditions present (Wiedemeier et al., 1999)[1]. For reductive dechlorination to take place the redox potential should be below 50mV, which was the case for almost all of the samples taken. In several cases redox potentials were also below -100mV, considered to be optimal for reductive dechlorination, particularly in WSB013d1 and WSB013d 2.

Oxygen concentrations should also be below 0.5mg/l, which is not the case according to the field data: however potential interferences or ingress of atmospheric oxygen are likely to have raised the latter (The wells typically produced insufficient water to completely purge the flow-through cell in which the measurement is made). Whilst the actual values for oxygen reported in the field should therefore be viewed with caution it is considered that the relative concentrations are still useful for comparative purposes across the area of concern. This is supported by a statistically significant negative correlation between TOC and oxygen, which was strengthened through log transformation of the former ($r=-0.667$; $P<0.02$). This correlation is as expected, indicating that microbial degradation of available carbonaceous material has resulted in a depletion of oxygen.

Interestingly there were also general negative trends between both of the breakdown products of TCE and oxygen levels. This was reflected in significant negative correlations between both DCE ($r = -0.578$; $P<0.05$) and VC ($r = -0.673$; $P<0.01$) and (log-transformed) concentrations of oxygen.

Even if any VC that failed to be reduced to ethene or ethane under anaerobic conditions was present towards the fringes of the plume therefore, this would be readily degradable under the more aerobic conditions present in the downgradient areas of the plume, as recorded for example in MSMW060 (6.76mg/l oxygen, redox potential 16.6mV).

### 2.5 Nitrate

Nitrate will compete with the reductive pathway and concentrations of greater than 1mg/l are undesirable for reductive dehalogenation. Apart from well P1BH015 (with 3.5mg/l nitrate), which is located hydraulically upgradient of the solvent pit and where chlorinated compounds were not-detected, there were limited instances where nitrate exceeded 1mg/l.

Of these, the only well location where elevated nitrate may have a limited degree of inhibitory effect is in WSB007, close to the source, with 3.6 and 3.3mg/l in WSB007D1 and 2 respectively. This may be is demonstrated by the elevated ratios of TCE to DCE and VC in samples taken from this well compared to other locations (see Table 1). Nonetheless, whilst elevated nitrate indicates sub-optimal conditions at this location, other data demonstrate that reductive dehalogenation is still taking place.

Well WSB004D2 with 4.2mg/l nitrate is located downgradient of the source area where concentrations of chloroethenes are below detection limits, so the presence of elevated nitrate is also unlikely to be an issue here. Indeed, in this area, downgradient of the source the nitrate may actually serve as an electron acceptor to facilitate the degradation of VC through anaerobic oxidation.

## 2.6 Iron and manganese

Elevated concentrations of dissolved iron and manganese are indicative of reducing conditions as indicated by significant positive correlations with TOC (for iron (II), $r=0.703; P<0.02$ and for manganese, $r= 0.691; P<0.02$ following log transformation). As such these indicate that conditions are favourable for reductive dehalogenation.

Any concentrations of iron (II) above 1mg/l may be regarded as being favourable for reductive dehalogenation. Four of the five locations where iron (II) concentrations were in excess of 1 mg/l coincided with the four most elevated concentrations of chlorinated ethenes, as observed in WSB006D1 and WSB006D2, WSB007D3 and WSB008D2 (all >5mg/l). Concentrations of both degradation products, *cis*-DCE and VC were positively correlated with iron (II), ($r= 0.879$ and $r=0.829$ respectively, for each $P<0.001$), indicating the association between suitability for reductive dehalogenation and iron-reducing conditions.

## 2.7 Sulphate

There are insufficient data to demonstrate the occurrence of sulphate reduction taking place, as there appears to be a relatively high background concentration of sulphate typically in the range of several hundred mg/l. In fact there is actually a significant positive correlation between sulphate and TOC, a result which is not inconsistent with the findings of previous studies concerning petroleum hydrocarbons and sulphate in other areas of the Llandarcy site. The association of elevated sulphate indicates a potential source that is coincident with more elevated concentrations of organic carbon

Whilst high concentrations of sulphate may compete with the reductive pathway where sulphate concentrations are in excess of 20mg/l, reductive dechlorination commonly reported to occur in plumes with high sulphate concentrations (Wiedemeier et al., 1999) it is not considered that the presence of elevated sulphate in Area 1 is having a significantly inhibitory effect.

## 2.8 Methane, ethane and ethene

Whilst concentrations of dissolved methane were relatively low, ranging from 0.01 to 0.17 µg/l it should be noted that the laboratory data potentially underestimate actual concentrations of methane in situ given the limited ability to prevent loss on collection. Additionally, too high concentrations of methane may indicate that methanogenesis is competing with reductive dehalogenation for available hydrogen.

Both of the TCE degradation products DCE and VC were correlated with methane ($r= 0.991$ and $0.995$ respectively; $P<0.01$) providing supportive evidence that reductive dechlorination was taking place where conditions were sufficiently reducing to support methanogenesis.

Ethane and ethene represent the ultimate daughter products of reductive dehalogenation, ethene being formed from reduction of vinyl chloride and potentially being reduced further to ethane. In the present study neither of these compounds were detectable, however, due to their low solubilities however quantification is anyway difficult.

As discussed above, it is also likely that in the areas with higher redox potential downgradient of the plume degradation of VC will take place via an oxidative mechanism rather than by reductive dechlorination.

### 2.9 Chloride

The release of chloride through the process of reductive dehalogenation may be expected to result in an increase in concentration where elevated organochlorine compounds are present.

Good evidence of reductive dehalogenation is provided when the concentration of chloride within the plume is greater than twice that of background. Well P1BH015 is upgradient and therefore considered to be outside the zone of influence and thereby representative of 'background' conditions had a chloride content of14mg/l. As shown in Table 1, the inorganic chloride concentration in all but one of the wells with an organochlorine content in excess of 100 µg/l was greater than twice this background value.

There was a significant positive correlation between inorganic chloride and concentrations of total organochlorine compounds (chlorinated ethenes plus trichloroethane) within the plume ($r= 0.538$; $P<0.01$, which was increased slightly to 0.546 by log transforming both variates). In the area where chlorinated ethenes were present above detection limits (i.e. the wells identified in Table 1), the correlation between total chlorinated ethenes and chloride ($r= 0.685$) was also significant at $P<0.01$.

## 3 CONCLUSIONS

There are strong primary and secondary lines of evidence for natural attenuation of chlorinated ethenes taking place through anaerobic degradation within the plume.

This is most evident from the presence of the relatively high ratio of degradation products *cis*-DCE and VC to the parent compound (indicative that the DCE is a degradation product, rather than manufactured, and that degradation is considerably advanced), the rapid fall off in concentrations of these degradation products with distance from the source and their absence from any of the samples of groundwater directly downgradient from the plume. Additionally, elevated inorganic chloride formed as a result of organochlorine degradation is strongly correlated with total concentrations of the chlorinated organics present.

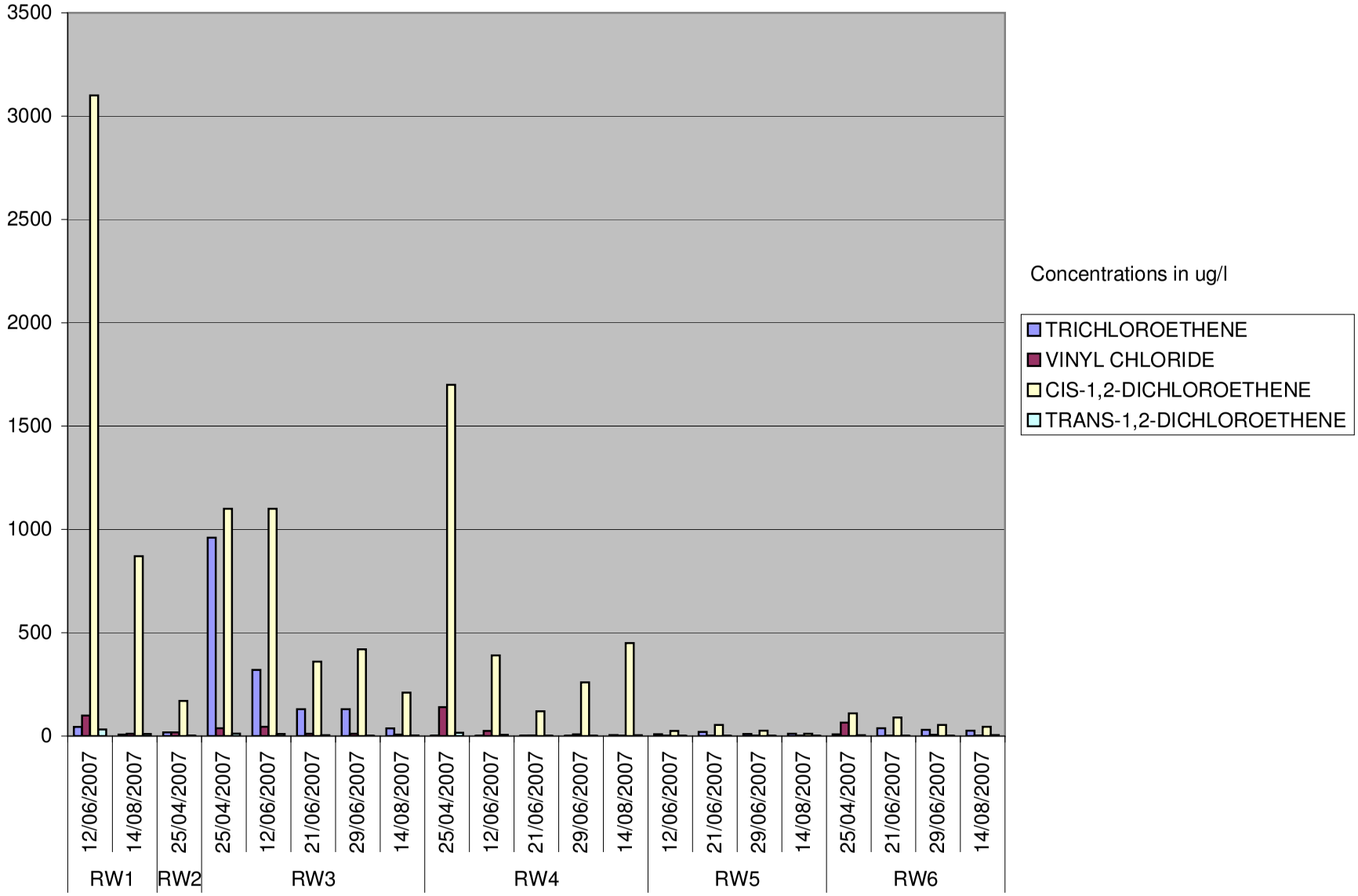
The chemical make-up of the plume groundwater is characterised by elevated concentrations of total organic carbon (of either natural or anthropogenic origin) which is providing a carbon source for microbial activity as indicated by the correlation between TOC and alkalinity (indicating increased carbon dioxide). Evidence that this has directly resulted in decreased redox conditions is provided by the occurrence of elevated iron and manganese in the presence of high concentrations of TOC, resulting in an environment within the source area and immediately downgradient from it that is highly conducive for reductive dehalogenation. This is further supported by an absence of nitrate in most of the source zone locations, and which might compete with the chlorinated organics as an alternative electron acceptor.

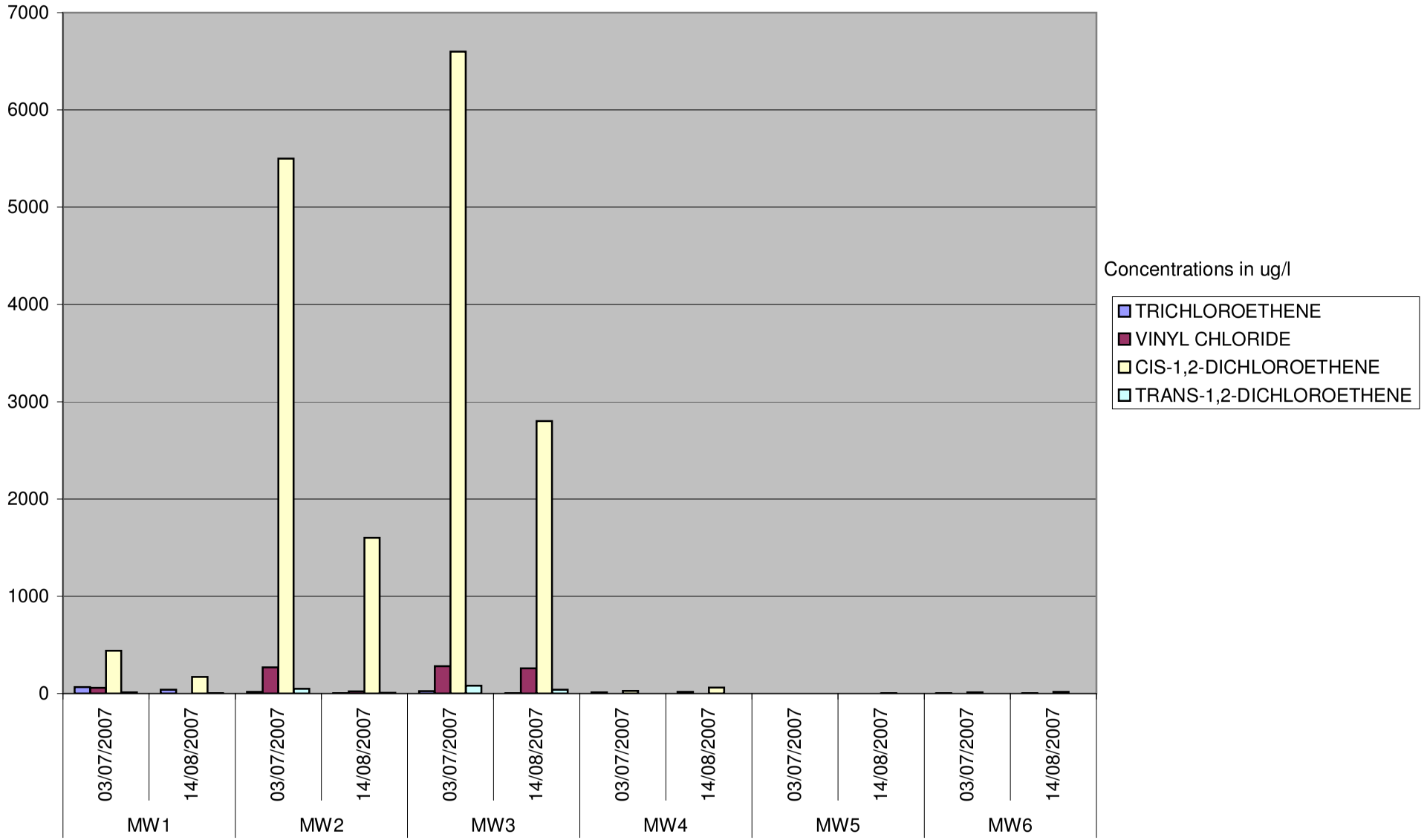
Reductive dechlorination of TCE to DCE and then VC has therefore been facilitated by such conditions within the core of the plume, so that further degradation of the VC to ethene and ethane, which are likely to be readily lost from groundwater, will also take place

Should complete removal of VC not occur directly by such mechanisms, conditions outside the source area, towards the fringes of the plume are suitable for degradation of residual VC (and potentially DCE) through the processes of aerobic or anaerobic oxidation. Through these processes (under which oxygen, nitrate or iron (III) for example act as electron acceptors), the VC is mineralised to carbon dioxide and chloride. The suitability of the groundwater for this is evident by the presence of elevated oxygen and/or nitrate within these areas.

In conclusion therefore, the findings from previous monitoring rounds that there is an absence of both TCE and its degradation products, DCE and VC in groundwater samples from wells adjacent to Llandarcy bog have now been supported by the secondary evidence of the natural attenuation having occurred.

# Figures


3500
3000
2500
2000
1500
1000
500
0
Concentrations in ug/l
TRICHLOROETHENE
VINYL CHLORIDE
CIS-1,2-DICHLOROETHENE
TRANS-1,2-DICHLOROETHENE
12/06/2007
14/08/2007
25/04/2007
25/04/2007
12/06/2007
21/06/2007
29/06/2007
14/08/2007
25/04/2007
12/06/2007
21/06/2007
29/06/2007
14/08/2007
12/06/2007
21/06/2007
29/06/2007
14/08/2007
25/04/2007
21/06/2007
29/06/2007
14/08/2007
RW1
RW2
RW3
RW4
RW5
RW6


7000
6000
5000
4000
3000
2000
1000
0
Concentrations in ug/l
TRICHLOROETHENE
VINYL CHLORIDE
CIS-1,2-DICHLOROETHENE
TRANS-1,2-DICHLOROETHENE
03/07/2007
14/08/2007
MW1
MW2
MW3
MW4
MW5
MW6

# Tables

# Table 1

| ***Recovery wells*** | Date | TRICHLOROETHENE | VINYL CHLORIDE | CIS-1,2-DICHLOROETHENE | TRANS-1,2-DICHLOROETHENE |
|---|---|---|---|---|---|
| RW1 | 12/06/2007 | 44 | 99 | 3100 | 32 |
| | 14/08/2007 | 7 | 11 | 870 | 10 |
| RW2 | 25/04/2007 | 18 | 18 | 170 | 2 |
| RW3 | 25/04/2007 | 960 | 38 | 1100 | 12 |
| | 12/06/2007 | 320 | 45 | 1100 | 10 |
| | 21/06/2007 | 130 | 11 | 360 | 4 |
| | 29/06/2007 | 130 | 11 | 420 | 1 |
| | 14/08/2007 | 37 | 7 | 210 | 3 |
| RW4 | 25/04/2007 | 2 | 140 | 1700 | 16 |
| | 12/06/2007 | 1 | 25 | 390 | 6 |
| | 21/06/2007 | 2 | 3 | 120 | 1 |
| | 29/06/2007 | 1 | 8 | 260 | 1 |
| | 14/08/2007 | 5 | 1 | 450 | 4 |
| RW5 | 12/06/2007 | 9 | 1 | 25 | 1 |
| | 21/06/2007 | 20 | 1 | 54 | 1 |
| | 29/06/2007 | 10 | 1 | 26 | 1 |
| | 14/08/2007 | 11 | 1 | 11 | 1 |
| RW6 | 25/04/2007 | 8 | 65 | 110 | 4 |
| | 21/06/2007 | 38 | 1 | 90 | 1 |
| | 29/06/2007 | 30 | 6 | 54 | 1 |
| | 14/08/2007 | 26 | 2 | 45 | 5 |

| ***Monitoring wells*** | date | TRICHLOROETHENE | VINYL CHLORIDE | CIS-1,2-DICHLOROETHENE | TRANS-1,2-DICHLOROETHENE |
|---|---|---|---|---|---|
| MW1 | 03/07/2007 | 65 | 59 | 440 | 12 |
| | 14/08/2007 | 39 | 1 | 170 | 2 |
| MW2 | 03/07/2007 | 16 | 270 | 5500 | 50 |
| | 14/08/2007 | 3 | 23 | 1600 | 8 |
| MW3 | 03/07/2007 | 24 | 280 | 6600 | 81 |
| | 14/08/2007 | 3 | 260 | 2800 | 38 |
| MW4 | 03/07/2007 | 12 | 1 | 28 | 1 |
| | 14/08/2007 | 16 | 1 | 62 | 1 |
| MW5 | 03/07/2007 | 1 | 1 | 1 | 1 |
| | 14/08/2007 | 1 | 1 | 2 | 1 |
| MW6 | 03/07/2007 | 3 | 1 | 12 | 1 |
| | 14/08/2007 | 2 | 1 | 16 | 1 |
| ***2004 Investigation wells*** | | | | | |
| WSB006D1 | 01/10/2004 | 47.5 | 2550 | 8500 | 203 |
| WSB006D2 | 01/10/2004 | 35 | 3320 | 16400 | 338 |
| WSB006D3 | 01/10/2004 | 1 | 229 | 1210 | 21.6 |
| WSB007D1 | 01/10/2004 | 3580 | 4670 | 27400 | 407 |
| WSB007D2 | 01/10/2004 | 5430 | 4240 | 27400 | 211 |
| WSB007d3 | 01/10/2004 | 3270 | 4870 | 21000 | 397 |
| WSB008D1 | 01/10/2004 | 87.6 | 1430 | 11900 | 181 |
| WSB008D2 | 01/10/2004 | 49.3 | 2290 | 10400 | 170 |
| WSB009D1 | 11/12/2004 | 1.5 | 32.1 | 270 | 3.4 |
| WSB009D2 | 11/12/2004 | 1.4 | 43.8 | 340 | 3.2 |
| WSB009D3 | 11/12/2004 | 1 | 225 | 600 | 14.1 |
| WSB013d1 | 11/12/2004 | 1 | 696 | 392 | 8.1 |
| WSB013d2 | 11/12/2004 | 1 | 414 | 213 | 2.6 |

***Notes:***
micrograms/litre
Samples dated 25/4/07 collected by CRL and analysed by CRL subcontract laboratories

Table 2

| Date | Well Number | Depth to water (mbtc) | Depth to Water (mbgl) |
|---|---|---|---|
| 12/06/2007 | MW1 | 9.330 | 8.240 |
| | MW2 | 7.220 | 6.115 |
| | MW3 | 5.085 | 4.035 |
| | MW4 | 11.780 | 10.730 |
| | MW5 | 11.055 | 10.030 |
| | MW6 | 12.693 | 12.445 |
| 18/06/2007 | MW1 | 9.402 | 8.354 |
| | MW2 | 7.070 | 5.985 |
| | MW3 | 5.822 | 4.787 |
| | MW4 | 10.519 | 9.473 |
| | MW5 | 10.847 | 9.816 |
| | MW6 | 10.651 | 10.401 |
| 20/06/2007 | MW1 | 9.540 | 9.540 |
| | MW2 | 7.289 | 7.289 |
| | MW3 | 5.845 | 5.845 |
| | MW4 | 10.502 | 10.502 |
| | MW5 | 11.053 | 11.053 |
| | MW6 | 12.153 | 12.153 |
| 21/06/2007 | MW1 | 9.543 | 9.54 |
| | MW2 | 7.311 | 7.31 |
| | MW3 | 5.383 | 5.38 |
| | MW4 | 10.477 | 10.48 |
| | MW5 | 10.902 | 10.90 |
| | MW6 | 10.617 | 10.62 |
| 25/06/2007 | MW1 | 9.513 | 9.513 |
| | MW2 | 6.500 | 6.500 |
| | MW3 | 5.158 | 5.158 |
| | MW4 | 10.496 | 10.496 |
| | MW5 | 9.023 | 9.023 |
| | MW6 | 9.537 | 9.537 |
| 29/06/2007 | MW1 | 9.572 | 9.572 |
| | MW2 | 6.869 | 6.869 |
| | MW3 | 5.428 | 5.428 |
| | MW4 | 10.627 | 10.627 |
| | MW5 | 9.642 | 9.642 |
| | MW6 | 11.396 | 11.396 |
| 02/07/2007 | MW1 | 9.553 | 9.553 |
| | MW2 | 6.346 | 6.346 |
| | MW3 | 2.612 | 2.612 |
| | MW4 | 8.802 | 8.802 |
| | MW5 | 8.369 | 8.369 |
| | MW6 | 7.429 | 7.429 |
| 03/07/2007 | MW1 | 9.572 | 9.572 |
| | MW2 | 6.393 | 6.393 |
| | MW3 | 5.595 | 5.595 |
| | MW4 | 10.657 | 10.657 |
| | MW5 | 8.808 | 8.808 |
| | MW6 | 10.097 | 10.097 |
| 06/07/2007 | MW1 | 14.567 | 14.567 |
| | MW2 | 14.763 | 14.763 |
| | MW3 | 5.990 | 5.990 |
| | MW4 | 11.837 | 11.837 |
| | MW5 | 14.180 | 14.180 |
| | MW6 | 12.274 | 12.274 |
| 09/07/2007 | MW1 | 14.488 | 14.488 |
| | MW2 | 14.382 | 14.382 |
| | MW3 | 5.158 | 5.158 |
| | MW4 | 10.622 | 10.622 |
| | MW5 | 12.559 | 12.559 |
| | MW6 | 10.394 | 10.394 |

| Date | Well Number | Depth to water (mbtc) | Depth to Water (mbgl) |
|---|---|---|---|
| 13/07/2007 | MW1 | 14.445 | 14.445 |
| | MW2 | 14.022 | 14.022 |
| | MW3 | 6.630 | 6.630 |
| | MW4 | 11.234 | 11.234 |
| | MW5 | 12.475 | 12.475 |
| | MW6 | 13.745 | 13.745 |
| 16/07/2007 | MW1 | 14.332 | 14.332 |
| | MW2 | 13.459 | 13.459 |
| | MW3 | 5.748 | 5.748 |
| | MW4 | 10.607 | 10.607 |
| | MW5 | 10.583 | 10.583 |
| | MW6 | 10.158 | 10.158 |
| 20/07/2007 | MW1 | 14.305 | 14.305 |
| | MW2 | 13.104 | 13.104 |
| | MW3 | 5.687 | 5.687 |
| | MW4 | 10.837 | 10.837 |
| | MW5 | 11.981 | 11.981 |
| | MW6 | 13.775 | 13.775 |
| 24/07/2007 | MW1 | 14.172 | 14.172 |
| | MW2 | 12.371 | 12.371 |
| | MW3 | 5.413 | 5.413 |
| | MW4 | 10.737 | 10.737 |
| | MW5 | 9.928 | 9.928 |
| | MW6 | 9.791 | 9.791 |
| 27/07/2007 | MW1 | 14.083 | 14.083 |
| | MW2 | 11.869 | 11.869 |
| | MW3 | 5.311 | 5.311 |
| | MW4 | 10.738 | 10.738 |
| | MW5 | 9.785 | 9.785 |
| | MW6 | 9.597 | 9.597 |
| 31/07/2007 | MW1 | 14.008 | 14.008 |
| | MW2 | 11.365 | 11.365 |
| | MW3 | 6.131 | 6.131 |
| | MW4 | 10.806 | 10.806 |
| | MW5 | 10.252 | 10.252 |
| | MW6 | 12.082 | 12.082 |
| 06/08/2007 | MW1 | 13.961 | 13.961 |
| | MW2 | 10.754 | 10.754 |
| | MW3 | 5.662 | 5.662 |
| | MW4 | 11.090 | 11.090 |
| | MW5 | 10.913 | 10.913 |
| | MW6 | 10.842 | 10.842 |
| 10/08/2007 | MW1 | 13.937 | 13.937 |
| | MW2 | 10.365 | 10.365 |
| | MW3 | 5.522 | 5.522 |
| | MW4 | 11.323 | 11.323 |
| | MW5 | 11.179 | 11.179 |
| | MW6 | 11.137 | 11.137 |
| 13/08/2007 | MW1 | 13.912 | 13.912 |
| | MW2 | 10.025 | 10.025 |
| | MW3 | 5.593 | 5.593 |
| | MW4 | 11.444 | 11.444 |
| | MW5 | 11.335 | 11.335 |
| | MW6 | 12.447 | 12.447 |
| 20/08/2007 | MW7 | 14.034 | 12.98 |
| | MW8 | 9.529 | 8.44 |
| | MW9 | 5.660 | 4.63 |
| | MW10 | 10.703 | 9.66 |
| | MW11 | 10.316 | 9.27 |
| | MW12 | 10.408 | 10.12 |

Table 3

| ***Date*** | ***Water meter*** | ***Days of operation*** | ***Daily abstraction rate*** |
|---|---|---|---|
| | m3 | days | m3/day |
| | | | |
| 12/06/2007 | 1640 | | |
| 18/06/2007 | 1646 | 6 | 1.0 |
| 19/06/2007 | 1646 | 1 | 0.4 |
| 21/06/2007 | 1650 | 2 | 1.8 |
| 25/06/2007 | 1652 | 4 | 0.5 |
| 29/06/2007 | 1659 | 4 | 1.8 |
| 02/07/2007 | 1659 | 3 | 0.0 |
| 03/07/2007 | 1663 | 1 | 4.0 |
| 06/07/2007 | 1670 | 3 | 2.3 |
| 09/07/2007 | 1673 | 3 | 1.0 |
| 13/07/2007 | 1680 | 4 | 1.8 |
| 16/07/2007 | 1682 | 3 | 0.7 |
| 20/07/2007 | 1692 | 4 | 2.5 |
| 24/07/2007 | 1693 | 4 | 0.3 |
| 27/07/2007 | 1696 | 3 | 1.0 |
| 31/07/2007 | 1702 | 4 | 1.5 |
| 02/08/2007 | 1705 | 2 | 1.5 |
| 06/08/2007 | 1709 | 4 | 1.0 |
| 10/08/2007 | 1712 | 4 | 0.8 |
| 13/08/2007 | 1712.5 | 3 | 0.2 |
| 14/08/2007 | 1713 | 1 | 0.5 |
| 20/08/2007 | 1718 | 6 | 0.8 |
| | | ***Average*** | *1.2* |

Table 4

| *Date* | *Vacuum at inlet to knock out vessel* |
|---|---|
| | bar |
| | |
| 12/06/2007 | -0.05 |
| 19/06/2007 | -0.375 |
| 21/06/2007 | -0.67 |
| 25/06/2007 | Jumping -0.25 to 0.3 |
| 29/06/2007 | 0.31 |
| 02/07/2007 | 0 |
| 03/07/2007 | -0.4 |
| 06/07/2007 | -0.4 |
| 09/07/2007 | -0.39 |
| 13/07/2007 | -0.45 |
| 16/07/2007 | Jumping -0.46 to -0.5 |
| 20/07/2007 | -6 |
| 24/07/2007 | -0.4 to -0.35 |
| 27/07/2007 | -0.25 to -0.3 |
| 31/07/2007 | -0.35 |
| 02/08/2007 | -0.37 |
| 06/08/2007 | -0.325 |
| 10/08/2007 | -0.2 |
| 13/08/2007 | -0.175 |
| 14/08/2007 am | -0.275 |
| 14/08/2007 pm | -0.6 |
| 20/08/2007 | -0.8 |

| Date | Well Number | Vacuum at Wellhead (mbar) |
|---|---|---|
| 12/6/07 AM | RW1 | 65 |
| | RW2 | 66 |
| | RW3 | 60 |
| | RW4 | 66 |
| | RW5 | 55 |
| | RW6 | 62 |
| 12/6/07 PM | RW1 | 165 |
| | RW2 | |
| | RW3 | 163 |
| | RW4 | 160 |
| | RW5 | |
| | RW6 | |
| 18/06/2007 | RW1 | -345.0 |
| | RW2 | 0.0 |
| | RW3 | -250.0 |
| | RW4 | -280.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 20/06/2007 | RW1 | -350.0 |
| | RW2 | 0.0 |
| | RW3 | -270.0 |
| | RW4 | -300.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 21/06/2007 | RW1 | 0.0 |
| | RW2 | 0.0 |
| | RW3 | -560.0 |
| | RW4 | -700.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 25/06/2007 | RW1 | -200.0 |
| | RW2 | -60.0 |
| | RW3 | -150.0 |
| | RW4 | -150.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 29/06/2007 | RW1 | -280.0 |
| | RW2 | 0.0 |
| | RW3 | -175.0 |
| | RW4 | -200.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 02/07/2007 | RW1 | 0.0 |
| | RW2 | 0.0 |
| | RW3 | 0.0 |
| | RW4 | 0.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 03/07/2007 | RW1 | -375.0 |
| | RW2 | -345.0 |
| | RW3 | -250.0 |
| | RW4 | -325.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 06/07/2007 | RW1 | -400.0 |
| | RW2 | -375.0 |
| | RW3 | -280.0 |
| | RW4 | -350.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 09/07/2007 | RW1 | -330.0 |
| | RW2 | -310.0 |
| | RW3 | -220.0 |
| | RW4 | -300.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 13/07/2007 | RW1 | -360.0 |
| | RW2 | -330.0 |
| | RW3 | -250.0 |
| | RW4 | -320.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |

| Date | Well Number | Vacuum at Wellhead (mbar) |
|---|---|---|
| 16/07/2007 | RW1 | -460.0 |
| | RW2 | -400.0 |
| | RW3 | -335.0 |
| | RW4 | -445.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 20/07/2007 | RW1 | -700.0 |
| | RW2 | -650.0 |
| | RW3 | -600.0 |
| | RW4 | -600.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 24/07/2007 | RW1 | -250.0 |
| | RW2 | -290.0 |
| | RW3 | -300.0 |
| | RW4 | -260.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 27/07/2007 | RW1 | -200.0 |
| | RW2 | 0.0 |
| | RW3 | -150.0 |
| | RW4 | -200.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 31/07/2007 | RW1 | -300.0 |
| | RW2 | 0.0 |
| | RW3 | -215.0 |
| | RW4 | -310.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 02/08/2007 | RW1 | -310.0 |
| | RW2 | 0.0 |
| | RW3 | -250.0 |
| | RW4 | -515.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 06/08/2007 | RW1 | -250.0 |
| | RW2 | 0.0 |
| | RW3 | -200.0 |
| | RW4 | -330.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 10/08/2007 | RW1 | -125.0 |
| | RW2 | 0.0 |
| | RW3 | -50.0 |
| | RW4 | -120.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 13/08/2007 | RW1 | -100.0 |
| | RW2 | 0.0 |
| | RW3 | -15.0 |
| | RW4 | -130.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 14/08/2007 am | RW1 | -200.0 |
| | RW2 | 0.0 |
| | RW3 | -100.0 |
| | RW4 | -180.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 14/08/2007 pm | RW1 | 0.0 |
| | RW2 | -550.0 |
| | RW3 | -510.0 |
| | RW4 | -600.0 |
| | RW5 | 0.0 |
| | RW6 | 0.0 |
| 15/08/2007 | RW1 | 0.00 |
| | RW2 | 0.00 |
| | RW3 | -630 |
| | RW4 | -700 |
| | RW5 | 0.00 |
| | RW6 | 0.00 |

| Date | Well Number | Vacuum Reading (mbar) |
|---|---|---|
| 12/06/2007 | MW1 | |
| | MW2 | |
| | MW3 | |
| | MW4 | |
| | MW5 | |
| | MW6 | |
| 18/06/2007 | MW1 | 9.20 |
| | MW2 | 3.60 |
| | MW3 | no bung in place, cap not fitted tightly |
| | MW4 | -0.20 |
| | MW5 | -3.50 |
| | MW6 | -10.10 |
| 20/06/2007 | MW1 | |
| | MW2 | |
| | MW3 | |
| | MW4 | |
| | MW5 | |
| | MW6 | |
| 21/06/2007 | MW1 | 0.10 |
| | MW2 | 2.28 |
| | MW3 | 0.45 |
| | MW4 | -0.10 |
| | MW5 | -1.25 |
| | MW6 | -2.70 |
| 25/06/2007 | MW1 | -0.05 |
| | MW2 | 8.65 |
| | MW3 | 24.10 |
| | MW4 | -3.00 |
| | MW5 | -4.47 |
| | MW6 | 22.80 |
| 29/06/2007 | MW1 | 0.00 |
| | MW2 | 9.11 |
| | MW3 | 0.40 |
| | MW4 | -0.21 |
| | MW5 | 4.00 |
| | MW6 | -7.25 |
| 02/07/2007 | MW1 | 0.00 |
| | MW2 | -7.42 |
| | MW3 | 6.95 |
| | MW4 | 5.70 |
| | MW5 | 0.21 |
| | MW6 | 6.85 |
| 03/07/2007 | MW1 | -2.30 |
| | MW2 | 2.88 |
| | MW3 | 6.14 |
| | MW4 | 1.09 |
| | MW5 | 0.00 |
| | MW6 | 6.13 |
| 06/07/2007 | MW1 | -0.11 |
| | MW2 | 0.00 |
| | MW3 | -1.02 |
| | MW4 | 9.36 |
| | MW5 | -0.52 |
| | MW6 | 1.39 |
| 09/07/2007 | MW1 | -0.11 |
| | MW2 | 0.00 |
| | MW3 | -1.02 |
| | MW4 | 9.36 |
| | MW5 | -0.52 |
| | MW6 | 1.39 |
| 13/07/2007 | MW1 | -0.63 |
| | MW2 | -2.31 |
| | MW3 | 0.67 |
| | MW4 | 2 - 25 |
| | MW5 | 0.80 |
| | MW6 | 4.39 |
| 16/07/2007 | MW1 | -0.32 |
| | MW2 | 1.35 |
| | MW3 | 6.60 |
| | MW4 | varied - out of range to -3.1 |
| | MW5 | 0.03 |
| | MW6 | 29.30 |

| Date | Well Number | Vacuum Reading (mbar) |
|---|---|---|
| 20/07/2007 | MW1 | -2.63 |
| | MW2 | -0.76 |
| | MW3 | -4.67 |
| | MW4 | 140.1 Varied out of range |
| | MW5 | 23.88 |
| | MW6 | 18.03 |
| 24/07/2007 | MW1 | Not taken |
| | MW2 | Not taken |
| | MW3 | Not taken |
| | MW4 | Not taken |
| | MW5 | Not taken |
| | MW6 | Not taken |
| 27/07/2007 | MW1 | Not taken |
| | MW2 | +0.08 |
| | MW3 | -2.09 |
| | MW4 | Not taken |
| | MW5 | Not taken |
| | MW6 | Not taken |
| 31/07/2007 | MW1 | 0.00 |
| | MW2 | -0.19 |
| | MW3 | -1.75 |
| | MW4 | 7.50 |
| | MW5 | 12.40 |
| | MW6 | -0.40 |
| 06/08/2007 | MW1 | -1.56 |
| | MW2 | -0.66 |
| | MW3 | 1.99 |
| | MW4 | |
| | MW5 | 0.58 |
| | MW6 | |
| 10/08/2007 | MW1 | 0.95 |
| | MW2 | 0.00 |
| | MW3 | -0.06 |
| | MW4 | 0.00 |
| | MW5 | -0.19 |
| | MW6 | 0.00 |
| 13/08/2007 | MW1 | 0.00 |
| | MW2 | -0.22 |
| | MW3 | 0.24 |
| | MW4 | 2.64 |
| | MW5 | -0.08 |
| | MW6 | 9.3 - 13.04 |
| 13/08/2007 | MW1 | -1.25 |
| | MW2 | -3.50 |
| | MW3 | -0.20 |
| | MW4 | 5.50 |
| | MW5 | -0.08 |
| | MW6 | 30.00 |

Table 5

| *Period* | *Hours of operation* | *Concentration at start of operating period* | *Concentration at end of operating period* | *Average concentration during period* | *PID correction factor* | *Corrected' average concentration during period* | *Average concentration* | *Pump inlet vacuum condition* | *Flowrate* | *Total mass recovery in vapour phase* | | *Total mass in period* | *Cumulative hours* | *Cumulative mass* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ppm | ppm | ppm | | ppm | mg/m3 | | Nm3/hr | mg/hr | g/hr | g | hrs | g |
| | | *(1) (2)* | | | *(3)* | | *(4)* | | *(5)* | | | | | |
| | | | | | | | | | | | | | | |
| 25/4 - 4/5 | 136 | 6.6 | 6.6 | 6.6 | 0.8 | 5.28 | 18 | 0.8 | 300 | 5442 | 5 | 740 | 136 | 740 |
| 4/5 - 18/5 | 336 | 8.9 | 6.8 | 7.85 | 0.8 | 6.28 | 22 | 0.8 | 300 | 6473 | 6 | 2175 | 472 | 2915 |
| 18/5 - 1/6 | 318 | 4.2 | 5.7 | 4.95 | 0.8 | 3.96 | 14 | 0.8 | 300 | 4081 | 4 | 1298 | 790 | 4213 |
| 1/6 - 12/6 | 216 | 5.7 | 6 | 5.85 | 0.8 | 4.68 | 16 | 0.8 | 300 | 4824 | 5 | 1042 | 1006 | 5255 |
| 12/6 - 18/6 | 93 | 26 | 7 | 16.5 | 0.8 | 13.2 | 45 | 0.8 | 300 | 13605 | 14 | 1265 | 1099 | 6520 |
| 18/6 - 21/6 | 96 | 7 | 50.6 | 28.8 | 0.8 | 23.04 | 79 | 0.8 | 300 | 23747 | 24 | 2280 | 1195 | 8800 |
| 21/6 - 25/6 | 96 | 50.6 | 97.2 | 73.9 | 0.8 | 59.12 | 203 | 0.8 | 300 | 60933 | 61 | 5850 | 1291 | 14649 |
| 25/6 -29/6 | 96 | 97.2 | 103 | 100.1 | 0.8 | 80.08 | 275 | 0.8 | 300 | 82536 | 83 | 7923 | 1387 | 22573 |
| 29/6 - 2/7 | 72 | 103 | 3.9 | 53.45 | 0.8 | 42.76 | 147 | 0.8 | 300 | 44072 | 44 | 3173 | 1459 | 25746 |
| 2/7 -3/7 | 24 | 3.9 | 10.4 | 7.15 | 0.8 | 5.72 | 20 | 0.8 | 300 | 5895 | 6 | 141 | 1483 | 25887 |
| 3/7 - 6/7 | 72 | 10.4 | 0.7 | 5.55 | 0.8 | 4.44 | 15 | 0.8 | 300 | 4576 | 5 | 329 | 1555 | 26217 |
| 6/7 - 9/7 | 72 | 0.7 | 4.6 | 2.65 | 0.8 | 2.12 | 7 | 0.8 | 300 | 2185 | 2 | 157 | 1627 | 26374 |
| 9/7 - 16/7 | 168 | 4.6 | 4.7 | 4.65 | 0.8 | 3.72 | 13 | 0.8 | 300 | 3834 | 4 | 644 | 1795 | 27018 |
| 16/7 - 20/7 | 96 | 4.7 | 42.2 | 23.45 | 0.8 | 18.76 | 64 | 0.8 | 300 | 19335 | 19 | 1856 | 1891 | 28875 |
| 20/7 - 24/7 | 96 | 42.2 | 20 | 31.1 | 0.8 | 24.88 | 85 | 0.8 | 300 | 25643 | 26 | 2462 | 1987 | 31336 |
| 24/07 - 27/7 | 72 | 20 | 2.5 | 11.25 | 0.8 | 9 | 31 | 0.8 | 300 | 9276 | 9 | 668 | 2059 | 32004 |
| 27/7 - 31/7 | 96 | 2.5 | 2.4 | 2.45 | 0.8 | 1.96 | 7 | 0.8 | 300 | 2020 | 2 | 194 | 2155 | 32198 |
| 31/7 - 2/8 | 48 | 2.4 | 1.7 | 2.05 | 0.8 | 1.64 | 6 | 0.8 | 300 | 1690 | 2 | 81 | 2203 | 32279 |
| *2/8 - 6/8* | *96* | *1.7* | *1.3* | *1.5* | 0.8 | 1.2 | 4 | 0.8 | 300 | 1237 | 1 | 119 | 2299 | 32398 |
| *6/8 - 10/8* | *96* | *1.3* | *2.2* | *1.75* | 0.8 | 1.4 | 5 | 0.8 | 300 | 1443 | 1 | 139 | 2395 | 32537 |
| *10/8 - 13/8* | *72* | *2.2* | *2.9* | *2.55* | 0.8 | 2.04 | 7 | 0.8 | 300 | 2103 | 2 | 151 | 2467 | 32688 |
| *13/8 - 14/8* | *24* | *2.9* | *0.6* | *1.75* | 0.8 | 1.4 | 5 | 0.8 | 300 | 1443 | 1 | 35 | 2491 | 32723 |
| *14/8 - 20/8* | 50 | 4.8 | 5.7 | 5.25 | 0.8 | 4.2 | 14 | 0.8 | 300 | 4329 | 4 | 216 | 2541 | 32939 |

**Total** 32.9 kg

*Notes*
*(1) CRL data has been used for period 25/4 to 12/6*
*(2) Recorded concentration of 416ppm appears high and value of 4.6 has been used*
*(3) Quoted response factor for DCE has been used, as this is dominat VOC*
*(4) Relative formula mass of 84 has been used, corresponding to DCE, as this is dominant VOC*
*(5) Using pump curve*

# Solvent Reduction Works
# Monitoring Results to 21 September 2007

| GAC | | | | | |
|---|---|---|---|---|---|
| **Date** | **inlet conc (ppm)** | **Int. pressure (bar)** | **1ry AQ GAC (bar)** | **2ry AQ GAC (bar)** | **Water meter (m3)** |
| 12/06/2007 | 6 | 0 | 0.5 | 0.4 | 1640 |
| 18/06/2007 | 60 | 0.5 | 0.4 | 0.3 | 1646 |
| 19/06/2007 | | | 0.4 | 0.3 | 1646 |
| 21/06/2007 | | 0.00 | 0.45 | 0.4 | 1650 |
| 25/06/2007 | | 0.00 | 0.4 | 0.35 | 1652 |
| 29/06/2007 | 103 | | 0.3 | 0.4 | 1659 |
| 02/07/2007 | 0 | 0 | 0 | 0 | 1659 |
| 03/07/2007 | | 0 | 0.3 | 0.2 | 1663 |
| 06/07/2007 | | 0 | 0.3 | 0.2 | 1670 |
| 09/07/2007 | | 0 | 0.3 | 0.2 | 1673 |
| 13/07/2007 | | 0 | 0.3 | 0.4 | 1680 |
| 16/07/2007 | | 0 | 0.25 | 0.3 | 1682 |
| 20/07/2007 | | 0 | 0.4 | 0.1 | 1692 |
| 24/07/2007 | | 0 | 0.15 | 0 | 1693 |
| 27/07/2007 | 2.5 | 0 | 0.25 | 0.35 | 1696 |
| 31/07/2007 | 2.4 | 0 | 0.25 | 0.4 | 1702 |
| 02/08/2007 | 1.7 | 0 | 0.2 | 0.35 | 1705 |
| 06/08/2007 | | 0 | 0.2 | 0.15 | 1709 |
| 10/08/2007 | | 0 | 2.5 | 1.5 | 1712 |
| 13/08/2007 | 2.9 | 0 | 0.1 | 0.25 | 0171.25 |
| 14/08/2007 | | | | | |
| 20/08/2007 | 5.7 | 0 | 0.15 | 0.25 | 0171.8 |
| 24/08/2007 | 3.4 | 0 | 0.1 | 0.2 | 1725 |
| 28/08/2007 | 6.2 | 0 | 0.25 | 0.3 | 1726 |
| 14/09/2007 | 1.5 | 0 | 0.2 | 0.4 | 1728 |
| 21/09/2007 | 1.1 | 0 | 0.2 | 0.35 | 1728 |

| Container readings | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Date** | **Inlet vacuum (bar)** | **UV 3.23 (bar)** | **vac pump inlet (bar)** | **temp ($^{o}$C)** | **V3.2 (hours)** | **V3.1 (hours)** | **Compressor** |
| **12/06/2007** | **-0.05** | **-0.65** | **-0.7** | **76** | **3314** | | **ok** |
| 19/06/2007 | -0.375 | -0.775 | 0.00 (off) | 70(left) and 36 (right) | 3371 | | ok |
| 21/06/2007 | -0.67 | -0.82 | 0.00 (off) | 58(left) and 28 (right | 3371 | | ok |
| 25/06/2007 | Jumping -0.25 to -0.3 | -0.8 | 0.00 (off) | 62 (left) and 30 (right) | 3371 | | ok |
| 29/06/2007 | 0.31 | 0.85 | 0.00 (off) | 50 (left) and 26 (right) | | 2128 | ok |
| 02/07/2007 | 0 | 0 | 0.00 (off) | 18 | | 2133 | not running |
| 03/07/2007 | -0.4 | -0.7 | 0.00 (off) | 62.5(L) 30® | | 2154 | ok |
| 06/07/2007 | -0.4 | -9 | 0.00 (off) | 61 (LHS) 24 (RHS) | | 2225 | 0k |
| 09/07/2007 | -0.39 | -0.63 | 0.00 (off) | 52 (LHS) 20(RHS) | | 2252 | ok |
| 13/07/2007 | -0.45 | -0.67 | 0.00 (off) | 74 (LHS) 30 (RHS) | | 2348 | ok |
| 16/07/2007 | Jumping -0.46 to -0.5 | -0.855 | 0.00 (off) | 61 (LHS) 28(RHS) | | 2357 | ok |
| 20/07/2007 | -6 | -0.4 | 0.00 (off) | 56 (LHS) 22 (RHS) | | 2448 | ok |
| 24/07/2007 | -0.4 to -0.35 | -0.475 | 0.00 (off) | 80 (LHS) 30 (RHS) | | 2506 | ok |
| 27/07/2007 | -0.25 to -0.3 | -0.45 | 0.00 (off) | 84 (LHS) 30 (RHS) | 3371 | 2533 | ok |
| 31/07/2007 | -0.35 | -0.45 | 0.00 (off) | 87 (LHS) 37 (RHS) | | 2581 | ok |
| 02/08/2007 | -0.37 | -0.46 | 0.00 (off) | 90 (LHS) 42 (RHS) | | 2629 | ok |
| 06/08/2007 | -0.325 | -0.35 | 0.00 (off) | 83 (LHS) 32 (RHS) | | 2693 | ok |
| 10/08/2007 | -0.2 | -0.4 | 0.00 (off) | 74 (LHS) 27 (RHS) | | 2750 | ok |
| 13/08/2007 | -1.75 | -0.46 | 0.00 (off) | 73 (LHS) 26 (RHS) | | 2760 | ok |
| 14/08/2007 | | | | | | | |
| 20/08/2007 | -0.75 | -0.8 | 0.00 (off) | 56 (LHS) 25 (RHS) | 3501 | 2833 | ok |
| 24/08/2007 | -0.7 | -0.75 | 0.00 | 75 (LHS) 32 (RHS) | 3591 | 2924 | ok |
| 28/08/2007 | -0.55 | -0.7 | 0.00 | 70 (LHS) 34 (RHS) | 3692 | 2935 | ok |
| 14/09/2007 | -0.46 | -0.6 | 0.00 | 81 (LHS) 32 (RHS) | 3784 | 3026 | ok |

| Monitoring Wells | | | | | |
|---|---|---|---|---|---|
| **Date** | **Well Number** | **Depth to water (mbtc)** | **Depth to Water (mbgl)** | **Vacuum Reading (mbar)** | **Comments** |
| 12/06/2007 | MW1 | 9.330 | 8.240 | | no caps |
| | MW2 | 7.220 | 6.115 | | no caps |
| | MW3 | 5.085 | 4.035 | | no caps |
| | MW4 | 11.780 | 10.730 | | no caps |
| | MW5 | 11.055 | 10.030 | | no caps |
| | MW6 | 12.693 | 12.445 | | no caps |
| 18/06/2007 | MW1 | 9.402 | 8.354 | 9.20 | |
| | MW2 | 7.070 | 5.985 | 3.60 | |
| | MW3 | 5.822 | 4.787 | no bung in place, cap not fitted tightly | well fitted with bung. |
| | MW4 | 10.519 | 9.473 | -0.20 | |
| | MW5 | 10.847 | 9.816 | -3.50 | |
| | MW6 | 10.651 | 10.401 | -10.10 | |
| 20/06/2007 | MW1 | 9.540 | 8.481 | | |
| | MW2 | 7.289 | 6.199 | | |
| | MW3 | 5.845 | 4.810 | | |
| | MW4 | 10.502 | 9.456 | | |
| | MW5 | 11.053 | 10.009 | | |
| | MW6 | 12.153 | 11.868 | | |
| 21/06/2007 | MW1 | 9.543 | 8.48 | 0.10 | |
| | MW2 | 7.311 | 6.22 | 2.28 | |
| | MW3 | 5.383 | 4.35 | 0.45 | |
| | MW4 | 10.477 | 9.43 | -0.10 | |
| | MW5 | 10.902 | 9.86 | -1.25 | |
| | MW6 | 10.617 | 10.33 | -2.70 | |
| 25/06/2007 | MW1 | 9.513 | 8.454 | -0.05 | |
| | MW2 | 6.500 | 5.410 | 8.65 | |
| | MW3 | 5.158 | 4.123 | 24.10 | |
| | MW4 | 10.496 | 9.450 | -3.00 | |
| | MW5 | 9.023 | 7.979 | -4.47 | |
| | MW6 | 9.537 | 9.252 | 22.80 | |
| 29/06/2007 | MW1 | 9.572 | 8.513 | 0.00 | |
| | MW2 | 6.869 | 5.779 | 9.11 | |
| | MW3 | 5.428 | 4.393 | 0.40 | |
| | MW4 | 10.627 | 9.581 | -0.21 | |
| | MW5 | 9.642 | 8.598 | 4.00 | |
| | MW6 | 11.396 | 11.111 | -7.25 | |
| 02/07/2007 | MW1 | 9.553 | 8.494 | 0.00 | |
| | MW2 | 6.346 | 5.256 | -7.42 | |
| | MW3 | 2.612 | 1.577 | 6.95 | |
| | MW4 | 8.802 | 7.756 | 5.70 | |
| | MW5 | 8.369 | 7.325 | 0.21 | |
| | MW6 | 7.429 | 7.144 | 6.85 | |
| 03/07/2007 | MW1 | 9.572 | 8.513 | -2.30 | |
| | MW2 | 6.393 | 5.303 | 2.88 | |
| | MW3 | 5.595 | 4.560 | 6.14 | |
| | MW4 | 10.657 | 9.611 | 1.09 | |
| | MW5 | 8.808 | 7.764 | 0.00 | |
| | MW6 | 10.097 | 9.812 | 6.13 | |
| 06/07/2007 | MW1 | 14.567 | 13.508 | -0.11 | |
| | MW2 | 14.763 | 13.673 | 0.00 | |
| | MW3 | 5.990 | 4.955 | -1.02 | |
| | MW4 | 11.837 | 10.791 | 9.36 | |
| | MW5 | 14.180 | 13.136 | -0.52 | |
| | MW6 | 12.274 | 11.989 | 1.39 | |
| 09/07/2007 | MW1 | 14.488 | 13.429 | -0.11 | |
| | MW2 | 14.382 | 13.292 | 0.00 | |
| | MW3 | 5.158 | 4.123 | -1.02 | |
| | MW4 | 10.622 | 9.576 | 9.36 | |
| | MW5 | 12.559 | 11.515 | -0.52 | |
| | MW6 | 10.394 | 10.109 | 1.39 | |
| 13/07/2007 | MW1 | 14.445 | 13.386 | -0.63 | |
| | MW2 | 14.022 | 12.932 | -2.31 | |
| | MW3 | 6.630 | 5.595 | 0.67 | |
| | MW4 | 11.234 | 10.188 | 2 - 25 | values ranged from 2 to 25. Hissing heard from valve. |
| | MW5 | 12.475 | 11.431 | 0.80 | |
| | MW6 | 13.745 | 13.460 | 4.39 | all bungs not fitted correctly |
| 16/07/2007 | MW1 | 14.332 | 13.273 | -0.32 | |
| | MW2 | 13.459 | 12.369 | 1.35 | |
| | MW3 | 5.748 | 4.713 | 6.60 | |
| | MW4 | 10.607 | 9.561 | varied - out of range to -3.1 | hissing heard from valve |
| | MW5 | 10.583 | 9.539 | 0.03 | |
| | MW6 | 10.158 | 9.873 | 29.30 | |
| 20/07/2007 | MW1 | 14.305 | 13.246 | -2.63 | |
| | MW2 | 13.104 | 12.014 | -0.76 | |
| | MW3 | 5.687 | 4.652 | -4.67 | |
| | MW4 | 10.837 | 9.791 | 140.1 Varied out of range | hissing heard from valve |
| | MW5 | 11.981 | 10.937 | 23.88 | |

| Monitoring Wells | | | | | |
|---|---|---|---|---|---|
| **Date** | **Well Number** | **Depth to water (mbtc)** | **Depth to Water (mbgl)** | **Vacuum Reading (mbar)** | **Comments** |
| | MW6 | 13.775 | 13.490 | 18.03 | |
| 24/07/2007 | MW1 | 14.172 | 13.113 | Not taken | |
| | MW2 | 12.371 | 11.281 | Not taken | |
| | MW3 | 5.413 | 4.378 | Not taken | |
| | MW4 | 10.737 | 9.691 | Not taken | |
| | MW5 | 9.928 | 8.884 | Not taken | |
| | MW6 | 9.791 | 9.506 | Not taken | |
| 27/07/2007 | MW1 | 14.083 | 13.024 | Not taken | Bung/cap half open |
| | MW2 | 11.869 | 10.779 | +0.08 | - |
| | MW3 | 5.311 | 4.276 | -2.09 | - |
| | MW4 | 10.738 | 9.692 | Not taken | - |
| | MW5 | 9.785 | 8.741 | Not taken | Cap on, not bung |
| | MW6 | 9.597 | 9.312 | Not taken | Cap on, not bung |
| 31/07/2007 | MW1 | 14.008 | 12.949 | 0.00 | |
| | MW2 | 11.365 | 10.275 | -0.19 | |
| | MW3 | 6.131 | 5.096 | -1.75 | |
| | MW4 | 10.806 | 9.760 | 7.50 | |
| | MW5 | 10.252 | 9.208 | 12.40 | |
| | MW6 | 12.082 | 11.797 | -0.40 | |
| 06/08/2007 | MW1 | 13.961 | 12.902 | -1.56 | |
| | MW2 | 10.754 | 9.664 | -0.66 | |
| | MW3 | 5.662 | 4.627 | 1.99 | |
| | MW4 | 11.090 | 10.044 | | Cap on, not bung |
| | MW5 | 10.913 | 9.869 | 0.58 | |
| | MW6 | 10.842 | 10.557 | | Cap on, not bung |
| 10/08/2007 | MW1 | 13.937 | 12.878 | 0.95 | |
| | MW2 | 10.365 | 9.275 | 0.00 | |
| | MW3 | 5.522 | 4.487 | -0.06 | |
| | MW4 | 11.323 | 10.277 | 0.00 | |
| | MW5 | 11.179 | 10.135 | -0.19 | |
| | MW6 | 11.137 | 10.852 | 0.00 | |
| 13/08/2007 | MW1 | 13.912 | 12.853 | 0.00 | |
| | MW2 | 10.025 | 8.935 | -0.22 | no bung on well initially |
| | MW3 | 5.593 | 4.558 | 0.24 | |
| | MW4 | 11.444 | 10.398 | 2.64 | |
| | MW5 | 11.335 | 10.291 | -0.08 | |
| | MW6 | 12.447 | 12.162 | 9.3 - 13.04 | fluctuating |
| 14/08/2007 | MW1 | 14.184 | 13.125 | | |
| | MW2 | 10.173 | 9.083 | | |
| | MW3 | 5.923 | 4.888 | | |
| | MW4 | 11.566 | 10.520 | | |
| | MW5 | 11.433 | 10.389 | | |
| | MW6 | 11.012 | 10.727 | | |
| 20/08/2007 | MW1 | 14.034 | 12.98 | bungs removed from wells - no vacuum readings taken | |
| | MW2 | 9.529 | 8.44 | | |
| | MW3 | 5.660 | 4.63 | | |
| | MW4 | 10.703 | 9.66 | | |
| | MW5 | 10.316 | 9.27 | | |
| | MW6 | 10.408 | 10.12 | | |
| 24/08/2007 | MW1 | 14.032 | 12.973 | bungs removed from wells - no vacuum readings taken | |
| | MW2 | 9.389 | 8.299 | | |
| | MW3 | 6.172 | 5.137 | | |
| | MW4 | 11.218 | 10.172 | | |
| | MW5 | 11.761 | 10.717 | | |
| | MW6 | 14.077 | 13.792 | | |
| 28/08/2007 | MW1 | 14.006 | 12.95 | bungs removed from wells - no vacuum readings taken | |
| | MW2 | 9.003 | 7.91 | | |
| | MW3 | 6.294 | 5.26 | | |
| | MW4 | 11.482 | 10.44 | | |
| | MW5 | 11.475 | 10.43 | | |
| | MW6 | 13.188 | 12.90 | | |
| 14/09/2007 | MW1 | 14.474 | 13.42 | bungs removed from wells - no vacuum readings taken | |
| | MW2 | 9.927 | 8.84 | | |
| | MW3 | 4.982 | 3.95 | | |
| | MW4 | 12.906 | 11.86 | | |
| | MW5 | 12.133 | 11.09 | | |
| | MW6 | 12.457 | 12.17 | | |
| 21/09/2007 | MW1 | 14.372 | 13.313 | bungs removed from wells - no vacuum readings taken | |
| | MW2 | 9.323 | 8.233 | | |
| | MW3 | 4.645 | 3.610 | | |
| | MW4 | 12.432 | 11.386 | | |
| | MW5 | 11.473 | 10.429 | | |
| | MW6 | 10.155 | 9.870 | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 21/09/2007 | -0.66 | -0.75 | 0.00 | 68 (LHS)<br>31 (RHS) | 3951 | 3118 | ok |

| Remediation Wells | | | | | | |
|---|---|---|---|---|---|---|
| **Date** | **Well Number** | **Pressure (mbar)** | **Vacuum Reading (mbar)** | **PID reading (ppm)** | **DTW** | **Pump Check - Comments** |
| 12/6/07 AM | RW1 | 65 | | 38 | 14.3 | pump v slowly |
| | RW2 | 66 | | 4 | 12.5 | Not pumping |
| | RW3 | 60 | | 70 | 14.364 | pumping 1 per mionute |
| | RW4 | 66 | | 12 | 14.64 | Not pumping |
| | RW5 | 55 | | 7 | 15.55 | Not pumping |
| | RW6 | 62 | | 6 | 14.62 | pumping 1 per mionute |
| 12/6/07 PM | RW1 | 165 | | | | |
| | RW2 | | | | | |
| | RW3 | 163 | | | | |
| | RW4 | 160 | | | | |
| | RW5 | | | | | |
| | RW6 | | | | | |
| 18/06/2007 | RW1 | -345.0 | | | | Hissing noise from well. Water observed to pump |
| | RW2 | 0.0 | | | | Not pumping. No pressure |
| | RW3 | -250.0 | | | | Hissing noise from well. |
| | RW4 | -280.0 | | | | Water observed to pump |
| | RW5 | 0.0 | | | | Not pumping. No pressure |
| | RW6 | 0.0 | | | | Not pumping. No pressure |
| 20/06/2007 | RW1 | -350.0 | | | | hissing noise. Pump cycle ~4-5 min |
| | RW2 | 0.0 | | | | |
| | RW3 | -270.0 | | | | no pumping observed. Very slight, continuous hissing |
| | RW4 | -300.0 | | | | |
| | RW5 | 0.0 | | | | |
| | RW6 | 0.0 | | | | |
| 21/06/2007 | RW1 | 0.0 | out of range | 0.00 | 14.10 - no water | Vapour valve shut. Water valve open. No samples taken |
| | RW2 | 0.0 | N/A | N/A | 11.427 | Vapour valve shut. Water valve open. No samples taken |
| | RW3 | -560.0 | out of range | 0.00 | 5.220 | All valves open. Sampled for VOC and TPH |
| | RW4 | -700.0 | out of range | 0.00 | 14.58 - no water | All valves open. Sampled for VOC and TPH |
| | RW5 | 0.0 | N/A | N/A | 14.493 | Vapour valve shut. Water valve open. Sampled for VOC and TPH |
| | RW6 | 0.0 | N/A | N/A | insufficient time | Vapour valve shut. Water valuve open. Sampled for VOC and TPH |
| 25/06/2007 | RW1 | -200.0 | out of range | 0.00 | dip round not carried out | both valves open. Pumping observed. Hissing noise heard. |
| | RW2 | -60.0 | 0.00 | 0.00 | dip round not carried out | Vapour valve shut. Water valve open. No pumping observed. |
| | RW3 | -150.0 | out of range | 4.20 | dip round not carried out | both valves open. Pumping observed. Hissing noise heard. |
| | RW4 | -150.0 | out of range | 0.00 | dip round not carried out | Vapour valuve open. Water valve partially open. Hissing noise heard. Pumping observed. |
| | RW5 | 0.0 | N/A | N/A | dip round not carried out | All valves shut. No pumping observed. |
| | RW6 | 0.0 | N/A | N/A | dip round not carried out | Vapour valve shut. Water valve open. No umping observed. |
| 29/06/2007 | RW1 | -280.0 | out of range | 29.40 | 12.355 | Both valves open. No pumping observed. Hissing noise heard. No samples taken |
| | RW2 | 0.0 | N/A | 9.20 | 9.777 | Vapour valve shut. Water valve open.No pumping observed. No samples taken |
| | RW3 | -175.0 | out of range | 31.10 | 9.760 | both valves open. Pumping observed. Hissing noise heard. Samples taken. |
| | RW4 | -200.0 | out of range | 15.70 | 13.565 | Vapour valuve open. Water valve partially open. Hissing noise heard. Pumping observed. Samples taken. |
| | RW5 | 0.0 | N/A | 24.70 | 1.365 | All valves shut. No pumping observed. Samples taken |
| | RW6 | 0.0 | N/A | 10.20 | 14.178 | Vapour valve shut. Water valve open. No pumping observed. Samples taken. |
| 02/07/2007 | RW1 | 0.0 | 0.00 | 79.40 | dip round not carried out | Both open - Hissing |
| | RW2 | 0.0 | 0.00 | 5.60 | dip round not carried out | Both open - Hissing |
| | RW3 | 0.0 | 0.00 | 18.70 | dip round not carried out | Both open - Hissing |
| | RW4 | 0.0 | 0.00 | 3.90 | dip round not carried out | Vapour open, water shut - hissing |
| | RW5 | 0.0 | 0.00 | 1.50 | dip round not carried out | Both shut - no pumping |
| | RW6 | 0.0 | 0.00 | 0.00 | dip round not carried out | Both closed - no pumping |
| 03/07/2007 | RW1 | -375.0 | out of range | 0.0 | dip round not carried out | Both open - Hissing |
| | RW2 | -345.0 | out of range | 0.0 | dip round not carried out | Both open - Hissing |
| | RW3 | -250.0 | out of range | 0.0 | dip round not carried out | Both open - Hissing |
| | RW4 | -325.0 | out of range | 0.0 | dip round not carried out | Vapour open, water shut - hissing |
| | RW5 | 0.0 | N/A | 0.0 | dip round not carried out | Both shut - no pumping |
| | RW6 | 0.0 | N/A | 0.0 | dip round not carried out | Both closed - no pumping |
| 06/07/2007 | RW1 | -400.0 | out of range | 0.0 | dip round not carried out | Both open - Hissing |
| | RW2 | -375.0 | out of range | 0.0 | dip round not carried out | Both open - Hissing |
| | RW3 | -280.0 | out of range | 0.0 | dip round not carried out | Both open - Hissing |
| | RW4 | -350.0 | out of range | 0.0 | dip round not carried out | Vapour open, water shut - hissing |
| | RW5 | 0.0 | N/A | 0.0 | dip round not carried out | Both shut - no pumping |
| | RW6 | 0.0 | N/A | 0.0 | dip round not carried out | Both closed - no pumping |
| 09/07/2007 | RW1 | -330.0 | out of range | 0.0 | dip round not carried out | Both open - Hissing |
| | RW2 | -310.0 | out of range | 0.0 | dip round not carried out | Both open - Hissing |
| | RW3 | -220.0 | out of range | 0.0 | dip round not carried out | Both open - Hissing |
| | RW4 | -300.0 | out of range | 0.0 | dip round not carried out | Vapour open, water shut - hissing |
| | RW5 | 0.0 | N/A | 0.0 | dip round not carried out | Both closed - no pumping |
| | RW6 | 0.0 | N/A | 0.0 | dip round not carried out | Both closed - no pumping |
| 13/07/2007 | RW1 | -360.0 | out of range | unable to take PID readings | dip round not carried out | Both valves open. Hissing heard. |
| | RW2 | -330.0 | out of range | | dip round not carried out | Both valves open. Hissing heard. |
| | RW3 | -250.0 | out of range | | dip round not carried out | Both valves open. Hissing heard. |
| | RW4 | -320.0 | out of range | | dip round not carried out | Vapour valuve open. Water valve partially open. Hissing heard. |
| | RW5 | 0.0 | N/A | | dip round not carried out | Both valves shut. |
| | RW6 | 0.0 | N/A | | dip round not carried out | Both valves shut. |
| 16/07/2007 | RW1 | -460.0 | out of range | 0.00 | dip round not carried out | slight hissing heard. Both valves open. |
| | RW2 | -400.0 | out of range | 0.00 | dip round not carried out | Hissing heard. Both valves open. |
| | RW3 | -335.0 | out of range | 0.50 | dip round not carried out | Hissing heard. Both valves open. Pumping observed. |
| | RW4 | -445.0 | out of range | 0.00 | dip round not carried out | Vapour valve open. Water valve partially open. Hissing heard. |
| | RW5 | 0.0 | N/A | 0.20 | dip round not carried out | Both valves shut. |
| | RW6 | 0.0 | N/A | 0.10 | dip round not carried out | Both valves shut. |
| 20/07/2007 | RW1 | -700.0 | out of range | - | dip round not carried out | slight hissing heard - pumping obs. Both valves open. |
| | RW2 | -650.0 | out of range | - | dip round not carried out | Hissing heard. Both valves open. |
| | RW3 | -600.0 | out of range | - | dip round not carried out | Hissing heard. Both valves open. Pumping observed. |
| | RW4 | -600.0 | out of range | - | dip round not carried out | Vapour valve open. Water valve partially open. Hissing heard. |
| | RW5 | 0.0 | N/A | - | dip round not carried out | Both valves shut. |
| | RW6 | 0.0 | N/A | - | dip round not carried out | Both valves shut. |

| Remediation Wells | | | | | | |
|---|---|---|---|---|---|---|
| **Date** | **Well Number** | **Pressure (mbar)** | **Vacuum Reading (mbar)** | **PID reading (ppm)** | **DTW** | **Pump Check - Comments** |
| 24/07/2007 | RW1 | -250.0 | out of range | - | dip round not carried out | Hissing heard - Gauge fluctuating |
| | RW2 | -290.0 | out of range | - | dip round not carried out | Hissing heard. Both valves open. |
| | RW3 | -300.0 | out of range | - | dip round not carried out | Hissing heard. Both valves open. Pumping observed. |
| | RW4 | -260.0 | out of range | - | dip round not carried out | Vapour valve open. Water valve partially open. Hissing heard. |
| | RW5 | 0.0 | N/A | - | dip round not carried out | Both valves shut. |
| | RW6 | 0.0 | N/A | - | dip round not carried out | Both valves shut. |
| 27/07/2007 | RW1 | -200.0 | out of range | 0.1 | dip round not carried out | Hissing heard. Both valves open. |
| | RW2 | 0.0 | N/A | 0.0 | dip round not carried out | No hissing. Vapour valve shut, water valve open |
| | RW3 | -150.0 | out of range | 0.0 | dip round not carried out | Hissing heard. Both valves open. |
| | RW4 | -200.0 | out of range | 0.0 | dip round not carried out | Vapour valve open. Water valve partially open. Hissing heard. |
| | RW5 | 0.0 | N/A | 0.2 | dip round not carried out | Both valves shut. |
| | RW6 | 0.0 | N/A | 0.0 | dip round not carried out | Both valves shut. |
| 31/07/2007 | RW1 | -300.0 | out of range | 0.0 | dip round not carried out | Both open. Hissing. Pumping observed |
| | RW2 | 0.0 | N/A | N/A | dip round not carried out | Vapour shut. Water open. |
| | RW3 | -215.0 | out of range | 1.3 | dip round not carried out | Both open, slight hissing, pumping observed. |
| | RW4 | -310.0 | out of range | 0.8 | dip round not carried out | Vapour open, water partially open. Hissing. Pumping observed. |
| | RW5 | 0.0 | N/A | N/A | dip round not carried out | Both shut (off) |
| | RW6 | 0.0 | N/A | N/A | dip round not carried out | Both shut (off) |
| 02/08/2007 | RW1 | -310.0 | out of range | 0.0 | dip round not carried out | Both valves open, hissing, pumping observed |
| | RW2 | 0.0 | N/A | N/A | dip round not carried out | Water open, vapour shut. |
| | RW3 | -250.0 | out of range | 4.3 | dip round not carried out | Both valves open, hissing, pumping observed |
| | RW4 | -515.0 | out of range | 0.0 | dip round not carried out | Water valve open, vapour valve partially open, hissing, pumping observed. |
| | RW5 | 0.0 | N/A | N/A | dip round not carried out | Both valves shut. |
| | RW6 | 0.0 | N/A | N/A | dip round not carried out | Both valves shut. |
| 06/08/2007 | RW1 | -250.0 | out of range | 0.0 | dip round not carried out | Both valves open, hissing, pumping observed |
| | RW2 | 0.0 | N/A | 0.00 | dip round not carried out | Water open, vapour shut. |
| | RW3 | -200.0 | out of range | 3.1 | dip round not carried out | Both valves open, hissing, pumping observed |
| | RW4 | -330.0 | out of range | 0.0 | dip round not carried out | Water valve open, vapour valve partially open, hissing, pumping observed. |
| | RW5 | 0.0 | N/A | 0.10 | dip round not carried out | Both valves shut. |
| | RW6 | 0.0 | N/A | 2.10 | dip round not carried out | Both valves shut. |
| 10/08/2007 | RW1 | -125.0 | out of range | | dip round not carried out | Both valves open, hissing |
| | RW2 | 0.0 | N/A | | dip round not carried out | Water open, vapour shut. |
| | RW3 | -50.0 | out of range | | dip round not carried out | Both valves open, hissing, pumping observed - gauge initially read 0.0 |
| | RW4 | -120.0 | out of range | | dip round not carried out | Water valve open, vapour valve partially open, hissing, pumping observed. |
| | RW5 | 0.0 | N/A | | dip round not carried out | Both valves shut. |
| | RW6 | 0.0 | N/A | | dip round not carried out | Both valves shut. |
| 13/08/2007 | RW1 | -100.0 | 142.30 | 0.0 | dip round not carried out | Both valves open - hissing |
| | RW2 | 0.0 | N/A | N/A | dip round not carried out | Vapour valve off, water open |
| | RW3 | -15.0 | 161.50 | 0.0 | dip round not carried out | Both valves open. Pumping observed. |
| | RW4 | -130.0 | out of range | 0.0 | dip round not carried out | Vapour open, water partially open. Hissing. Pumping observed. |
| | RW5 | 0.0 | N/A | N/A | dip round not carried out | Both valves shut. |
| | RW6 | 0.0 | N/A | N/A | dip round not carried out | Both valves shut. |
| 14/08/2007 | RW1 | | | | No water, no progress after 9.130 mbtc | |
| | RW2 | | | | 5.65 and rising | |
| | RW3 | | | | 8.797 | |
| | RW4 | | | | No water, no progress after 9.856 mbtc | |
| | RW5 | | | | No water, no progress after 4.903 mbtc | |
| | RW6 | | | | No water, no progress after 8.57 mbtc | |
| 20/08/2007 | RW1 | 0.00 | N/A | N/A | dip round not carried out | Vapour shut. Water open. |
| | RW2 | 0.00 | N/A | N/A | dip round not carried out | Vapour shut. Water open. |
| | RW3 | -630 | out of range | 0.00 | dip round not carried out | Both open, hissing heard. |
| | RW4 | -700 | out of range | 0.00 | dip round not carried out | Both open, hissing heard. |
| | RW5 | 0.00 | N/A | N/A | dip round not carried out | Vapour shut. Water open. |
| | RW6 | 0.00 | N/A | N/A | dip round not carried out | Vapour shut. Water open. |
| 24/08/2007 | RW1 | 0.00 | N/A | 0.10 | dip round not carried out | Vapout shut, water open. |
| | RW2 | -600.00 | out of range | 0.00 | dip round not carried out | Both open, hissing heard. |
| | RW3 | -525 | out of range | 0.00 | dip round not carried out | Both open, hissing, pumping observed |
| | RW4 | -600 | out of range | 0.00 | dip round not carried out | Both open, hissing, pumping observed |
| | RW5 | 0.00 | N/A | 0.00 | dip round not carried out | Vapour shut. Water open. |
| | RW6 | 0.00 | N/A | 2.00 | dip round not carried out | Vapour shut. Water open. |
| 28/08/2007 | RW1 | 0.00 | N/A | 3.20 | dip round not carried out | Vapour shut. Water open. |
| | RW2 | -500.00 | out of range | 0.00 | dip round not carried out | Both open. Hissing heard. |
| | RW3 | -425 | out of range | 0.30 | dip round not carried out | Both open, hissing, pumping observed |
| | RW4 | -490 | out of range | 0.00 | dip round not carried out | Both open, hissing, pumping observed |
| | RW5 | 0.00 | N/A | 0.00 | dip round not carried out | Vapour shut. Water open. |
| | RW6 | 0.00 | N/A | 0.00 | dip round not carried out | Vapour shut. Water open. |
| 14/09/2007 | RW1 | 0.00 | | 0.50 | dip round not carried out | Vapour shut. Water open. |
| | RW2 | -360.00 | | 0.00 | dip round not carried out | Both open. Hissing heard. |
| | RW3 | 0 | | 0.00 | dip round not carried out | Pump not fully in well - stuck at 5m |
| | RW4 | -360 | | 0.00 | dip round not carried out | Both open, hissing, pumping observed |
| | RW5 | 0.00 | | 23.00 | dip round not carried out | Vapour shut. Water open. |
| | RW6 | -175.00 | | 0.10 | dip round not carried out | Vapour partly open - water open. Hissing. |
| | RW1 | 0.00 | N/A | 11.9 (max) | dip round not carried out | Water open, vapour shut. |
| | RW2 | 0.00 | N/A | 0.00 | dip round not carried out | Water open, vapour shut. (Vapour opened after monitoring round - 475ppm, hissing heard) |
| | RW3 | 0.00 | N/A | 0.00 | dip round not carried out | pump stuck at 5m |
| | RW4 | 575 | out of range | 0.00 | dip round not carried out | both open, hissing heard, pumping observed |
| | RW5 | 0.00 | N/A | 0.70 | dip round not carried out | water open, vapour shut |
| | RW6 | 300.00 | out of range | 0.10 | dip round not carried out | Water open, vapour part open, lots hissing heard |

# Solvent Reduction Works - Close Out Correspondence

**Martin Chapple/Bristol/URSCorp**
03/09/2007 15:34

To andrea.mann@environment-agency.wales.gov.uk
cc Steve Coates/Bristol/URSCorp@URSCORP, mark_stevenson@urscorp.com, Simon Gomm/Birmingham/URSCorp@URSCorp
bcc
Subject BP Llandarcy Area 1, Solvent mass-reduction effort

History: This message has been forwarded.

Hi Andrea

In your correspondence of August 2nd, 2006, regarding the multiphase extraction-based solvent mass-reduction system (proposed for the solvent identified in the vicinity of the former degreasing pit), you asked for an update on the operation of the system.

The solvent mass-reduction system has been operating at Area 1 for four months. System performance data demonstrate some recovery of solvent in the early part of this operational period. This recovery has now tailed off, such that there appears to be no technical basis for continuation of operation of the system, and it is proposed to be shut off in the near future - this to be confirmed with licensing.

On the basis of your interest, however, I was proposing a short 'informational' meeting to discuss the findings with you in the near future (this assuming you require one). If so, I was hoping you might suggest a date for same.

Regards

Martin Chapple
Principal Geologist

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Place of registration: Scotland
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Registered office: 243 West George Street, Glasgow G2 4QE

Martin Chapple/Bristol/URSCorp
24/09/2007 16:30

To Steve Coates/Bristol/URSCorp@URSCORP
cc "Hiscock, Steve" <Steve.Hiscock@uk.bp.com>
bcc
Subject EA Meeting, Solvent Source-Reduction

Steve

By way of an update to share with the wider team, Steve Hiscock (BP) and I led a meeting this morning with Environment Agency Water/Contaminated Land personnel (Andrea Mann, Trystan James, and Shane Evans) regarding the solvent reduction effort in Area 1.

I gave a presentation using a series of handouts, basically leading them through the investigation and risk assessment works, and the remedial programme, and culminating in a discussion of the system performance, which shows good initial mass-recovery, but declining to asymptotic levels, ie, further operation of the system is not going to yield any significant recovery. The position that this was a voluntary programme, and that no risks had been identified to warrant it was reinforced with the attendees, who again registered their agreement. They made the assumption that documentation of the works would be available (as required) for their review in support of future planning decisions, for which they would be a statutory consultee.

The EA had very few questions, and were supportive. On this basis, it is Steve Hiscock's and my opinion that if a view is sought of the Water/Contaminated Land section by the EA's licensing section, we believe that there is unlikely to be any issues raised by them in terms of requirements for additional operation or monitoring and we believe that they would concur with a decision to cease operations.

On this basis, therefore, it is their expectation that the system will be decommissioned shortly. I am unsure where CRL are with respect to cessation with the Licensing section - cessation of operation will have its own requirements set when the Working Plan for this part of the Area 1 operation was agreed with them.

Regards

Martin Chapple
Principal Geologist

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# Appendix E - Tank Removal – Llandarcy Refinery Filling Station, October 2002

URS

# Memorandum

Date: 15th November 2002 (FILE MEMO)

To: Simon Gibbons

From: Julie Porter

Subject: **Tank Removal – Llandarcy Refinery Filling Station, October 2002**

**Introduction**

On the 29th October 2002, BP requested that URS attend site to observe and sample the quality of soils surrounding three underground storage tanks (UST's) in the refinery Filling Station area of the Llandarcy site.

Prior to the site visit by URS, the three underground storage tanks were excavated and removed from the area by BP. BP reported that the tanks had previously been decommissioned (approximately 2 years previously), and filled with water. BP reported that the tanks were observed to be full of water when they were removed.

**Site Observations and Sampling**

Three below ground brick chambers associated with the three former UST's (approximately 1.5 m by 3 m) were observed during the site visit. The brick chambers were excavated by BP during the site visit to expose the soils beneath. Six soil validation samples were collected by URS along the walls and base of the excavation. During the sampling works a slight to strong hydrocarbon odour was noted.

Groundwater ingress was observed to enter the excavation during the works. An oily sheen was observed on the groundwater. The excavation was dewatered, however water continued to seep into the excavation. Both a product and water sample were collected by URS from the base of the excavation.

Photographs of the excavation are attached to this memo.

The excavation was backfilled by BP following collection of the soil and groundwater samples.

**Results**

Soil

Elevated hydrocarbon concentrations were reported in all six of the soil samples collected with concentrations of Total TPH in the range 77mg/kg to 3800mg/kg. The highest TPH concentrations was observed in sample UST 5, which was collected form the wall of the excavation at an approximate depth of 0.8 metres.

Elevated concentrations of benzene, toluene ehylbenzene and xylene were reported in two of the six soil samples analysed (UST 5 and UST 6) with concentrations in the range 107 μg/kg to 15,200 μg/kg. A summary of soil results are presented in Table 1 attached.

URS

Groundwater

Elevated hydrocarbon concentrations were reported in the one water sample collected from the base of the excavation with a Total TPH concentration of 606,630 μg/l. A product sample was also collected from the base of the excavation. The product identification infers that the product collected was weathered diesel. A summary of groundwater results are presented in Table 1 attached.

Analytical results from the laboratory are attached to this memo.


59.93
60.06
59.86
59.71
59.50
59.37
59.10
58.98
BH
58.55
58.40
59.62
59.00
58.78
RS
FH
IC
IC
Concrete Apron
Disturbed Ground
LP
IC
IC
IC
Raised Grassed Area
VP
IC
Raised Grassed Area
Concrete Duct
Path
58.85
58.58
IC
58.65
58.81
59.00
59.36
0 2 4 6
Meters
Legend
Area of Excavation
Area 1 Remediation boundary
Sketch of the area of tank excavation based on observation of disturbed ground (6th June 2006)
Source Data for Boundaries:
Planning Boundary - Arup DWG 113013/CG1251/PD, Planning Application No 3 Substituted Land, Dated 05/04/05
Source Data for Remediation Boundary:
Based on Edward Ware Home's Development Layout supplied to URS by Robert Adam Architects Dated 06/12/05
Title SKETCH OF AREA OF FORMER DIESEL/PETROL UST
Location BP LLANDARCY REFINERY
Client BP LLANDARCY REFINERY LTD
URS
Appr'd:
Drawn:
Date: JUNE 2006
DRAFT
Ref: GIS
Scale: 1:131
Job No: 44382624
Drg Size: A4
FIGURE 1

| | | UST 6 | UST 1 - 2.0 | UST 2 - 1.0 | UST 3 - 2.0 | UST 4 - 0.5 | UST 5 - 0.8 | UST 6 - 2.0 |
|---|---|---|---|---|---|---|---|---|
| | | ug/l | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | | WATER | SOLID | SOLID | SOLID | SOLID | SOLID | SOLID |
| Aliphatic | C6-C8 | <50 | 146 | - | 19 | <5 | <5 | 32 |
| | C8-C10 | 1240 | 41 | - | <5 | <5 | <5 | <5 |
| | C10-C12 | 13300 | 20 | - | <5 | 15 | 41 | 16 |
| | C12-C16 | 155000 | <10 | - | 70 | 512 | 960 | 211 |
| | C16-C21 | 192000 | <10 | - | 66 | 654 | 1470 | 244 |
| | C21-C40 | 36300 | <25 | - | <25 | 59 | 248 | <25 |
| Aromatic | C6-C7 | <50 | 12 | - | <5 | <5 | <5 | <5 |
| | C7-C8 | <50 | 43 | - | <5 | <5 | <5 | <5 |
| | C8-C10 | <50 | 181 | - | <5 | <5 | 7 | <5 |
| | C10-C12 | 2590 | 75 | - | <5 | <5 | 18 | <5 |
| | C12-C16 | 65100 | 27 | - | <10 | 200 | 271 | 146 |
| | C16-C21 | 112000 | <10 | - | <10 | 489 | 812 | 170 |
| | C21-C40 | 28900 | <25 | - | <25 | 316 | 142 | 32 |

| | | UST 6 | UST 1 - 2.0 | UST 2 - 1.0 | UST 3 - 2.0 | UST 4 - 0.5 | UST 5 - 0.8 | UST 6 - 2.0 |
|---|---|---|---|---|---|---|---|---|
| | | ug/l | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| | MRL | WATER | SOLID | SOLID | SOLID | SOLID | SOLID | SOLID |
| C6-C8 | 5 | - | 215 | ND | ND | ND | 6 | ND |
| C8-C10 | 5 | - | 306 | ND | ND | ND | 33 | 6 |
| C10-C16 | 10 | - | 220 | 121 | ND | 521 | 981 | 636 |
| C16-C24 | 10 | - | 39 | 197 | 23 | 940 | 2170 | 1130 |
| C24-C40 | 25 | - | ND | 276 | 54 | 420 | 607 | 201 |
| TOTAL | | 606,630 | 781 | 593 | 77 | 1880 | 3800 | 1970 |

| | | UST 6 | UST 1 - 2.0 | UST 2 - 1.0 | UST 3 - 2.0 | UST 4 - 0.5 | UST 5 - 0.8 | UST 6 - 2.0 |
|---|---|---|---|---|---|---|---|---|
| | | ug/l | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg |
| | | WATER | SOLID | SOLID | SOLID | SOLID | SOLID | SOLID |
| Benzene | 5 | - | ND | ND | ND | ND | 540 | ND |
| Toluene | 5 | - | ND | ND | ND | ND | 471 | 107 |
| Ethylbenzene | 5 | - | ND | ND | ND | ND | 2380 | 127 |
| m,p-Xylene | 10 | - | ND | ND | ND | ND | 15200 | 604 |
| o-Xylene | 5 | - | ND | ND | ND | ND | 2400 | 202 |
| | | | | | | | | |
| GRO | 5 | - | 158 | ND | ND | 217 | 93900 | 12400 |











# RISK BASED TPH

Client Name: **URS CORPORATION LTD**

| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373243 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 1-2.0 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | Report Date: | 2-Jan-03 |

CONCENTRATION UNITS >C6-C40: mg/kg

| ALIPHATIC | RESULT |
|---|---|
| >C6 - C8 | 146 |
| >C8 - C10 | 41 |
| >C10-C12 | 20 |
| >C12-C16 | <10 |
| >C16-C21 | <10 |
| >C21-C40 | <25 |

| AROMATIC | RESULT |
|---|---|
| >C6 - C7 | 12 |
| >C7 - C8 | 43 |
| >C8 - C10 | 181 |
| >C10-C12 | 75 |
| >C12-C16 | 27 |
| >C16-C21 | <10 |
| >C21-C40 | <25 |

# RISK BASED TPH

Client Name: **URS CORPORATION LTD**

| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373244 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 3-2.0 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | Report Date: | 27-Dec-02 |

CONCENTRATION UNITS >C6-C40: mg/kg

| ALIPHATIC | RESULT |
|---|---|
| >C6 - C8 | 19 |
| >C8 - C10 | <5 |
| >C10-C12 | <5 |
| >C12-C16 | 70 |
| >C16-C21 | 66 |
| >C21-C40 | <25 |

| AROMATIC | RESULT |
|---|---|
| >C6 - C7 | <5 |
| >C7 - C8 | <5 |
| >C8 - C10 | <5 |
| >C10-C12 | <5 |
| >C12-C16 | <10 |
| >C16-C21 | <10 |
| >C21-C40 | <25 |

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# RISK BASED TPH

Client Name: **URS CORPORATION LTD**

| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373246 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 4-0.5 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | Report Date: | 2-Jan-03 |

CONCENTRATION UNITS >C6-C40: mg/kg

| ALIPHATIC | RESULT |
|---|---|
| >C6 - C8 | <5 |
| >C8 - C10 | <5 |
| >C10-C12 | 15 |
| >C12-C16 | 512 |
| >C16-C21 | 654 |
| >C21-C40 | 59 |

| AROMATIC | RESULT |
|---|---|
| >C6 - C7 | <5 |
| >C7 - C8 | <5 |
| >C8 - C10 | <5 |
| >C10-C12 | <5 |
| >C12-C16 | 200 |
| >C16-C21 | 489 |
| >C21-C40 | 316 |

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# RISK BASED TPH

Client Name: **URS CORPORATION LTD**

| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373247 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 5-0.8 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | Report Date: | 27-Dec-02 |

CONCENTRATION UNITS >C6-C40: mg/kg

| ALIPHATIC | RESULT |
|---|---|
| >C6 - C8 | <5 |
| >C8 - C10 | <5 |
| >C10-C12 | 41 |
| >C12-C16 | 960 |
| >C16-C21 | 1470 |
| >C21-C40 | 248 |

| AROMATIC | RESULT |
|---|---|
| >C6 - C7 | <5 |
| >C7 - C8 | <5 |
| >C8 - C10 | 7 |
| >C10-C12 | 18 |
| >C12-C16 | 271 |
| >C16-C21 | 812 |
| >C21-C40 | 142 |

SEVERN TRENT STL
Environmental Leadership

# RISK BASED TPH

Client Name: **URS CORPORATION LTD**

| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373248 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 6-2.0 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | Report Date: | 27-Dec-02 |

CONCENTRATION UNITS >C6-C40: mg/kg

| ALIPHATIC | RESULT |
|---|---|
| >C6 - C8 | 32 |
| >C8 - C10 | <5 |
| >C10-C12 | 16 |
| >C12-C16 | 211 |
| >C16-C21 | 244 |
| >C21-C40 | <25 |

| AROMATIC | RESULT |
|---|---|
| >C6 - C7 | <5 |
| >C7 - C8 | <5 |
| >C8 - C10 | <5 |
| >C10-C12 | <5 |
| >C12-C16 | 146 |
| >C16-C21 | 170 |
| >C21-C40 | 32 |

# SEVERN TRENT LABORATORIES LTD

## REGISTRATION DOCUMENT

39971
Llandarcy

| | |
|---|---|
| CUSTOMER | URS |
| CONTACT NAME | Julie Porter |
| TELEPHONE No | 02920465960 |

| | SERVICE USED | DATE | TIME |
|---|---|---|---|
| DELIVERY | BLEND 74602 | 24/10 | £20 |
| COLLECTION | | | |

| FAST TRACK | YES | NO |
|---|---|---|
| AGREED BY | | |
| COMPLETION DATE | 14.11.2 | |

COURIER CHECKED

| | DATE | TIME | INITS |
|---|---|---|---|
| PLES RECEIVED | 31/10/02 | | |
| LYSIS CONFIRMED | 31/10/02 | 900 | M |
| ISTERED | 01/11/02 | | M |
| CTRONIC REGISTRATION | | | |
| NSFER TO LIMS | | | |
| NDMENTS | | | |
| HORISED BY | 04/11 | 930 | VF |
| STATUS CONFIRMED | | | |
| FIRMATION LETTER SENT | | | |
| DATED BY | | | |
| ORTED BY | 11.11.02 | 16:20 | DJ |
| ORT SAVED | " | " | " |

| JOB No | 1650991 |
|---|---|
| PRE REG JOB No | |
| CUSTOMER CODE | DA067 |
| No OF SAMPLES | 9 |
| SAMPLE No RANGE | 37326048 |
| PRE REG No RANGE | |
| QUOTE No | |
| ORDER No | C1374 IJP |
| PRODUCT CODE | 2002 |
| SECTION ID | 292 |
| INVOICE No | 121213 |
| ANALYSIS PRICE | |
| REPORT ISSUE No | 1 11.11.02 |

| | DATE | TIME | INITS |
|---|---|---|---|
| -REGISTERED | | | |
| ROVED BY | | | |

| | | |
|---|---|---|
| SAMPLES SATISFACTORY | YES | NO |

PLE COMMENTS/SPECIAL INSTRUCTIONS

UNCON

6 × BTEX @ £15.00
6 × GRO @ £20.00
6 × TPH @ £20.00

**Soil Containers**

| Job No | | Date Received | |
|---|---|---|---|
| Initials | | Page of | |

| Sample Description | Container type | Quantity Received | Comments |
|---|---|---|---|
| | 1kg Plastic Pot | | |
| | 2kg Plastic Pot | | |
| | 500ml Glass Jar | | |
| | 120ml Glass Jar | | |
| | BAE Jar | | |
| | Bag | | |
| | Phenol Jar | | |

| Sample Description | Container Type | Quantity Received | Comments |
|---|---|---|---|
| | Clear 1L Glass | | |
| | Brown 1L Glass | | |
| | 1L PET | | |
| | 500ml Metal Bottle | | |
| | VOC Vial | | |
| | Mercury Bottle | | |
| | Monophenol Pot | | |
| | Cyanide Pot | | |
| | Sulphide Pot | | |
| | | | |

| Sample date | Sample description | Determinands | Suites |
|---|---|---|---|
| | | | |

| Sample date | Sample description | Determinands | Suites |
|---|---|---|---|
| | | | |

| Sample date | Sample description | Determinands | Suites |
|---|---|---|---|
| | | | |

# JOB BOTTLE REPORT 165099 01/11/02 15:01 Page 1

Customer: **URS Corporation Limited**
Description: **39991 BPLlandarcy**
Location: **39991 BPLlandarcy**
Received date: 31/10/2002

| Sample | Qty | Bottle | Size | Checked | Sent | Receive |
|---|---|---|---|---|---|---|
| 373240 | 9 | Not Used | None | . | . | . |
| 373241 | 9 | Not Used | None | . | . | . |
| 373242 | 9 | Not Used | None | . | . | . |
| 373243 | 9 | Not Used | None | . | . | . |
| 373244 | 9 | Not Used | None | . | . | . |
| 373245 | 9 | Not Used | None | . | . | . |
| 373246 | 9 | Not Used | None | . | . | . |
| 373247 | 9 | Not Used | None | . | . | . |
| 373248 | 9 | Not Used | None | . | . | . |
| 373240 | 9 | SVOC/DRO (Soil) | 500ml Amber glassj | . | . | . |
| 373241 | 9 | SVOC/DRO (Soil) | 500ml Amber glassj | . | . | . |
| 373242 | 9 | SVOC/DRO (Soil) | 500ml Amber glassj | . | . | . |
| 373243 | 9 | SVOC/DRO (Soil) | 500ml Amber glassj | . | . | . |
| 373244 | 9 | SVOC/DRO (Soil) | 500ml Amber glassj | . | . | . |
| 373245 | 9 | SVOC/DRO (Soil) | 500ml Amber glassj | . | . | . |
| 373246 | 9 | SVOC/DRO (Soil) | 500ml Amber glassj | . | . | . |
| 373247 | 9 | SVOC/DRO (Soil) | 500ml Amber glassj | . | . | . |
| 373248 | 9 | SVOC/DRO (Soil) | 500ml Amber glassj | . | . | . |

Checked Date: _____ Checked Signature: _____

Sent Date: _____ Sent Signature: _____

Received Date: _____ Received Signature: _____

# JOB REPORT 165099

01/11/2002 15:01:36

Description **39991 BPLlandarcy**
Location **39991 BPLlandarcy**

Due date: 14/11/2002 Received date: 31/10/2002 Product Group: 242

R Ms Julie Porter, 1 Drake Walk, Brigantine Place, , Cardiff, , CF10 4AN, 02920 465960, Fax: 02920 465961
I Ms Julie Porter, 1 Drake Walk, Brigantine Place, , Cardiff, , CF10 4AN, 02920 465960, Fax: 02920 465961

***373240 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: REFERENCE MATERIAL Date: 31/10/02 / 1 Function: WA Reason: B1
Completion Date: 14/11/02 Method: 1
G0D* TPH mg/kg G3H* GRO(LOW) ug/kg G4G* BTEX ug/kg

***373241 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: AQC SPIKE Date: 31/10/02 / 2 Function: WA Reason: B1
Completion Date: 14/11/02 Method: 1
G0D* TPH mg/kg G3H* GRO(LOW) ug/kg G4G* BTEX ug/kg

***373242 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: AQC BLANK Date: 31/10/02 / 3 Function: WA Reason: B1
Completion Date: 14/11/02 Method: 1
G0D* TPH mg/kg G3H* GRO(LOW) ug/kg G4G* BTEX ug/kg

***373243 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: UST 1 -2.0 Date: 31/10/02 / 4 Function: WA Reason: B1
Completion Date: 14/11/02 Method: 1
G0D* TPH mg/kg G3H* GRO(LOW) ug/kg G4G* BTEX ug/kg

***373244 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: UST 2 -1.0 Date: 31/10/02 / 5 Function: WA Reason: B1
Completion Date: 14/11/02 Method: 1
G0D* TPH mg/kg G3H* GRO(LOW) ug/kg G4G* BTEX ug/kg

***373245 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: UST 3 -2.0 Date: 31/10/02 / 6 Function: WA Reason: B1
Completion Date: 14/11/02 Method: 1
G0D* TPH mg/kg G3H* GRO(LOW) ug/kg G4G* BTEX ug/kg

***373246 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: UST 4 -0.5 Date: 31/10/02 / 7 Function: WA Reason: B1
Completion Date: 14/11/02 Method: 1
G0D* TPH mg/kg G3H* GRO(LOW) ug/kg G4G* BTEX ug/kg

***373247 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: UST 5 -0.8 Date: 31/10/02 / 8 Function: WA Reason: B1
Completion Date: 14/11/02 Method: 1
G0D* TPH mg/kg G3H* GRO(LOW) ug/kg G4G* BTEX ug/kg

***373248 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: UST 6 -2.0 Date: 31/10/02 / 9 Function: WA Reason: B1
Completion Date: 14/11/02 Method: 1
G0D* TPH mg/kg G3H* GRO(LOW) ug/kg G4G* BTEX ug/kg

SEVERN TRENT STL

Environmental Leadership

***Ms Porter***
***URS Corporation Limited***
***1 Drake Walk***
***Brigantine Place***
***Cardiff CF10 4AN***

04 November 2002

**Job Reference : TH/165099/2002**

**9 Sample(s) received**

Dear Ms Porter,

The sample(s) submitted on 31/10/2002 are being processed.

Should you have any queries on the above sample(s) please contact Bronya Taylor referring to the above STL Job number reference

Please see the attached job report documents.

Yours Sincerely,

Signed :

Name : *pp Bronya Taylor*

Title : Senior Customer Services Coordinator

UKAS TESTING
1314
0897
1229

INVESTOR IN PEOPLE

ISO 9001 UKAS QUALITY MANAGEMENT
Cert. No.Q6687

ISO 14001 UKAS ENVIRONMENTAL MANAGEMENT
Cert. No. EI0269

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Registration No. 2148934
Registered Office:
2297 Coventry Road,
Birmingham B26 3PU

**Severn Trent Laboratories Limited.**
**STL Coventry** • STL Business Centre, Torrington Avenue, Coventry, CV4 9GU United Kingdom
Tel +44 (0)2476 421 213 Fax +44 (0)2476 856 575 • *www.stl-analytical.co.uk*

# TOTAL PETROLEUM HYDROCARBONS

Client Name: **URS CORPORATION LTD**

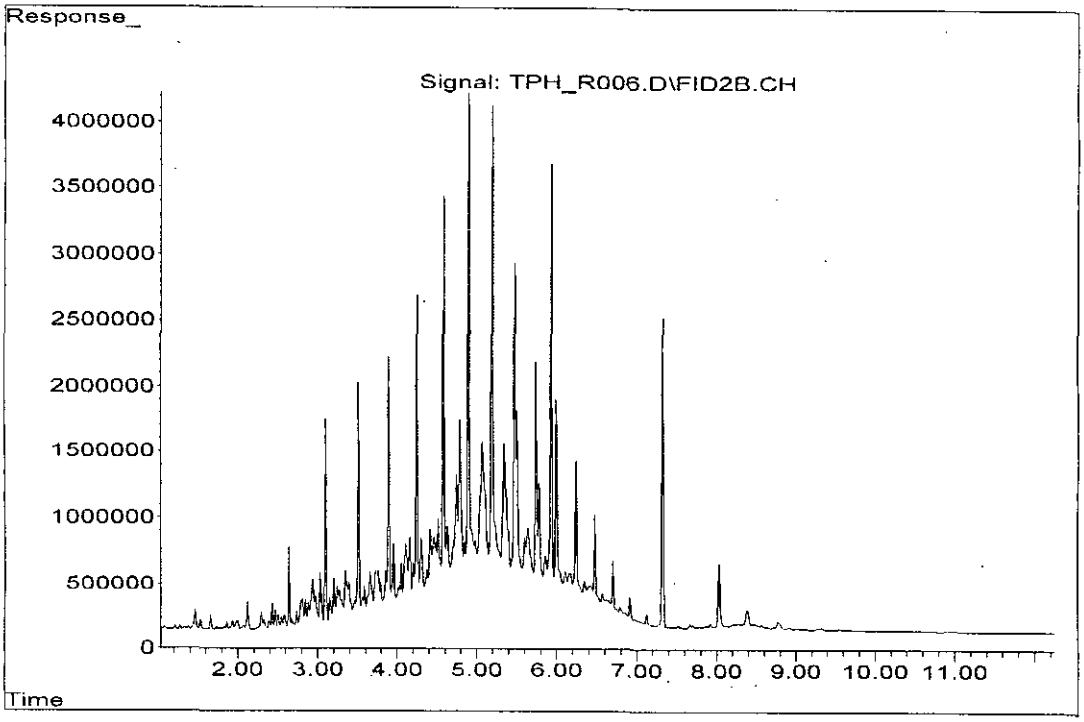
| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373241 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | QC SPK 126811 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | | |
| Weight(g): | 5 | | |
| Dilution Factor: | 1 | | |
| Report Date: | 8-Nov-2002 | CONCENTRATION UNITS: | mg/kg |

## RESULTS

| RANGE | MRL | RESULT |
|---|---|---|
| >C6 - C8 | 5 | ND |
| >C8 - C10 | 5 | 103 |
| >C10 - C16 | 10 | 1040 |
| >C16 - C24 | 10 | 660 |
| >C24 - C40 | 25 | 56 |
| **TOTAL TPH >C6 - C40** | | **1860** |

MRL = MINIMUM REPORTING LIMIT
ND = NOT DETECTED

## CHROMATOGRAM




SEVERN TRENT STL
Environmental Leadership

# TOTAL PETROLEUM HYDROCARBONS

Client Name: **URS CORPORATION LTD**

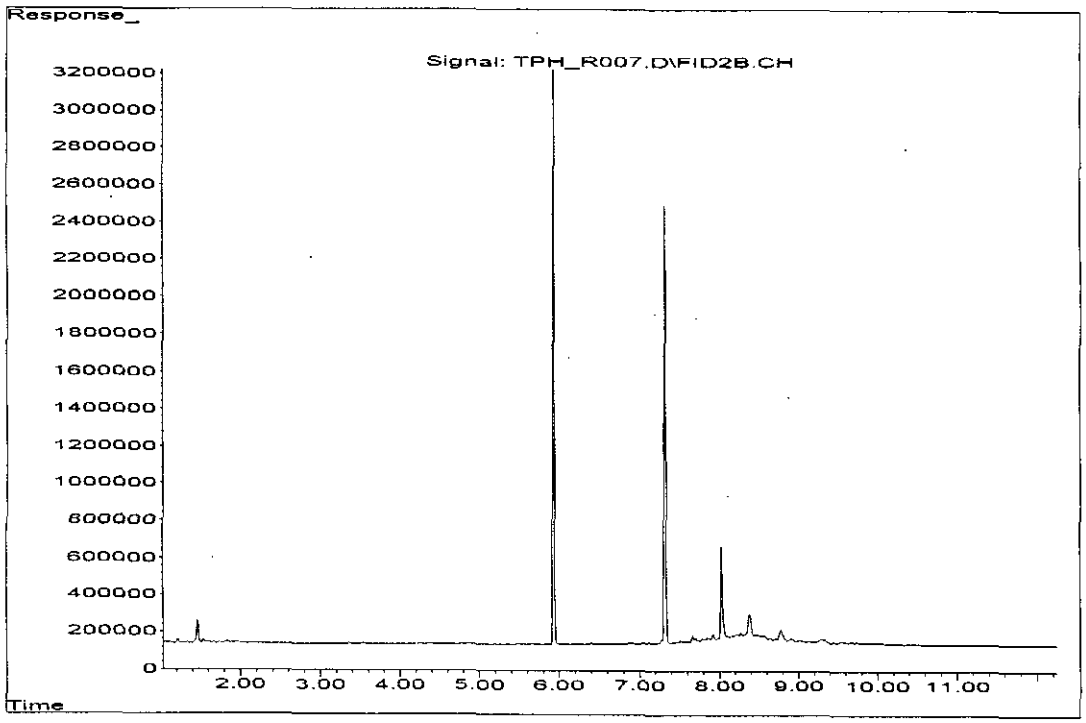
| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373242 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | QC BLK 126812 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | | |
| Weight(g): | 5 | | |
| Dilution Factor: | 1 | | |
| Report Date: | 8-Nov-2002 | CONCENTRATION UNITS: | mg/kg |

## RESULTS

| RANGE | MRL | RESULT |
|---|---|---|
| >C6 - C8 | 5 | ND |
| >C8 - C10 | 5 | ND |
| >C10 - C16 | 10 | ND |
| >C16 - C24 | 10 | ND |
| >C24 - C40 | 25 | 48 |
| **TOTAL TPH >C6 - C40** | | **48** |

MRL = MINIMUM REPORTING LIMIT
*ND = NOT DETECTED*

## CHROMATOGRAM




SEVERN TRENT STL
Environmental Leadership

# TOTAL PETROLEUM HYDROCARBONS

*Client Name:* **URS CORPORATION LTD**

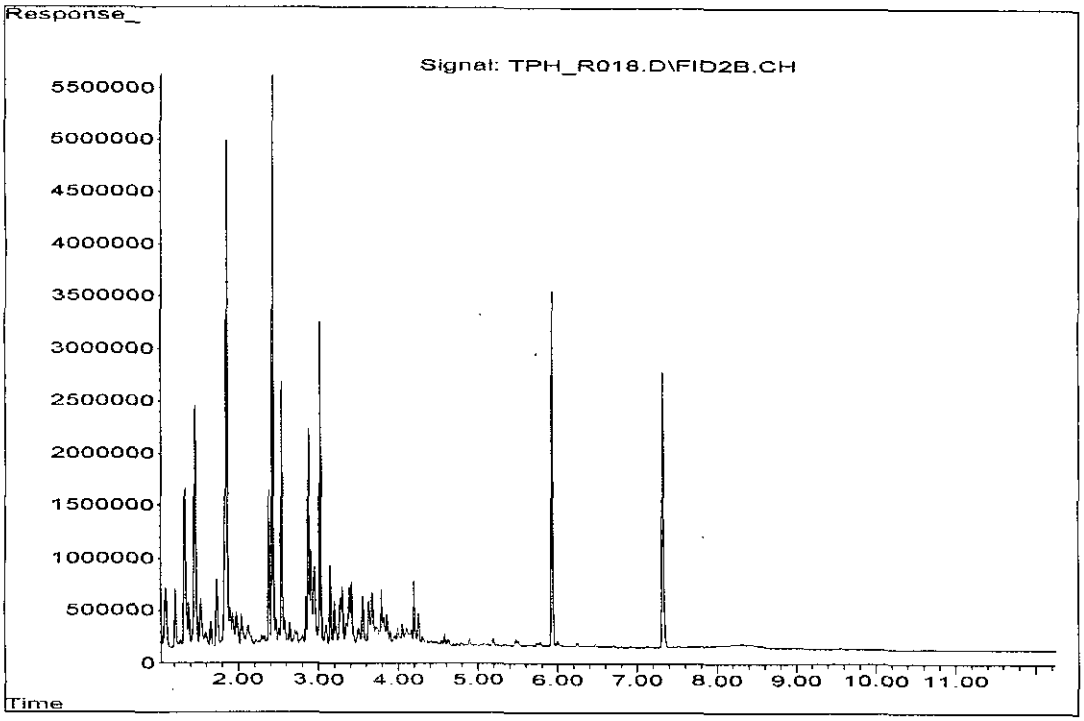
| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373243 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 1 -2.0 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | | |
| Weight(g): | 4.97 | | |
| Dilution Factor: | 1 | | |
| Report Date: | 8-Nov-2002 | CONCENTRATION UNITS: | mg/kg |

## RESULTS

| RANGE | MRL | RESULT |
|---|---|---|
| >C6 - C8 | 5 | 215 |
| >C8 - C10 | 5 | 306 |
| >C10 - C16 | 10 | 220 |
| >C16 - C24 | 10 | 39 |
| >C24 - C40 | 25 | ND |
| **TOTAL TPH >C6 - C40** | | **781** |

MRL = MINIMUM REPORTING LIMIT
ND = NOT DETECTED

## CHROMATOGRAM




SEVERN TRENT
Environmental Leadership
STL

# TOTAL PETROLEUM HYDROCARBONS

Client Name: **URS CORPORATION LTD**

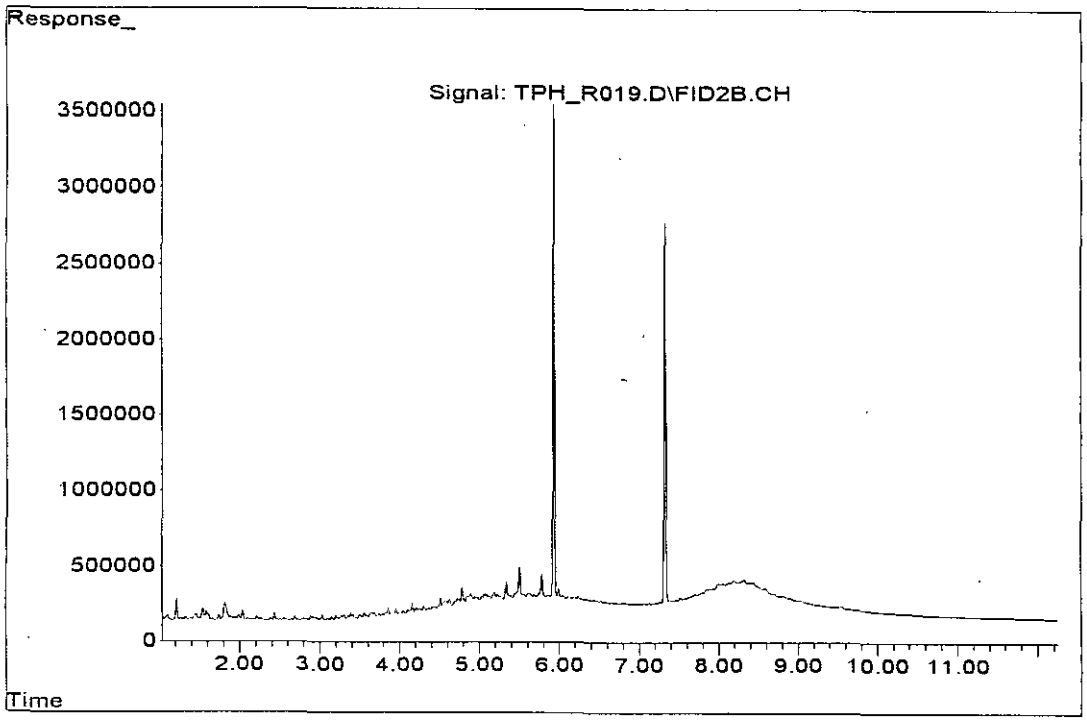
| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373244 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | *NONE SUPPLIED* | Quant. Type: | ISTD |
| Client Sample ID: | UST 2 -1.0 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | | |
| Weight(g): | 4.96 | | |
| Dilution Factor: | 1 | | |
| Report Date: | 8-Nov-2002 | CONCENTRATION UNITS: mg/kg | |

## RESULTS

| RANGE | MRL | RESULT |
|---|---|---|
| >C6 - C8 | 5 | ND |
| >C8 - C10 | 5 | ND |
| >C10 - C16 | 10 | 121 |
| >C16 - C24 | 10 | 197 |
| >C24 - C40 | 25 | 276 |
| **TOTAL TPH >C6 - C40** | | **593** |

MRL = MINIMUM REPORTING LIMIT
ND = NOT DETECTED

## CHROMATOGRAM




SEVERN TRENT STL
Environmental Leadership

# TOTAL PETROLEUM HYDROCARBONS

Client Name: **URS CORPORATION LTD**

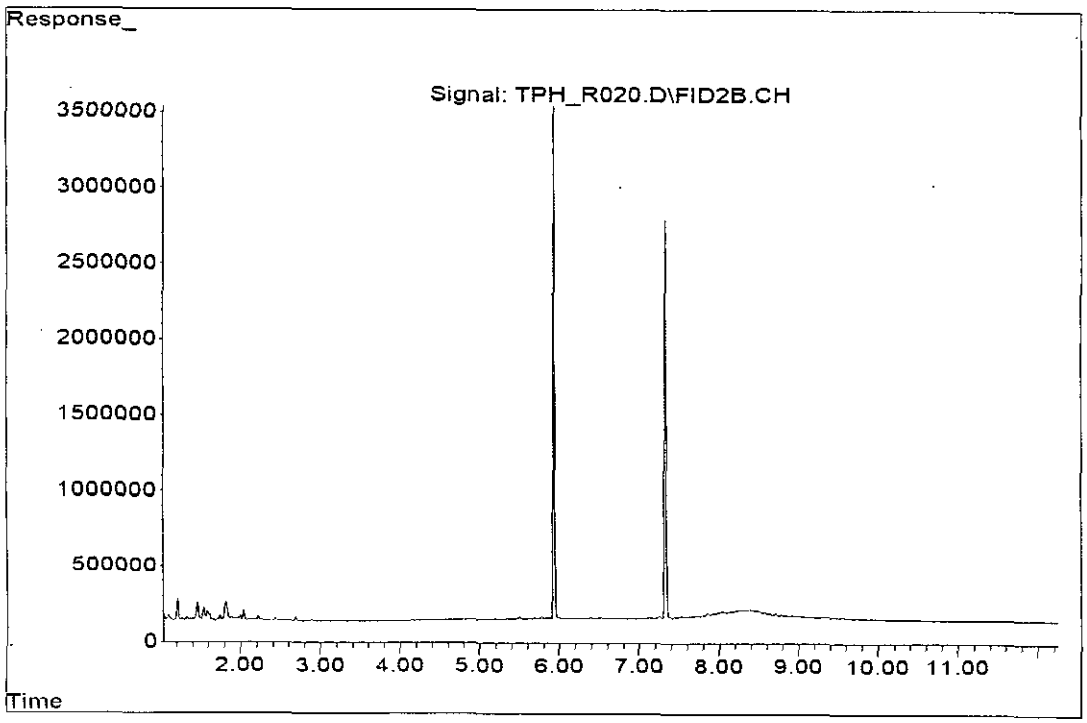
| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373245 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 3 -2.0 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | | |
| Weight(g): | 4.99 | | |
| Dilution Factor: | 1 | | |
| Report Date: | 8-Nov-2002 | CONCENTRATION UNITS: | mg/kg |

## RESULTS

| RANGE | MRL | RESULT |
|---|---|---|
| >C6 - C8 | 5 | ND |
| >C8 - C10 | 5 | ND |
| >C10 - C16 | 10 | ND |
| >C16 - C24 | 10 | 23 |
| >C24 - C40 | 25 | 54 |
| **TOTAL TPH >C6 - C40** | | **77** |

MRL = MINIMUM REPORTING LIMIT
ND = NOT DETECTED

## CHROMATOGRAM




SEVERN TRENT STL
Environmental Leadership

# TOTAL PETROLEUM HYDROCARBONS

Client Name: **URS CORPORATION LTD**

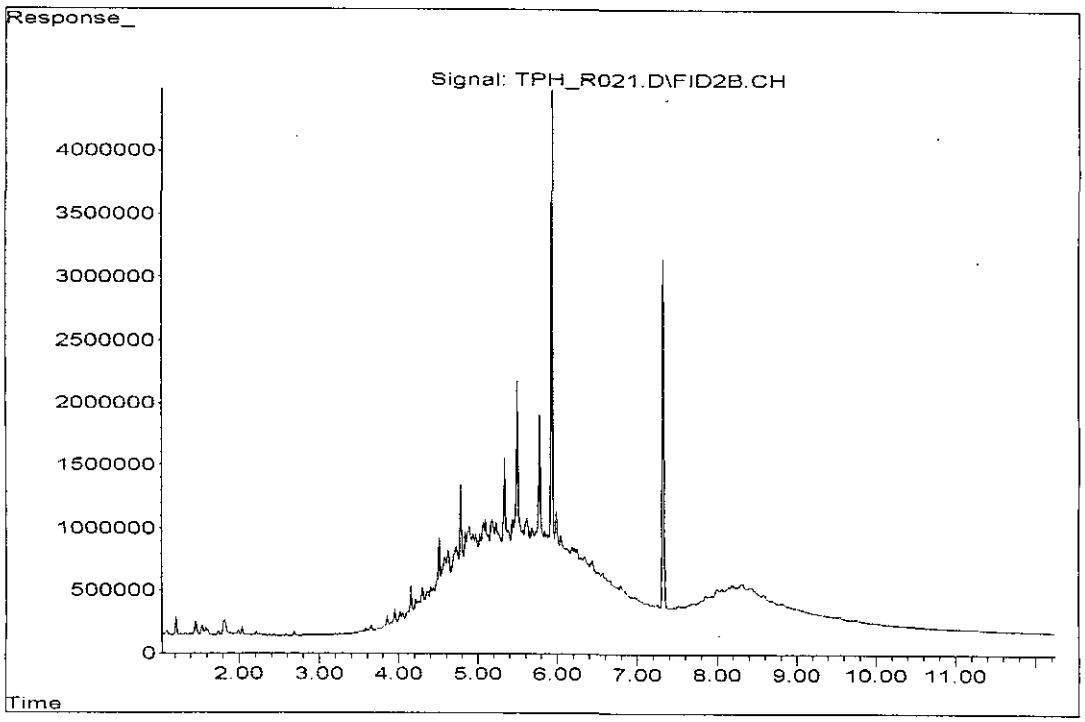
| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373246 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 4 -0.5 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | | |
| Weight(g): | 4.93 | | |
| Dilution Factor: | 1 | | |
| Report Date: | 8-Nov-2002 | CONCENTRATION UNITS: mg/kg | |

## RESULTS

| RANGE | MRL | RESULT |
|---|---|---|
| >C6 - C8 | 5 | ND |
| >C8 - C10 | 5 | ND |
| >C10 - C16 | 10 | 521 |
| >C16 - C24 | 10 | 940 |
| >C24 - C40 | 25 | 420 |
| **TOTAL TPH >C6 - C40** | | **1880** |

MRL = MINIMUM REPORTING LIMIT
ND = NOT DETECTED

## CHROMATOGRAM




SEVERN TRENT STL
Environmental Leadership

# TOTAL PETROLEUM HYDROCARBONS

Client Name: **URS CORPORATION LTD**

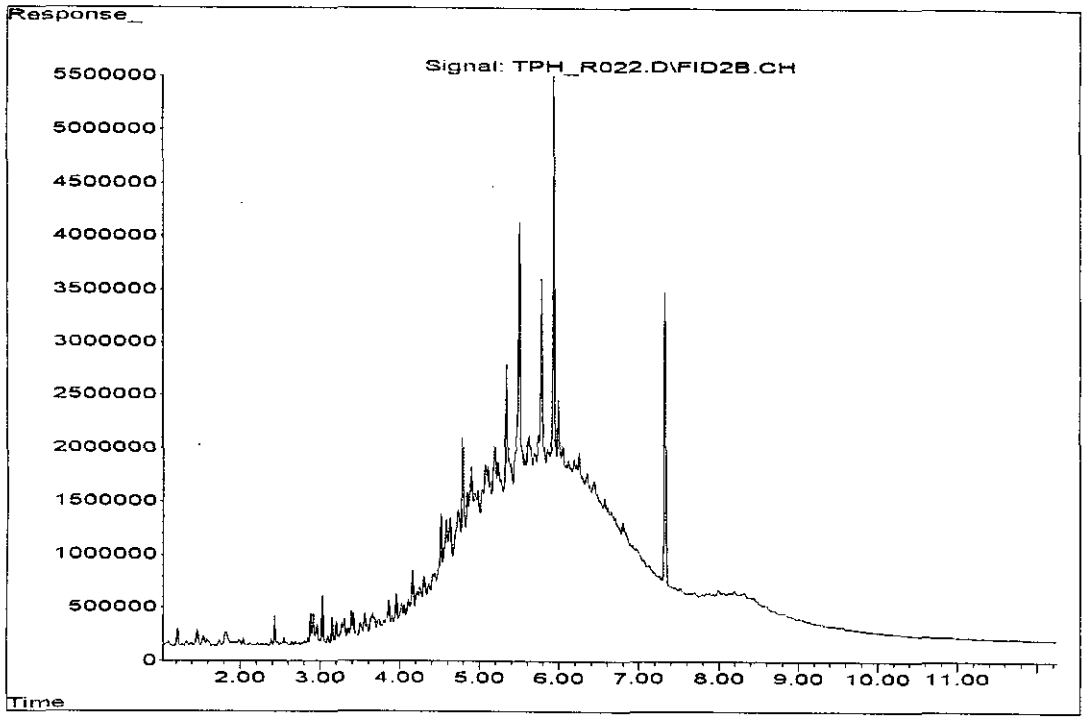
| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373247 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 5 -0.8 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | | |
| Weight(g): | 5 | | |
| Dilution Factor: | 1 | | |
| Report Date: | 8-Nov-2002 | CONCENTRATION UNITS: | mg/kg |

## RESULTS

| RANGE | MRL | RESULT |
|---|---|---|
| >C6 - C8 | 5 | 6 |
| >C8 - C10 | 5 | 33 |
| >C10 - C16 | 10 | 981 |
| >C16 - C24 | 10 | 2170 |
| >C24 - C40 | 25 | 607 |
| **TOTAL TPH >C6 - C40** | | **3800** |

MRL = MINIMUM REPORTING LIMIT
ND = NOT DETECTED

## CHROMATOGRAM




SEVERN TRENT STL
Environmental Leadership

# TOTAL PETROLEUM HYDROCARBONS

Client Name: URS CORPORATION LTD

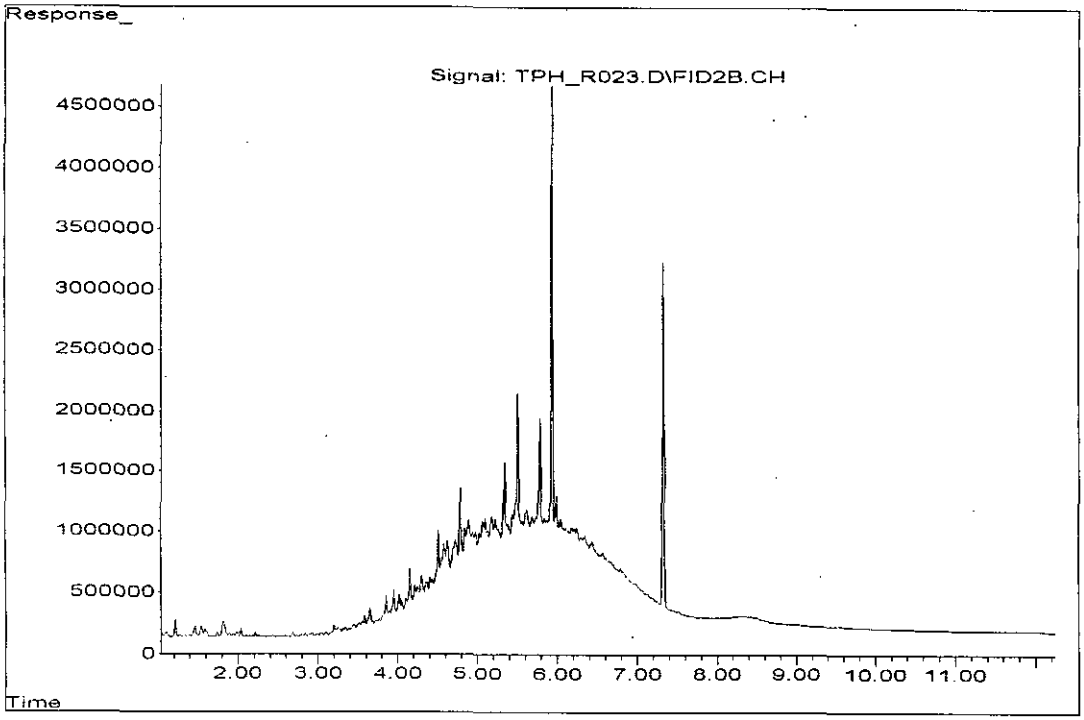
| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373248 | Method: | IN HOUSE |
| Job No.: | 165099 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 6 -2.0 | Accreditation Status: | NONE |
| Sample Matrix: | SOLID | | |
| Weight(g): | 4.94 | | |
| Dilution Factor: | 1 | | |
| Report Date: | 8-Nov-2002 | CONCENTRATION UNITS: | mg/kg |

## RESULTS

| RANGE | MRL | RESULT |
|---|---|---|
| >C6 - C8 | 5 | ND |
| >C8 - C10 | 5 | 6 |
| >C10 - C16 | 10 | 636 |
| >C16 - C24 | 10 | 1130 |
| >C24 - C40 | 25 | 201 |
| **TOTAL TPH >C6 - C40** | | **1970** |

MRL = MINIMUM REPORTING LIMIT
ND = NOT DETECTED

## CHROMATOGRAM




SEVERN TRENT STL
Environmental Leadership

# VOLATILE ORGANIC COMPOUNDS IN SOLIDS

| | | | |
|---|---|---|---|
| Client Name | : **URS Corporation Limited** | Method | : EPA 8260 MODIFIED |
| Lab Sample ID | : 373241 | Data Type | : MS DATA |
| Job No | : 165099 | Data Path | : D:\1V-DATA\NOV02\1V051102\ |
| Sample Location | : URS Dames & Moore | Quant Type | : ISTD |
| Client Sample ID | : AQC SPIKE | Accreditation Status | : UKAS |
| Sample Matrix | : SOIL | Dilution Factor | : 1 |
| Vial No | : 15 | Report Date | : 08/11/2002 |

| CAS NO | Compound | MRL | Result | Flags |
|---|---|---|---|---|
| 75-71-8 | Dichlorodifluoromethane ug/kg | 5 | ND | |
| 74-87-3 | Chloromethane ug/kg | 5 | ND | |
| 75-00-3 | Chloroethane ug/kg | 5 | ND | |
| 74-83-9 | Bromomethane ug/kg | 5 | ND | |
| 75-69-4 | Trichlorofluoromethane ug/kg | 5 | ND | |
| 75-35-4 | 1,1-Dichloroethene ug/kg | 5 | 44.1 | |
| 75-09-2 | Dichloromethane ug/kg | 5 | ND | |
| 156-60-9 | Trans-1,2-dichloroethene ug/kg | 5 | ND | |
| 75-34-3 | 1,1-Dichloroethane ug/kg | 5 | ND | |
| 156-59-2 | Cis-1,2-dichloroethene ug/kg | 5 | ND | |
| 594-20-7 | 2,2-Dichloropropane ug/kg | 5 | ND | |
| 67-66-3 | Chloroform ug/kg | 5 | ND | |
| 74-97-5 | Bromochloromethane ug/kg | 5 | ND | |
| 71-55-6 | 1,1,1-Trichloroethane ug/kg | 5 | ND | |
| 563-58-6 | 1,1-Dichloropropene ug/kg | 5 | ND | |
| 107-06-2 | 1,2-Dichloroethane ug/kg | 5 | ND | |
| 71-43-2 | Benzene ug/kg | 5 | 45.0 | |
| 78-87-5 | 1,2-Dichloropropane ug/kg | 5 | ND | |
| 79-01-6 | Trichloroethene ug/kg | 5 | 43.8 | |
| 75-27-4 | Bromodichloromethane ug/kg | 5 | ND | |
| 74-95-3 | Dibromomethane ug/kg | 5 | ND | |
| 10061-01-5 | Cis-1,3-dichloropropene ug/kg | 5 | ND | |
| 108-88-3 | Toluene ug/kg | 5 | 42.3 | |
| 10061-02-6 | Trans-1,3-dichloropropene ug/kg | 5 | ND | |
| 79-00-5 | 1,1,2-trichloroethane ug/kg | 5 | ND | |
| 56-23-5 | Carbon Tetrachloride ug/kg | 5 | ND | |
| 75-01-4 | Vinyl Chloride ug/kg | 5 | ND | |
| 124-28-9 | 1,3-dichloropropane ug/kg | 5 | ND | |
| 127-18-4 | Tetrachloroethene ug/kg | 5 | ND | |
| 124-48-1 | Dibromochloromethane ug/kg | 5 | ND | |
| 106-93-4 | 1,2-dibromoethane ug/kg | 5 | ND | |
| 108-90-7 | Chlorobenzene ug/kg | 5 | 41.4 | |
| 630-20-6 | 1,1,1,2-tetrachloroethane ug/kg | 5 | ND | |
| 100-41-4 | Ethylbenzene ug/kg | 5 | ND | |
| 1330-20-7 | m,p-xylene ug/kg | 10 | ND | |

SEVERN TRENT STL
Environmental Leadership

## VOLATILE ORGANIC COMPOUNDS IN SOLIDS

| | | | |
|---|---|---|---|
| Client Name | : **URS Corporation Limited** | Method | : EPA 8260 MODIFIED |
| Lab Sample ID | : 373241 | Data Type | : MS DATA |
| Job No | : 165099 | Data Path | : D:\1V-DATA\NOV02\1V051102\ |
| Sample Location | : URS Dames & Moore | Quant Type | : ISTD |
| Client Sample ID | : AQC SPIKE | Accreditation Status | : UKAS |
| Sample Matrix | : SOIL | Dilution Factor | : 1 |
| Vial No | : 15 | Report Date | : 08/11/2002 |

| CAS NO | Compound | MRL | Result | | Flags |
|---|---|---|---|---|---|
| 95-47-6 | o-xylene ug/kg | 5 | ND | | |
| 100-42-5 | Styrene ug/kg | 5 | ND | | |
| 75-25-2 | Bromoform ug/kg | 5 | ND | | |
| 98-82-8 | Isopropylbenzene ug/kg | 5 | ND | | |
| 79-34-5 | 1,1,2,2-tetrachloroethane ug/kg | 5 | ND | | |
| 96-18-4 | 1,2,3-trichloropropane ug/kg | 5 | ND | | |
| 103-65-1 | n-propylbenzene ug/kg | 5 | ND | | |
| 108-86-1 | Bromobenzene ug/kg | 5 | ND | | |
| 95-49-8 | 2-chlorotoluene ug/kg | 5 | ND | | |
| 108-67-8 | 1,3,5-trimethylbenzene ug/kg | 5 | ND | | |
| 106-43-4 | 4-chlorotoluene ug/kg | 5 | ND | | |
| 98-06-6 | tert-butylbenzene ug/kg | 5 | ND | | |
| 95-63-6 | 1,2,4-trimethylbenzene ug/kg | 5 | ND | | |
| 135-98-8 | sec-butylbenzene ug/kg | 5 | ND | | |
| 99-87-6 | p-isopropyltoluene ug/kg | 5 | ND | | |
| 541-73-1 | 1,3-dichlorobenzene ug/kg | 5 | ND | | |
| 106-46-7 | 1,4-dichlorobenzene ug/kg | 5 | ND | | |
| 104-51-8 | n-butylbenzene ug/kg | 5 | ND | | |
| 95-50-1 | 1,2-dichlorobenzene ug/kg | 5 | ND | | |
| 96-12-8 | 1,2-dibromo-3-chloropropane ug/kg | 5 | ND | | |
| 120-82-1 | 1,2,4-trichlorobenzene ug/kg | 5 | ND | | |
| 87-68-3 | Hexachlorobutadiene ug/kg | 5 | ND | | |
| 91-20-3 | Naphthalene ug/kg | 5 | ND | | |
| 87-61-6 | 1,2,3-trichlorobenzene ug/kg | 5 | ND | | |
| Surrogate | Dibromofluoromethane %Recovered | | 97.9 | Pass | |
| Surrogate | Toluene-d8 %Recovered | | 102.3 | Pass | |
| Surrogate | 4-bromofluorobenzene %Recovered | | 104.5 | Pass | |



SEVERN TRENT STL
Environmental Leadership

# VOLATILE ORGANIC COMPOUNDS IN SOLIDS

| | | | |
|---|---|---|---|
| Client Name | : **URS Corporation Limited** | Method | : EPA 8260 MODIFIED |
| Lab Sample ID | : 373242 | Data Type | : MS DATA |
| Job No | : 165099 | Data Path | : D:\1V-DATA\NOV02\1V051102\ |
| Sample Location | : URS Dames & Moore | Quant Type | : ISTD |
| Client Sample ID | : AQC BLANK | Accreditation Status | : UKAS |
| Sample Matrix | : SOIL | Dilution Factor | : 1 |
| Vial No | : 14 | Report Date | : 08/11/2002 |

| CAS NO | Compound | MRL | Result | Flags |
|---|---|---|---|---|
| 75-71-8 | Dichlorodifluoromethane ug/kg | 5 | ND | |
| 74-87-3 | Chloromethane ug/kg | 5 | ND | |
| 75-00-3 | Chloroethane ug/kg | 5 | ND | |
| 74-83-9 | Bromomethane ug/kg | 5 | ND | |
| 75-69-4 | Trichlorofluoromethane ug/kg | 5 | ND | |
| 75-35-4 | 1,1-Dichloroethene ug/kg | 5 | ND | |
| 75-09-2 | Dichloromethane ug/kg | 5 | ND | |
| 156-60-9 | Trans-1,2-dichloroethene ug/kg | 5 | ND | |
| 75-34-3 | 1,1-Dichloroethane ug/kg | 5 | ND | |
| 156-59-2 | Cis-1,2-dichloroethene ug/kg | 5 | ND | |
| 594-20-7 | 2,2-Dichloropropane ug/kg | 5 | ND | |
| 67-66-3 | Chloroform ug/kg | 5 | ND | |
| 74-97-5 | Bromochloromethane ug/kg | 5 | ND | |
| 71-55-6 | 1,1,1-Trichloroethane ug/kg | 5 | ND | |
| 563-58-6 | 1,1-Dichloropropene ug/kg | 5 | ND | |
| 107-06-2 | 1,2-Dichloroethane ug/kg | 5 | ND | |
| 71-43-2 | Benzene ug/kg | 5 | ND | |
| 78-87-5 | 1,2-Dichloropropane ug/kg | 5 | ND | |
| 79-01-6 | Trichloroethene ug/kg | 5 | ND | |
| 75-27-4 | Bromodichloromethane ug/kg | 5 | ND | |
| 74-95-3 | Dibromomethane ug/kg | 5 | ND | |
| 10061-01-5 | Cis-1,3-dichloropropene ug/kg | 5 | ND | |
| 108-88-3 | Toluene ug/kg | 5 | ND | |
| 10061-02-6 | Trans-1,3-dichloropropene ug/kg | 5 | ND | |
| 79-00-5 | 1,1,2-trichloroethane ug/kg | 5 | ND | |
| 56-23-5 | Carbon Tetrachloride ug/kg | 5 | ND | |
| 75-01-4 | Vinyl Chloride ug/kg | 5 | ND | |
| 124-28-9 | 1,3-dichloropropane ug/kg | 5 | ND | |
| 127-18-4 | Tetrachloroethene ug/kg | 5 | ND | |
| 124-48-1 | Dibromochloromethane ug/kg | 5 | ND | |
| 106-93-4 | 1,2-dibromoethane ug/kg | 5 | ND | |
| 108-90-7 | Chlorobenzene ug/kg | 5 | ND | |
| 630-20-6 | 1,1,1,2-tetrachloroethane ug/kg | 5 | ND | |
| 100-41-4 | Ethylbenzene ug/kg | 5 | ND | |
| 1330-20-7 | m,p-xylene ug/kg | 10 | ND | |
| 95-47-6 | o-xylene ug/kg | 5 | ND | |



SEVERN TRENT STL
Environmental Leadership

## VOLATILE ORGANIC COMPOUNDS IN SOLIDS

| | | | |
|---|---|---|---|
| Client Name | : **URS Corporation Limited** | Method | : EPA 8260 MODIFIED |
| Lab Sample ID | : 373242 | Data Type | : MS DATA |
| Job No | : 165099 | Data Path | : D:\1V-DATA\NOV02\1V051102\ |
| Sample Location | : URS Dames & Moore | Quant Type | : ISTD |
| Client Sample ID | : AQC BLANK | Accreditation Status | : UKAS |
| Sample Matrix | : SOIL | Dilution Factor | : 1 |
| Vial No | : 14 | Report Date | : 08/11/2002 |

| CAS NO | Compound | MRL | Result | | Flags |
|---|---|---|---|---|---|
| 100-42-5 | Styrene ug/kg | 5 | ND | | |
| 75-25-2 | Bromoform ug/kg | 5 | ND | | |
| 98-82-8 | Isopropylbenzene ug/kg | 5 | ND | | |
| 79-34-5 | 1,1,2,2-tetrachloroethane ug/kg | 5 | ND | | |
| 96-18-4 | 1,2,3-trichloropropane ug/kg | 5 | ND | | |
| 103-65-1 | n-propylbenzene ug/kg | 5 | ND | | |
| 108-86-1 | Bromobenzene ug/kg | 5 | ND | | |
| 95-49-8 | 2-chlorotoluene ug/kg | 5 | ND | | |
| 108-67-8 | 1,3,5-trimethylbenzene ug/kg | 5 | ND | | |
| 106-43-4 | 4-chlorotoluene ug/kg | 5 | ND | | |
| 98-06-6 | tert-butylbenzene ug/kg | 5 | ND | | |
| 95-63-6 | 1,2,4-trimethylbenzene ug/kg | 5 | ND | | |
| 135-98-8 | sec-butylbenzene ug/kg | 5 | ND | | |
| 99-87-6 | p-isopropyltoluene ug/kg | 5 | ND | | |
| 541-73-1 | 1,3-dichlorobenzene ug/kg | 5 | ND | | |
| 106-46-7 | 1,4-dichlorobenzene ug/kg | 5 | ND | | |
| 104-51-8 | n-butylbenzene ug/kg | 5 | ND | | |
| 95-50-1 | 1,2-dichlorobenzene ug/kg | 5 | ND | | |
| 96-12-8 | 1,2-dibromo-3-chloropropane ug/kg | 5 | ND | | |
| 120-82-1 | 1,2,4-trichlorobenzene ug/kg | 5 | ND | | |
| 87-68-3 | Hexachlorobutadiene ug/kg | 5 | ND | | |
| 91-20-3 | Naphthalene ug/kg | 5 | ND | | |
| 87-61-6 | 1,2,3-trichlorobenzene ug/kg | 5 | ND | | |
| Surrogate | Dibromofluoromethane %Recovered | | 97.5 | Pass | |
| Surrogate | Toluene-d8 %Recovered | | 102.2 | Pass | |
| Surrogate | 4-bromofluorobenzene %Recovered | | 100.5 | Pass | |



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Environmental Leadership

## VOLATILE ORGANIC COMPOUNDS IN SOLIDS

| | | | |
|---|---|---|---|
| Client Name | : **URS Corporation Limited** | Method | : EPA 8260 MODIFIED |
| Lab Sample ID | : 373243 | Data Type | : MS DATA |
| Job No | : 165099 | Data Path | : D:\1V-DATA\NOV02\1V051102\ |
| Sample Location | : URS Dames & Moore | Quant Type | : ISTD |
| Client Sample ID | : UST 1 -2.0 | Accreditation Status | : UKAS |
| Sample Matrix | : SOIL | Dilution Factor | : 1 |
| Vial No | : 7 | Report Date | : 08/11/2002 |

| CAS NO | Compound | MRL | Result | Flags |
|---|---|---|---|---|
| 71-43-2 | Benzene ug/kg | 5 | ND | |
| 108-88-3 | Toluene ug/kg | 5 | ND | |
| 100-41-4 | Ethylbenzene ug/kg | 5 | ND | |
| 1330-20-7 | m,p-xylene ug/kg | 10 | ND | |
| 95-47-6 | o-xylene ug/kg | 5 | ND | |
| Surrogate | Toluene-d8 %Recovered | | 97.5 Pass | |



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Environmental Leadership

# GASOLINE RANGE ORGANIC COMPOUNDS

Client Name: **URS CORPORATION LIMITED**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 373243 | Method: | EPA 8260 MODIFIED |
| Job No: | 165099 | Data Type: | MS DATA |
| Sample Location: | NONE SUPPLIED | Quant Type: | ISTD |
| Client sample ID: | UST 1-2.0 | Accreditation Status: | UKAS |
| Sample Matrix: | SOIL | MRL Specified is MDL x10 | |
| Dilution Factor: | 1 | | |
| REPORT DATE: | 11-Nov-02 | CONCENTRATION UNITS: ug/kg | |

| COMPOUND | MRL | RESULT |
|---|---|---|
| GASOLINE RANGE ORGANICS | 5 | 158 |

**NOTES**

MRL - MINIMUM REPORTING LIMIT

## RECOVERY OF SURROGATE COMPOUNDS

| SURROGATE COMPOUND | ADDED ug/kg | RECOVERED ug/kg | % RECOVERED | LIMITS LOW | LIMITS HIGH | |
|---|---|---|---|---|---|---|
| Dibromofluoromethane | 50 | 52.27 | 104.5 | 75 | 125 | PASS |
| Toluene-d8 | 50 | 48.76 | 97.5 | 75 | 125 | PASS |
| 4-Bromofluorobenzene | 50 | 51.74 | 103.5 | 75 | 125 | PASS |

# VOLATILE ORGANIC COMPOUNDS IN SOLIDS

| | | | |
|---|---|---|---|
| Client Name | : **URS Corporation Limited** | Method | : EPA 8260 MODIFIED |
| Lab Sample ID | : 373244 | Data Type | : MS DATA |
| Job No | : 165099 | Data Path | : D:\1V-DATA\NOV02\1V051102\ |
| Sample Location | : URS Dames & Moore | Quant Type | : ISTD |
| Client Sample ID | : UST 2 -1.0 | Accreditation Status | : UKAS |
| Sample Matrix | : SOIL | Dilution Factor | : 1 |
| Vial No | : 8 | Report Date | : 08/11/2002 |

| CAS NO | Compound | MRL | Result | | Flags |
|---|---|---|---|---|---|
| 71-43-2 | Benzene ug/kg | 5 | ND | | |
| 108-88-3 | Toluene ug/kg | 5 | ND | | |
| 100-41-4 | Ethylbenzene ug/kg | 5 | ND | | |
| 1330-20-7 | m,p-xylene ug/kg | 10 | ND | | |
| 95-47-6 | o-xylene ug/kg | 5 | ND | | |
| Surrogate | Toluene-d8 %Recovered | | 97.9 | Pass | |



SEVERN TRENT STL
Environmental Leadership

# GASOLINE RANGE ORGANIC COMPOUNDS

Client Name: **URS CORPORATION LIMITED**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 373244 | Method: | EPA 8260 MODIFIED |
| Job No: | 165099 | Data Type: | MS DATA |
| Sample Location: | NONE SUPPLIED | Quant Type: | ISTD |
| Client sample ID: | UST 2-1.0 | Accreditation Status: | UKAS |
| Sample Matrix: | SOIL | MRL Specified is MDL x10 | |
| Dilution Factor: | 1 | | |
| REPORT DATE: | 11-Nov-02 | CONCENTRATION UNITS: | ug/kg |

| COMPOUND | MRL | RESULT |
|---|---|---|
| GASOLINE RANGE ORGANICS | 5 | ND |

**NOTES**

MRL - MINIMUM REPORTING LIMIT

## RECOVERY OF SURROGATE COMPOUNDS

| SURROGATE COMPOUND | ADDED ug/kg | RECOVERED ug/kg | % RECOVERED | LIMITS LOW | LIMITS HIGH | |
|---|---|---|---|---|---|---|
| Dibromofluoromethane | 50 | 54.17 | 108.3 | 75 | 125 | PASS |
| Toluene-d8 | 50 | 48.97 | 97.9 | 75 | 125 | PASS |
| 4-Bromofluorobenzene | 50 | 49.84 | 99.7 | 75 | 125 | PASS |

# VOLATILE ORGANIC COMPOUNDS IN SOLIDS

| | | | |
|---|---|---|---|
| Client Name | : **URS Corporation Limited** | Method | : EPA 8260 MODIFIED |
| Lab Sample ID | : 373245 | Data Type | : MS DATA |
| Job No | : 165099 | Data Path | : D:\1V-DATA\NOV02\1V051102\ |
| Sample Location | : URS Dames & Moore | Quant Type | : ISTD |
| Client Sample ID | : UST 3 -2.0 | Accreditation Status | : UKAS |
| Sample Matrix | : SOIL | Dilution Factor | : 1 |
| Vial No | : 9 | Report Date | : 08/11/2002 |

| CAS NO | Compound | MRL | Result | | Flags |
|---|---|---|---|---|---|
| 71-43-2 | Benzene ug/kg | 5 | ND | | |
| 108-88-3 | Toluene ug/kg | 5 | ND | | |
| 100-41-4 | Ethylbenzene ug/kg | 5 | ND | | |
| 1330-20-7 | m,p-xylene ug/kg | 10 | ND | | |
| 95-47-6 | o-xylene ug/kg | 5 | ND | | |
| Surrogate | Toluene-d8 %Recovered | | 100.4 | Pass | |



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# GASOLINE RANGE ORGANIC COMPOUNDS

Client Name: **URS CORPORATION LIMITED**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 373245 | Method: | EPA 8260 MODIFIED |
| Job No: | 165099 | Data Type: | MS DATA |
| Sample Location: | NONE SUPPLIED | Quant Type: | ISTD |
| Client sample ID: | UST 3-2.0 | Accreditation Status: | UKAS |
| Sample Matrix: | SOIL | MRL Specified is MDL x10 | |
| Dilution Factor: | 1 | | |
| REPORT DATE: | 11-Nov-02 | CONCENTRATION UNITS: ug/kg | |

| COMPOUND | MRL | RESULT |
|---|---|---|
| GASOLINE RANGE ORGANICS | 5 | ND |

**NOTES**

MRL - MINIMUM REPORTING LIMIT

## RECOVERY OF SURROGATE COMPOUNDS

| SURROGATE COMPOUND | ADDED ug/kg | RECOVERED ug/kg | % RECOVERED | LIMITS LOW | LIMITS HIGH | |
|---|---|---|---|---|---|---|
| Dibromofluoromethane | 50 | 52.47 | 104.9 | 75 | 125 | PASS |
| Toluene-d8 | 50 | 50.18 | 100.4 | 75 | 125 | PASS |
| 4-Bromofluorobenzene | 50 | 51.33 | 102.7 | 75 | 125 | PASS |

## VOLATILE ORGANIC COMPOUNDS IN SOLIDS

| | | | |
|---|---|---|---|
| Client Name | : **URS Corporation Limited** | Method | : EPA 8260 MODIFIED |
| Lab Sample ID | : 373246 | Data Type | : MS DATA |
| Job No | : 165099 | Data Path | : D:\1V-DATA\NOV02\1V051102\ |
| Sample Location | : URS Dames & Moore | Quant Type | : ISTD |
| Client Sample ID | : UST 4 -0.5 | Accreditation Status | : UKAS |
| Sample Matrix | : SOIL | Dilution Factor | : 1 |
| Vial No | : 13 | Report Date | : 08/11/2002 |

| CAS NO | Compound | MRL | Result | | Flags |
|---|---|---|---|---|---|
| 71-43-2 | Benzene ug/kg | 5 | ND | | |
| 108-88-3 | Toluene ug/kg | 5 | ND | | |
| 100-41-4 | Ethylbenzene ug/kg | 5 | ND | | |
| 1330-20-7 | m,p-xylene ug/kg | 10 | ND | | |
| 95-47-6 | o-xylene ug/kg | 5 | ND | | |
| Surrogate | Toluene-d8 %Recovered | | 99.9 | Pass | |



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# GASOLINE RANGE ORGANIC COMPOUNDS

Client Name: **URS CORPORATION LIMITED**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 373246 | Method: | EPA 8260 MODIFIED |
| Job No: | 165099 | Data Type: | MS DATA |
| Sample Location: | NONE SUPPLIED | Quant Type: | ISTD |
| Client sample ID: | UST 4-0.5 | Accreditation Status: | UKAS |
| Sample Matrix: | SOIL | MRL Specified is MDL x10 | |
| Dilution Factor: | 1 | | |
| REPORT DATE: | 11-Nov-02 | CONCENTRATION UNITS: | ug/kg |

| COMPOUND | MRL | RESULT |
|---|---|---|
| GASOLINE RANGE ORGANICS | 5 | 217 |

**NOTES**

MRL - MINIMUM REPORTING LIMIT

## RECOVERY OF SURROGATE COMPOUNDS

| SURROGATE COMPOUND | ADDED ug/kg | RECOVERED ug/kg | % RECOVERED | LIMITS LOW | LIMITS HIGH | |
|---|---|---|---|---|---|---|
| Dibromofluoromethane | 50 | 53.00 | 106.0 | 75 | 125 | PASS |
| Toluene-d8 | 50 | 49.97 | 99.9 | 75 | 125 | PASS |
| 4-Bromofluorobenzene | 50 | 51.92 | 103.8 | 75 | 125 | PASS |

## VOLATILE ORGANIC COMPOUNDS IN SOLIDS

| | | | |
|---|---|---|---|
| Client Name | : **URS Corporation Limited** | Method | : EPA 8260 MODIFIED |
| Lab Sample ID | : 373247 | Data Type | : MS DATA |
| Job No | : 165099 | Data Path | : D:\1V-DATA\NOV02\1V051102\ |
| Sample Location | : URS Dames & Moore | Quant Type | : ISTD |
| Client Sample ID | : UST 5 -0.8 | Accreditation Status | : UKAS |
| Sample Matrix | : SOIL | Dilution Factor | : 50 |
| Vial No | : 30 | Report Date | : 08/11/2002 |

| CAS NO | Compound | MRL | Result | Flags |
|---|---|---|---|---|
| 71-43-2 | Benzene ug/kg | 250 | 540 | |
| 108-88-3 | Toluene ug/kg | 250 | 471 | |
| 100-41-4 | Ethylbenzene ug/kg | 250 | 2380 | |
| 1330-20-7 | m,p-xylene ug/kg | 2000 | 15200 | D |
| 95-47-6 | o-xylene ug/kg | 250 | 2400 | |
| Surrogate | Toluene-d8 %Recovered | | 100.7 Pass | |



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# GASOLINE RANGE ORGANIC COMPOUNDS

Client Name: **URS CORPORATION LIMITED**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 373247 | Method: | EPA 8260 MODIFIED |
| Job No: | 165099 | Data Type: | MS DATA |
| Sample Location: | NONE SUPPLIED | Quant Type: | ISTD |
| Client sample ID: | UST 5-0.8 | Accreditation Status: | UKAS |
| Sample Matrix: | SOIL | MRL Specified is MDL x10 | |
| Dilution Factor: | 200 | | |
| REPORT DATE: | 11-Nov-02 | CONCENTRATION UNITS: ug/kg | |

| COMPOUND | MRL | RESULT |
|---|---|---|
| GASOLINE RANGE ORGANICS | 1000 | 93900 |

**NOTES**

MRL - MINIMUM REPORTING LIMIT

## RECOVERY OF SURROGATE COMPOUNDS

| SURROGATE COMPOUND | ADDED ug/kg | RECOVERED ug/kg | % RECOVERED | LIMITS LOW | LIMITS HIGH | |
|---|---|---|---|---|---|---|
| Dibromofluoromethane | 50 | 47.94 | 95.9 | 75 | 125 | PASS |
| Toluene-d8 | 50 | 50.46 | 100.9 | 75 | 125 | PASS |
| 4-Bromofluorobenzene | 50 | 50.82 | 101.6 | 75 | 125 | PASS |

# VOLATILE ORGANIC COMPOUNDS IN SOLIDS

| | | | |
|---|---|---|---|
| Client Name | : **URS Corporation Limited** | Method | : EPA 8260 MODIFIED |
| Lab Sample ID | : 373248 | Data Type | : MS DATA |
| Job No | : 165099 | Data Path | : D:\1V-DATA\NOV02\1V061102\ |
| Sample Location | : URS Dames & Moore | Quant Type | : ISTD |
| Client Sample ID | : UST 6 -2.0 | Accreditation Status | : UKAS |
| Sample Matrix | : SOIL | Dilution Factor | : 50 |
| Vial No | : 22 | Report Date | : 08/11/2002 |

| CAS NO | Compound | MRL | Result | Flags |
|---|---|---|---|---|
| 71-43-2 | Benzene ug/kg | 250 | ND | |
| 108-88-3 | Toluene ug/kg | 250 | 107 | J |
| 100-41-4 | Ethylbenzene ug/kg | 250 | 127 | J |
| 1330-20-7 | m,p-xylene ug/kg | 500 | 604 | |
| 95-47-6 | o-xylene ug/kg | 250 | 202 | J |
| Surrogate | Toluene-d8 %Recovered | | 100.1 Pass | |

Please note : Result of ND is Not Detectable

For Surrogate Compounds 50 ug/kg added,lower limit is 75% and higher limit is 125%

Explanation of compound flags :

J : Compound is detectable but is below normal reporting limit

E : Result is above the calibrated range and is therefore an estimate

B : Compound also detected in Blank extract

D : Sample was diluted and re-analysed to obtain a valid result for this compound

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# GASOLINE RANGE ORGANIC COMPOUNDS

Client Name: **URS CORPORATION LIMITED**

| | | | |
|---|---|---|---|
| Lab Sample ID: | 373248 | Method: | EPA 8260 MODIFIED |
| Job No: | 165099 | Data Type: | MS DATA |
| Sample Location: | NONE SUPPLIED | Quant Type: | ISTD |
| Client sample ID: | UST 6-2.0 | Accreditation Status: | UKAS |
| Sample Matrix: | SOIL | MRL Specified is MDL x10 | |
| Dilution Factor: | 50 | | |
| REPORT DATE: | 11-Nov-02 | CONCENTRATION UNITS: ug/kg | |

| COMPOUND | MRL | RESULT |
|---|---|---|
| GASOLINE RANGE ORGANICS | 250 | 12400 |

**NOTES**

MRL - MINIMUM REPORTING LIMIT

## RECOVERY OF SURROGATE COMPOUNDS

| SURROGATE COMPOUND | ADDED ug/kg | RECOVERED ug/kg | % RECOVERED | LIMITS LOW | LIMITS HIGH | |
|---|---|---|---|---|---|---|
| Dibromofluoromethane | 50 | 45.39 | 90.8 | 75 | 125 | PASS |
| Toluene-d8 | 50 | 50.77 | 101.5 | 75 | 125 | PASS |
| 4-Bromofluorobenzene | 50 | 53.89 | 107.8 | 75 | 125 | PASS |

SEVERN TRENT STL

Environmental Leadership

***Ms Porter***
***URS Corporation Limited***
***1 Drake Walk***
***Brigantine Place***
***Cardiff CF10 4AN***

11 November 2002

**Test Report : TH /165099/2002**

Dear Ms Porter,

Analysis of your sample(s) submitted on 31/10/02 is now complete and we have pleasure in enclosing the appropriate test report(s).

Should you have any query on the report(s) or any part of our service we will be happy to discuss your requirements.

An invoice for the analysis carried out is included with this report.

Thank you for using STL and we look forward to receiving your next samples.

To arrange a container delivery or sample collection please ring the direct line to **COURIERS on 024 7685 6562.**

Yours Sincerely,

Signed :

Name : J. Fell

Title : Section Manager

UKAS TESTING
1314
0897
1229

INVESTOR IN PEOPLE

ISO 9001 UKAS QUALITY MANAGEMENT
Cert. No. Q6687

ISO 14001 UKAS ENVIRONMENTAL MANAGEMENT
Cert. No. EI0269

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# SALES INVOICE

SEVERN TRENT STL
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**FOR THE ATTENTION OF THE ACCOUNTS DEPARTMENT**

**INVOICE ADDRESS :**

URS Corporation Limited
1 Drake Walk
Brigantine Place

Cardiff

UK
CF10 4AN

**ORDER NO :** C137/JP
**INVOICE NO :** 121213
**INVOICE DATE :** 11/11/02
**CLIENT ACCOUNT :** DA0167
**REPORT NO :** 165099

| QUANTITY | INVOICE DETAILS | UNIT PRICE | AMOUNT |
|---|---|---|---|
| | SAMPLES RECEIVED 31/10/02 | | |
| | REF: 39991 LLANDARCY | | |
| 6 | BTEX | £15.00 | £90.00 |
| 6 | GRO | £20.00 | £120.00 |
| 6 | TPH | £20.00 | £120.00 |
| 1 | CONTAINER DELIVERY 24/10/02 | £20.00 | £20.00 |

**REPORT ADDRESS :**

URS Corporation Limited
1 Drake Walk
Brigantine Place

Cardiff

UK
CF10 4AN

| | |
|---|---|
| **TOTAL BEFORE VAT** | |
| **VAT @ 17.5 %** | **£61.25** |
| **TOTAL AMOUNT PAYABLE** | **£411.25** |

**PAYMENT IS DUE 30 DAYS FROM DATE OF INVOICE**

**Please make all cheques payable to SEVERN TRENT LABORATORIES LTD**

VAT REG NO 486 9855 65

# SEVERN TRENT LABORATORIES LTD

## REGISTRATION DOCUMENT

39991
BPLlandare

| | |
|---|---|
| CUSTOMER | URS |
| CONTACT NAME | Julie Porter |
| TELEPHONE No | 02920465960 |

| | SERVICE USED | DATE | TIME |
|---|---|---|---|
| DELIVERY | | | |
| COLLECTION | | | |

| | | |
|---|---|---|
| FAST TRACK | YES | (NO) |
| AGREED BY | | |
| COMPLETION DATE | 14.11.2 | |

COURIER CHECKED

| | DATE | TIME | INITS |
|---|---|---|---|
| PLES RECEIVED | 31/10/02 | PM | |
| LYSIS CONFIRMED | 31/10/02 | 1 | |
| ISTERED | 01/11/02 | 1455 | ~~ |
| CTRONIC REGISTRATION | | | |
| NSFER TO LIMS | | | |
| NDMENTS | | | |
| HORISED BY | 04/11 | 925 | LF |
| STATUS CONFIRMED | | | |
| FIRMATION LETTER SENT | | | |
| DATED BY | | | |
| ORTED BY | 19/11/02 | 11.45 | AM |
| ORT SAVED | " | " | " |

| | |
|---|---|
| JOB No | 165093 |
| PRE REG JOB No | |
| CUSTOMER CODE | DA067 |
| No OF SAMPLES | 3 |
| SAMPLE No RANGE | 37325-27 |
| PRE REG No RANGE | |
| QUOTE No | |
| ORDER No | C1374/JP |
| PRODUCT CODE | 4L |
| SECTION ID | 241 |
| INVOICE No | 122086 |
| ANALYSIS PRICE | |
| REPORT ISSUE No | ① 19/11/02 |

| | DATE | TIME | INITS |
|---|---|---|---|
| -REGISTERED | | | |
| ROVED BY | | | |

| | | |
|---|---|---|
| SAMPLES SATISFACTORY | YES | NO |

PLE COMMENTS/SPECIAL INSTRUCTIONS

1 x oil type @ £20.00
1 x Risk TPH @ £30.00

**Soil Containers**

| | | | |
|---|---|---|---|
| **Job No** | | **Date Received** | |
| **Initials** | | **Page of** | |

| Sample Description | Container type | Quantity Received | Comments |
|---|---|---|---|
| | 1kg Plastic Pot | | |
| | 2kg Plastic Pot | | |
| | 500ml Glass Jar | | |
| | 120ml Glass Jar | | |
| | BAE Jar | | |
| | Bag | | |
| | Phenol Jar | | |

| Sample Description | Container Type | Quantity Received | Comments |
|---|---|---|---|
| | Clear 1L Glass | | |
| | Brown 1L Glass | | |
| | 1L PET | | |
| | 500ml Metal Bottle | | |
| | VOC Vial | 1 vial. | |
| | Mercury Bottle | | |
| | Monophenol Pot | | |
| | Cyanide Pot | | |
| | Sulphide Pot | | |
| | | | |

| Sample date | Sample description | Determinands | Suites |
|---|---|---|---|
| | VST 6 | 679. GOJ. | |

| Sample date | Sample description | Determinands | Suites |
|---|---|---|---|
| | | | |

| Sample date | Sample description | Determinands | Suites |
|---|---|---|---|
| | | | |

# JOB REPORT 165093

01/11/2002 14:52:57

Description **39991 BPLlandarcy**
Location **39991 BPLlandarcy**

Due date: 14/11/2002 Received date: 31/10/2002 Product Group: 241

R Ms Julie Porter, 1 Drake Walk, Brigantine Place, , Cardiff, , CF10 4AN, 02920 465960, Fax: 02920 465961
I Ms Julie Porter, 1 Drake Walk, Brigantine Place, , Cardiff, , CF10 4AN, 02920 465960, Fax: 02920 465961

***373225 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: AQC SPIKE
Date: 31/10/02 / 1 Function: WA Reason: A2
Completion Date: 14/11/02 Method: 1
6Z9* OIL TYPE TEXT G0J* >C6-40 AL ug/l

***373226 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: AQC BLANK
Date: 31/10/02 / 2 Function: WA Reason: A2
Completion Date: 14/11/02 Method: 1
6Z9* OIL TYPE TEXT G0J* >C6-40 AL ug/l

***373227 01DA0167 URS Dames & Moore*** ***URS Corporation Limited***
Description: UST 6
Date: 31/10/02 / 3 Function: WA Reason: A2
Completion Date: 14/11/02 Method: 1
6Z9* OIL TYPE TEXT G0J* >C6-40 AL ug/l

SEVERN TRENT **STL**

Environmental Leadership

***Ms Porter***
***URS Corporation Limited***
***1 Drake Walk***
***Brigantine Place***
***Cardiff CF10 4AN***

04 November 2002

**Job Reference : TH/165093/2002**

**3 Sample(s) received**

Dear Ms Porter,

The sample(s) submitted on 31/10/2002 are being processed.

Should you have any queries on the above sample(s) please contact Bronya Taylor referring to the above STL Job number reference

Please see the attached job report documents.

Yours Sincerely,

Signed :

Name : pp Bronya Taylor

Title : Senior Customer Services Coordinator

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0897
1229

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ISO 9001 UKAS QUALITY MANAGEMENT
Cert. No.Q6687

ISO 14001 UKAS ENVIRONMENTAL MANAGEMENT
Cert. No. E10269

# TOTAL PETROLEUM HYDROCARBONS

Client Name: **URS CORPORATION LTD**

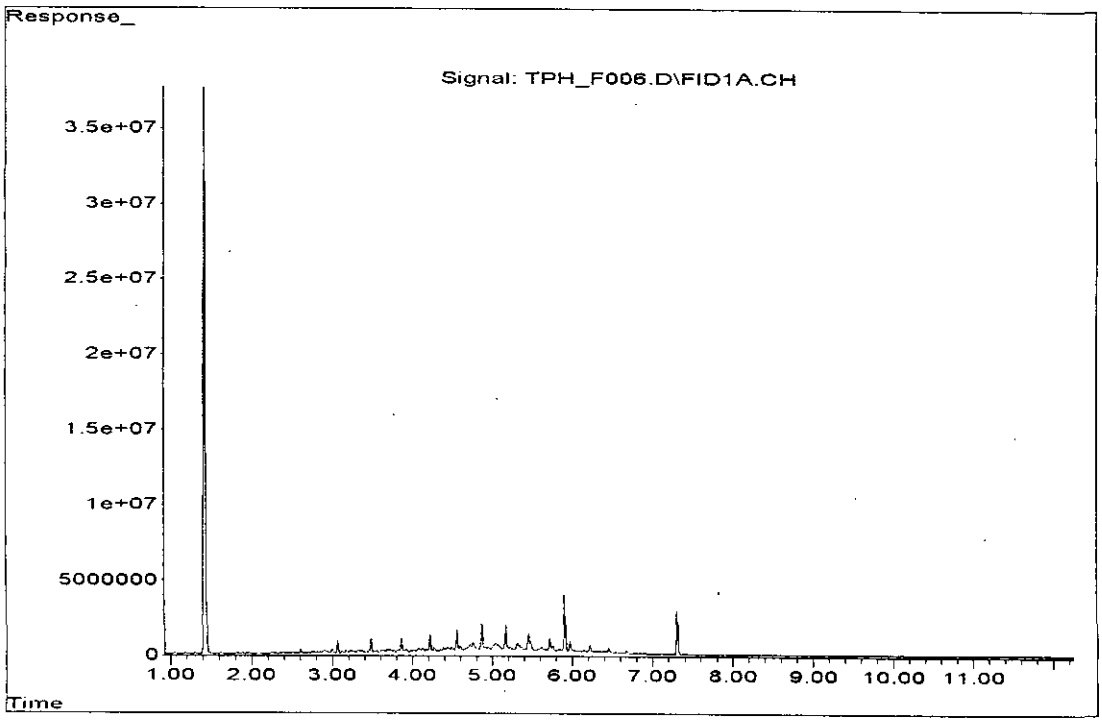
| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373225 | Method: | IN HOUSE |
| Job No.: | 165093 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | QC SPK 126934 | Accreditation Status: | NONE |
| Sample Matrix: | LIQUID | | |
| Vol. Extracted (mls): | 200 | | |
| Dilution Factor: | 1 | | |
| Report Date: | 18-Nov-2002 | CONCENTRATION UNITS: | ug/L |

## RESULTS

| RANGE | MRL | RESULT |
|---|---|---|
| >C6 - C8 | 10 | 19 |
| >C8 - C10 | 10 | 218 |
| >C10 - C16 | 20 | 2140 |
| >C16 - C24 | 20 | 1320 |
| >C24 - C40 | 50 | ND |
| **TOTAL TPH >C6 - C40** | | **3700** |

MRL = MINIMUM REPORTING LIMIT
ND = NOT DETECTED

## CHROMATOGRAM




SEVERN TRENT STL
Environmental Leadership

# TOTAL PETROLEUM HYDROCARBONS

Client Name: **URS CORPORATION LTD**

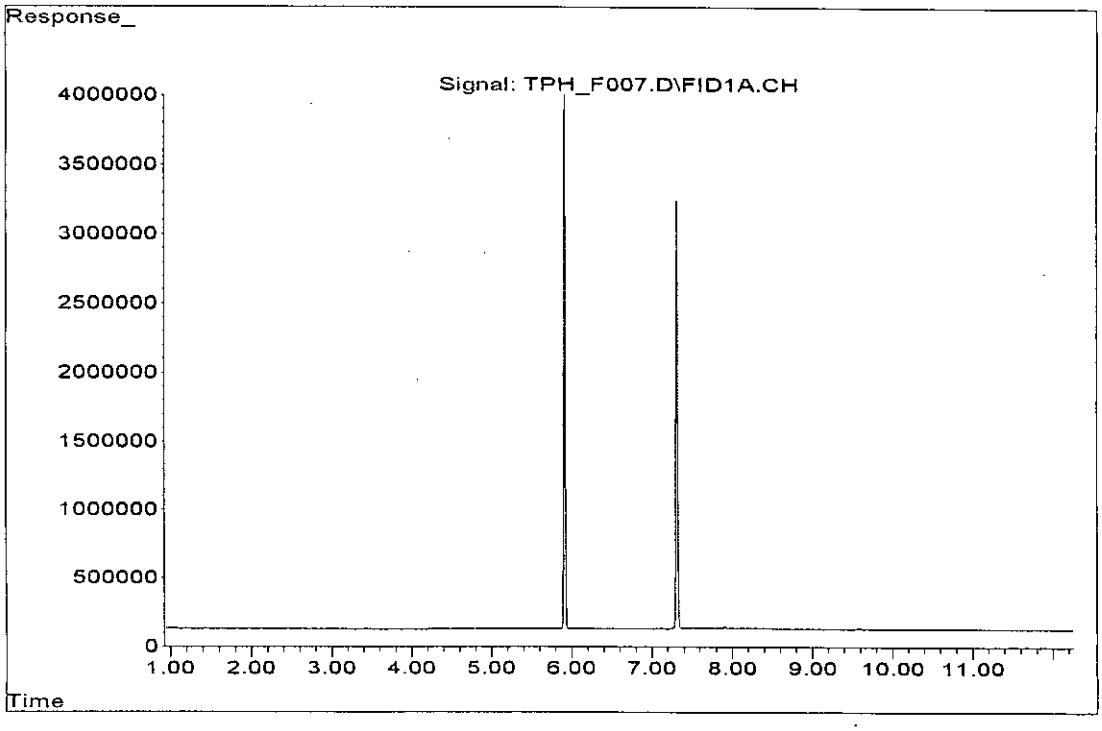
| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373226 | Method: | IN HOUSE |
| Job No.: | 165093 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | QC BLK 126935 | Accreditation Status: | NONE |
| Sample Matrix: | LIQUID | | |
| Vol. Extracted (mls): | 200 | | |
| Dilution Factor: | 1 | | |
| Report Date: | 18-Nov-2002 | CONCENTRATION UNITS: ug/L | |

## RESULTS

| RANGE | MRL | RESULT |
|---|---|---|
| >C6 - C8 | 10 | ND |
| >C8 - C10 | 10 | ND |
| >C10 - C16 | 20 | ND |
| >C16 - C24 | 20 | ND |
| >C24 - C40 | 50 | ND |
| **TOTAL TPH >C6 - C40** | | **ND** |

MRL = MINIMUM REPORTING LIMIT
ND = NOT DETECTED

## CHROMATOGRAM




SEVERN TRENT STL
Environmental Leadership

# RISK BASED TPH

Client Name: **URS CORPORATION LTD**

| | | | |
|---|---|---|---|
| Lab. Sample ID: | 373227 | Method: | IN HOUSE |
| Job No.: | 165093 | Data Type: | GC-FID |
| Sample Location: | NONE SUPPLIED | Quant. Type: | ISTD |
| Client Sample ID: | UST 6 | Accreditation Status: | NONE |
| Sample Matrix: | LIQUID | Report Date: | 18-Nov-02 |

CONCENTRATION UNITS >C6-C40: ug/L

| ALIPHATIC | RESULT |
|---|---|
| >C6 - C8 | <50 |
| >C8 - C10 | 1240 |
| >C10-C12 | 13300 |
| >C12-C16 | 155000 |
| >C16-C21 | 192000 |
| >C21-C40 | 36300 |

| AROMATIC | RESULT |
|---|---|
| >C6 - C7 | <50 |
| >C7 - C8 | <50 |
| >C8 - C10 | <50 |
| >C10-C12 | 2590 |
| >C12-C16 | 65100 |
| >C16-C21 | 112000 |
| >C21-C40 | 28900 |

**ANALYST COMMENT:** 40ml was extracted due to nature of sample.

TEST REPORT NUMBER R92447 PAGE 1 OF 1

LAB. JOB NUMBER 165093

# GAS CHROMATOGRAPHIC OIL IDENTIFICATION REPORT

**Customer : URS Corporation Ltd.**

Sample number : 373227

Sample Identification : ust 6
Analyst ID : GT

Sample description / treatment.

The sample received consisted of diesel smelling yellow water in a 500ml clear glass vial, with plastic stopper. The water was extracted with pentane and the pentane solution was analysed by GC-FID.

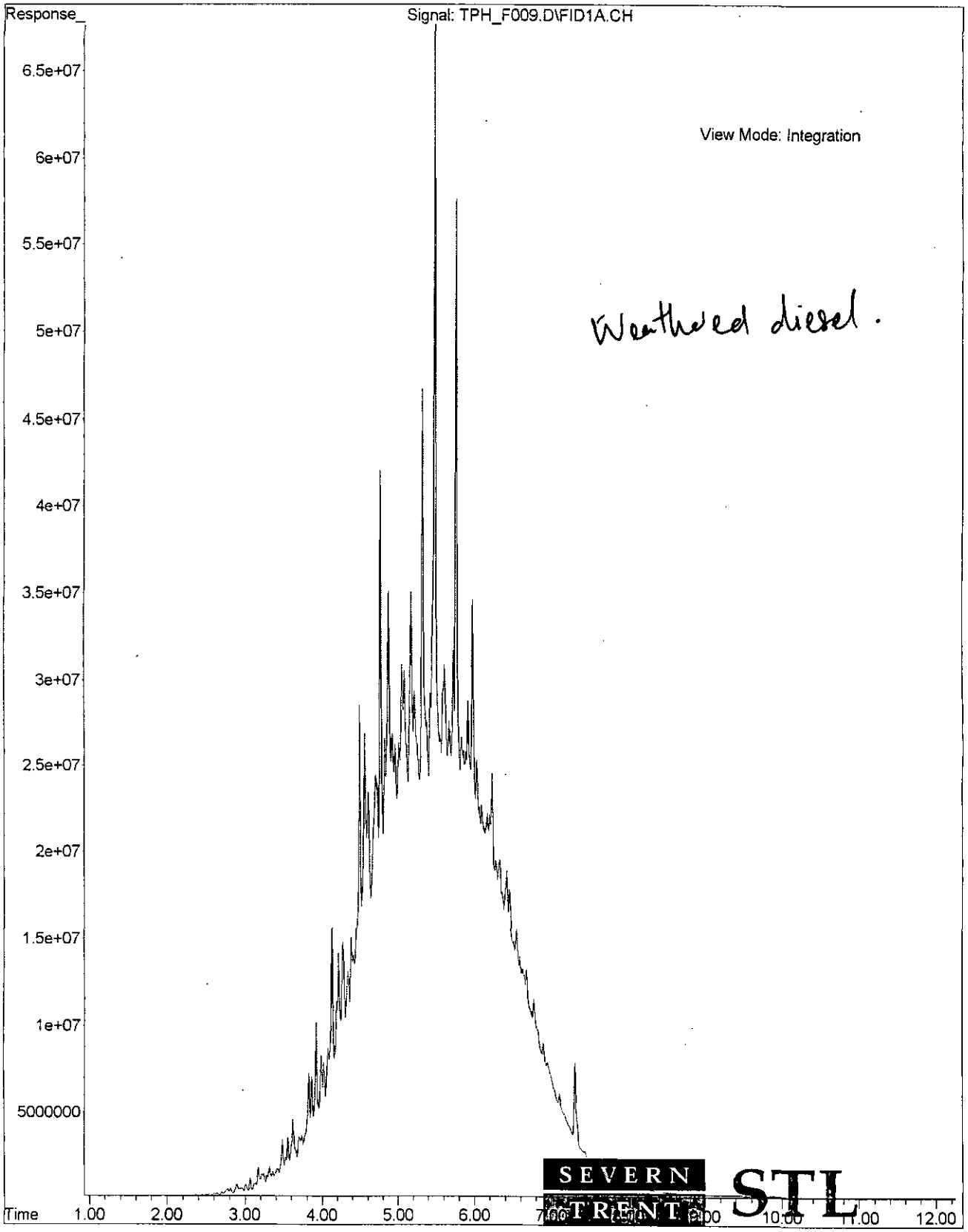
Analysis Report.

The GC-FID chromatogram obtained was indicative of a weathered diesel .

G.Tedds. Senior Analyst.

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File : N:\GC_D\NOV02\121102\TPH_F009.D
Operator : hw/jq
Acquired : 12 Nov 2002 4:49 pm using AcqMethod TPHGCD_B.M
Instrument : HP G1530A
Sample Name: 373227-W
Misc Info : UST 6
Vial Number: 9




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# SALES INVOICE

SEVERN TRENT
Environmental Leadership

STL

## FOR THE ATTENTION OF THE ACCOUNTS DEPARTMENT

**INVOICE ADDRESS :**

URS Corporation Limited
1 Drake Walk
Brigantine Place

Cardiff

UK
CF10 4AN

**ORDER NO :** C1374/JP
**INVOICE NO :** 122086
**INVOICE DATE :** 19/11/02
**CLIENT ACCOUNT :** DA0167
**REPORT NO :** 165093

| QUANTITY | INVOICE DETAILS | UNIT PRICE | AMOUNT |
|---|---|---|---|
| | SAMPLES RECEIVED 31/10/02 | | |
| | REF: 39991 BP LLANDARCY | | |
| 1 | OIL TYPE | £20.00 | £20.00 |
| 1 | RISK TPH | £30.00 | £30.00 |

| | |
|---|---|
| **TOTAL BEFORE VAT** | **£50.00** |
| **VAT @ 17.5 %** | **£8.75** |
| **TOTAL AMOUNT PAYABLE** | **£58.75** |

**REPORT ADDRESS :**

URS Corporation Limited
1 Drake Walk
Brigantine Place

Cardiff

UK
CF10 4AN

## PAYMENT IS DUE 30 DAYS FROM DATE OF INVOICE

**Please make all cheques payable to SEVERN TRENT LABORATORIES LTD**

VAT REG NO 486 9855 65

SEVERN TRENT STL

Environmental Leadership

***Ms Porter***
***URS Corporation Limited***
***1 Drake Walk***
***Brigantine Place***
***Cardiff CF10 4AN***

19 November 2002

**Test Report : TH /165093/2002**

Dear Ms Porter,

Analysis of your sample(s) submitted on 31/10/2002 is now complete and we have pleasure in enclosing the appropriate test report(s).

Should you have any query on the report(s) or any part of our service we will be happy to discuss your requirements.

An invoice for the analysis carried out is included with this report.

Thank you for using STL and we look forward to receiving your next samples.

To arrange a container delivery or sample collection please ring the direct line to **COURIERS on 024 7685 6562.**

Yours Sincerely,

Signed :

Name : J. Fell

Title : Section Manager

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0897
1229

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ISO 9001 UKAS QUALITY MANAGEMENT
Cert. No.Q6687
Field Services

ISO 14001 UKAS ENVIRONMENTAL MANAGEMENT
Cert. No. E10269

A part of Severn Trent plc

*Registered in England & Wales*
Registration No. 2148934
Registered Office:
2297 Coventry Road,
Birmingham B26 3PU

**Severn Trent Laboratories Limited.**
**STL Coventry** • STL Business Centre, Torrington Avenue, Coventry, CV4 9GU United Kingdom
Tel +44 (0)2476 421 213 Fax +44 (0)2476 856 575 • *www.stl-analytical.co.uk*

# Appendix F - Datasheet for Gas Membrane

data toughsheet BUILDING PRODUCTS

PRODUCT SPECIFICATION

# High Performance Gas Control Membrane

## Description

Toughsheet Radon Barrier is a radon and carbon dioxide impermeable membrane comprising of high quality recycled polythene.

## Uses

Gas membrane designed to protect buildings and their occupants from the effects of radon, carbon dioxide and other harmful gases. Like conventional ground membranes, Toughsheet Radon Barrier also acts as a damp-proof membrane to help protect the building against the ingress of moisture from the ground.

## Advantages

- Loose-laid system for ease of application.
- Can be used on ground-bearing concrete floors or on suspended concrete or beam and block floors.

## Maintenance

Toughsheet Radon Barrier is robust and will resist puncture during and after installation providing adequate care is taken to protect the membrane directly after installation. The membrane should be inspected prior to pouring a ground slab or screed and, should any holes or tears be found, these should be repaired using patches of Toughsheet Radon Barrier taped in place using Toughsheet jointing tape with at least a 150mm lap beyond the extremity of the puncture.

## Typical properties

| | |
|---|---|
| Membrane thickness | 300mu |
| Weight (DIN53104) | 315g/m |
| Roll weight (4m x 25m) | 27.6 kg |
| Radon gas transmission rate (BR212) | 0.00 |
| Bursting strength (DIN53141) | 500kPa (min) |

## Design criteria

Building Regulations and Technical Standards require measures to be taken to prevent the build up of harmful gases inside buildings.
Toughsheet Radon Barrier offers protection from radon and carbon dioxide when included in schemes designed and installed with reference to the guidance offered by the above document.

ISOQAR QUALITY ASSURED FIRM ISO 9002 Certificate No 2092/99 026
UKAS QUALITY MANAGEMENT

Accredited
Reprocessor
DOE ER199846

Valpak
2001 Challenge
Award Winner
Recycling



Chequerbent Works • Manchester Road • Westhoughton • Bolton BL5 3JF
Tel: 01942 841111 • Fax: 01942 842388 • sales@toughsheet.com • www.toughsheet.com

# High Performance Gas Control Membrane

## Application instructions

### Preparation

### Underslab ground membranes

The hard-core bed should be blinded with soft sand and consolidated to provide a smooth bed free of sharp projections.

### Overslab ground membranes

The top surface of the concrete slab should be free from ridges, undulations and sharp projections. If this is not the case a sand bed may be necessary to reduce the risk of puncturing the membrane.

### Laying

The membrane should be laid neatly and tucked well into angles to prevent bridging. At corners in upstands folded welts should be formed.

### Lapping and jointing

Rolls of Toughsheet Radon Barrier should be lapped by a minimum of 150mm and sealed with a continuous strip of Radon Recommeded Tape.
Ensure that the membrane is clean and dry at the time of jointing.

### Protection

Protect the completed membrane adequately to prevent puncturing using 80g/m$^2$ geotextile. Alternatively, the overlying construction, such as insulation, can be installed prior to pouring of concrete. If used in an overslab situation, unbonded screeds should be at least 50mm thick and laid as soon as possible after completing the membrane to reduce the risk of puncture.

### Penetrations

Where possible services should be routed such that they do not pass through the membrane, thus reducing the number of penetrations. If puncturing is unavoidable then repairs should take place in a similar fashion described in the maintenance section.

### Storage

Store in original unopened packaging, in cool dry conditions, away from direct sunlight.

ISOQAR QUALITY ASSURED FIRM ISO 9002 Certificate No 2092/99 026
UKAS QUALITY MANAGEMENT

Accredited
Reprocessor
DOE ER199846

Valpak
2001 Challenge
Award Winner
Recycling



Chequerbent Works • Manchester Road • Westhoughton • Bolton BL5 3JF
Tel: 01942 841111 • Fax: 01942 842388 • sales@toughsheet.com • www.toughsheet.com

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CI/SfB

(13.9) Ln6

**Frank Mercer & Sons Ltd**
Chequerbent Works
Manchester Road
Chequerbent
Westhoughton
Bolton BL5 3JF
Tel: 01942 841111 Fax: 01942 842388

**Agrément Certificate No 99/3603**
*Third issue**

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

Designated by Government to issue European Technical Approvals

## TOUGHSHEET DAMP-PROOF MEMBRANES

Membrane étanche à l'humidité
Feuchtigkeitsperre

## Product



- *THIS CERTIFICATE RELATES TO TOUGHSHEET DAMP-PROOF MEMBRANES, POLYETHYLENE MEMBRANES FOR USE IN SOLID CONCRETE GROUND FLOORS THAT ARE NOT SUBJECT TO HYDROSTATIC PRESSURE, TO PROTECT BUILDINGS AGAINST WATER FROM THE GROUND.*
- *The products are available in three thicknesses: 250 µm, 300 µm and 500 µm.*
- *It is essential that the membranes are laid in accordance with clause 11 of CP 102 : 1973 or with this Certificate.*

## Regulations

### 1 The Building Regulations 2000 (England and Wales)

The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of damp-proof membranes with the Building Regulations. In the opinion of the BBA, Toughsheet Damp-proof Membranes, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

| | | |
|---|---|---|
| Requirement | C4 | Resistance to weather and ground moisture |
| Comment: | | When laid in accordance with this Certificate, the products will meet this Requirement. See section 8 of this Certificate. |
| Requirement: | **Regulation 7** | Materials and workmanship |
| Comment: | | The products are acceptable materials. See section 13.1 of this Certificate. |

### 2 The Building Standards (Scotland) Regulations 1990 (as amended)

In the opinion of the BBA, Toughsheet Damp-proof Membranes, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and Technical Standards as listed below.

| | | |
|---|---|---|
| **Regulation:** | 10 | Fitness of materials |
| Standard: | B2.1 | Selection and use of materials and components |
| Comment: | | The products comply with this Standard. See section 13.1 of this Certificate. |

continued

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continued

| | | |
|---|---|---|
| Regulation: | 17 | Resistance to moisture |
| Standard: | G2.6 | Resistance to moisture from the ground |
| Comment: | | The products can enable a floor to satisfy the requirements of this Standard. See section 8 of this Certificate. |

### 3 The Building Regulations (Northern Ireland) 2000

In the opinion of the BBA, Toughsheet Damp-proof Membranes, if used in accordance with the provisions of this Certificate, can satisfy or contribute to satisfying the various Building Regulations as listed below.

| | | |
|---|---|---|
| Regulation: | B2 | Fitness of materials and workmanship |
| Comment: | | The products are acceptable materials. See section 13.1 of this Certificate. |
| Regulation: | C4 | Resistance to ground moisture and weather |
| Comment: | | The products can enable a floor to satisfy the requirements of this Regulation. See section 8 of this Certificate. |

### 4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

| | |
|---|---|
| See section: | *5 Description* (5.1). |

## Technical Specification

### 5 Description

5.1 Toughsheet Damp-proof Membranes are a blown film of extruded polyethylene. The nominal characteristics are shown in Table 1.

*Table 1 Nominal characteristics*

| Characteristics (units) | Grade | | | Tolerance |
|---|---|---|---|---|
| | 250 | 300 | 500 | |
| Thickness (µm) | 250 | 300 | 500 | ±10%[1] |
| Roll weight (kg) | 23 | 27.6 | 23 | −0%, +10% |
| Standard roll length (m) | 25 | 25 | 12.5 | −0%, +5% |
| Standard sheet width (m) | 4 | 4 | 4 | −0%, +5% |
| Colours | blue black clear | blue black yellow[2] | blue black yellow[2] | |

(1) A tolerance of ±12% is allowed in Draft MOAT 61 : January 1998 *Guideline for the assessment of polyethylene damp-proof membranes* with a single value ≥80% of the nominal.

(2) The yellow membrane is for use as a radon gas control membrane.

5.2 Ancillary materials used with Toughsheet Damp-proof Membranes are:

Mastic tape — at least 0.2 mm thick, 25 mm wide, used for jointing.

Girth tape — adhesive polyethylene tape, 100 mm wide, used for sealing joints.

5.3 Quality control checks carried out on the final product include:

width
spot thickness
roll weight
impact resistance (body and fold)
tensile strength
elongation at break
tear strength.

### 6 Delivery and storage

6.1 Rolls of Toughsheet are packed in wrappers bearing labels with the product's name and the BBA identification mark incorporating the number of this Certificate. Rolls are supplied shrink-wrapped and on pallets.

6.2 Rolls should be stored under cover on the original pallet or, individually, on end.

## Design Data

### 7 General

7.1 Toughsheet Damp-proof Membranes are satisfactory for use in concrete floors which are not subjected to a hydrostatic pressure, in accordance with the relevant clauses of CP 102 : 1973.

7.2 The membranes can be installed either as an oversite membrane, situated between a blinded hardcore bed and the base concrete, or as a sandwich membrane in base concrete or between the base concrete and the screed.

7.3 The 300 µm and 500 µm membranes meet the requirements for use as a gas control membrane against radon or on gas contaminated land in accordance with the recommendations published by the Building Research Establishment (BRE) and the national Building Regulations.

### 8 Resistance to water and water vapour

8.1 The membranes and the methods of jointing provide an effective barrier to the passage of liquid water and water vapour from the ground.

8.2 The membranes have minimum nominal sheet thicknesses greater than the requirements of the relevant documents to the national Building Regulations. Therefore, the products comply with

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the requirements of the national Building Regulations, if installed in the manner described in the relevant documents, or in accordance with section 14 of this Certificate (Scotland only):

*England and Wales*

Approved Document C, Requirement C4, Section 3, Clauses 3.5 and 3.6.

*Scotland*

Regulation 17, Standard G2.6.

*Northern Ireland*

Regulation C4, Technical Booklet C, Sections 1.0 and 2.0.

## 9 Resistance to puncturing

The membranes have high resistance to puncture. On smooth or blinded surfaces they will not be damaged by normal foot or site traffic (eg wheelbarrows) but care should be taken to avoid damage during installation, particularly when handling building materials and equipment over the surface and when placing concrete or screeds, since they can be punctured by sharp objects.

## 10 Site conditions

10.1 The membranes may be installed in all conditions normal to the ground-floor slab construction. Where there is a risk of ground becoming waterlogged, sub-soil drainage must be provided in accordance with CP 102 : 1973.

10.2 The membranes remain flexible in the extremes of temperature likely to occur in practice.

## 11 Underfloor heating

When used in conjunction with underfloor heating under normal operating conditions there will be no adverse effect on the membranes; however, the manufacturer's advice should be sought.

## 12 Floor finishes

The type of floor finish to be used may limit the suitability of polyethylene dpm's; the guidance given in CP 102 : 1973 should be followed.

## 13 Durability

13.1 When subject to the normal conditions of use, the membranes will provide an effective barrier to the transmission of liquid water and water vapour for the life of the concrete slab in which they are installed.

13.2 Long periods of exposure to ultraviolet light will reduce the effectiveness of the membranes. The membranes should be protected from such exposure during storage and when in use.

# Installation

## 14 General

14.1 Installation of Toughsheet Damp-proof Membranes should be in accordance with the manufacturer's instructions and Clause 11 of CP 102 : 1973, the relevant clauses of BS 8000-4 : 1989, or section 15 of this Certificate.

14.2 Unless the base is smooth a surface blinding of soft sand (or similar material) should be used to prevent puncturing during installation or when the concrete or screed is being placed.

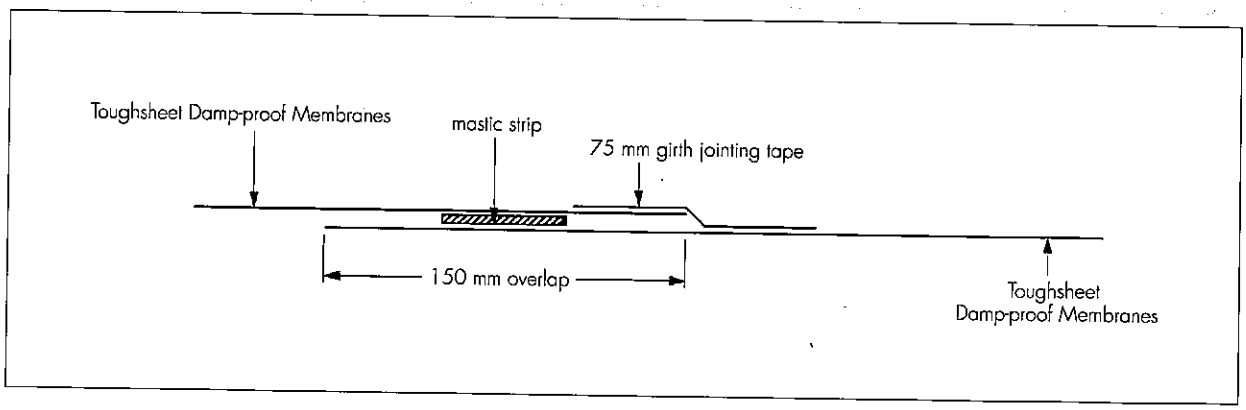
14.3 Sheets must be clean and free from dirt and grease.

## 15 Procedure

15.1 Adjacent sheets should be overlapped by at least 150 mm and should be bound with mastic strips and sealed with 100 mm wide girth jointing tape (see Figure 1).

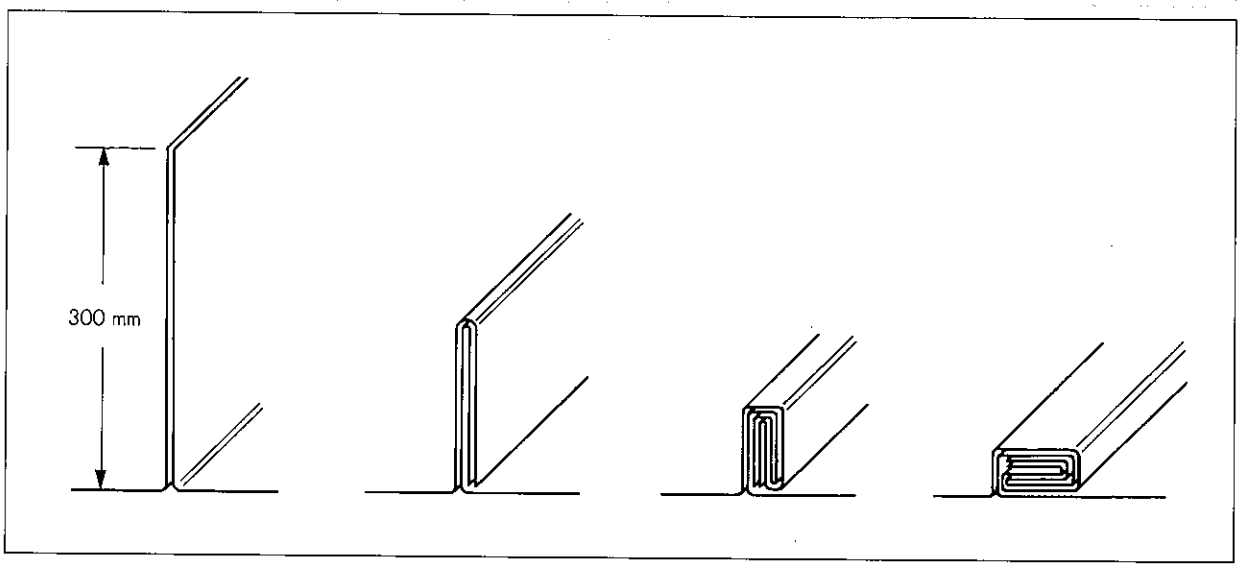
15.2 Alternatively, when it is not possible to keep the sheet dry, a double welted fold should be formed using at least 300 mm of the membrane. It is essential that the fold is held in position prior to placing the concrete, eg by weighting with bricks (see Figure 2).

*Figure 1 Mastic tape joint*



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*Figure 2 Double welted fold joint*




15.3 Perforation or punctures in the sheets should be patched with sheets of identical thickness lapped at least 150 mm beyond the limits of the puncture and the laps so formed sealed with double-sided, pressure-sensitive tape.

15.4 The damp-proof membrane must be continuous with the damp-proof course in the surrounding walls. Where necessary the product should be used as a vertical damp-proof course to link the two.

15.5 The membranes must be covered, by a screed or other protective layer, as soon as possible after installation. Care should be taken to ensure that the membrane is not stretched or displaced when placing the concrete or screed over the membrane. Sufficient allowance should be made to avoid bridging (ie creating areas of unsupported membrane) during screeding operations at details such as internal angles.

*Table 2 Physical properties — general*

| Test (units) | Method[1] | Mean results | |
|---|---|---|---|
| | | 250 | 300 |
| Thickness (mm) | Direct measurement | 0.26 | 0.29 |
| Sheet width (mm) | | 4052 | — |
| Density ($kgm^{-3}$) | BS 2782 : (620A) | 937 | — |
| Water vapour transmission rate ($gm^{-2}day^{-1}$) | BS 3177 (25°C/75% RH) | 0.50 | 0.48 |
| Water vapour resistance ($MNsg^{-1}$) | BS 3177 (25°C/75% RH) | 410 | 428 |
| Dart impact (g) | BS 2782 : (352D)[3] | 418 | — |
| Leakage at joints | MOAT 27 : 5.2.1 | pass | pass |
| Tensile strength of joints (N) | MOAT 27 : 5.2.2 | | |
| unaged | | 175.3 | — |
| heat aged[2] | | 184.8 | — |

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the document.
(2) Heat aged at 60°C for 28 days
(3) Tested to a withdrawn standard
— Not tested

*Table 3 Physical properties — directional*

| Test (units) | Method[1] | Mean results | |
|---|---|---|---|
| | | Longitudinal | Transverse |
| Tensile strength (at break) ($Nmm^{-2}$) | BS 2782 : (320A) (500 mm/min) | | |
| **250 µm** | | | |
| unaged | | 19.1 | 19.7 |
| heat aged[2] | | 20.3 | 19.2 |
| UV aged[3] | | 16.5 | 15.9 |
| **300 µm** | | | |
| unaged | | 18.3 | 18.7 |
| Elongation at break (%) | BS 2782 : (320A) (500 mm/min) | | |
| **250 µm** | | | |
| unaged | | 612 | 651 |
| heat aged[2] | | 637 | 646 |
| UV aged[3] | | 580 | 578 |
| **300 µm** | | | |
| unaged | | 578 | 633 |
| Nail tear (N) | MOAT 27 : 5.4.1 | | |
| **250 µm** | | | |
| unaged | | 101 | 90 |
| heat aged[2] | | 107 | 107 |
| **300 µm** | | | |
| unaged | | 119 | 116 |
| Trouser tear ($Nmm^{-1}$) | BBA method[4] | | |
| **250 µm** | | | |
| unaged | | 182 | 198 |
| heat aged[2] | | 200 | 207 |
| **300 µm** | | | |
| unaged | | 196 | 217 |
| Dimensional stability (%) | MOAT 27 : 5.1.6.1 | | |
| **250 µm** | | −0.27 | +0.12 |
| **300 µm** | | −0.17 | +0.07 |
| Low temperature flexibility (°C) | MOAT 27 : 5.4.2 | | |
| **250 µm** | | ≤−25 | ≤−25 |
| **300 µm** | | ≤−25 | ≤−25 |

(1) The test documents are detailed in the *Bibliography*. Numbers in the table refer to sections/parts of the document.
(2) Heat aged at 80°C for 56 days.
(3) UV aged for 100 light hours using a QUV-B/4 hours UV at 50°C/4 hours condensation at 50°C.
(4) In general accordance with BS 2782-3 : Method 360B : 1980.

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## Technical Investigations

The following is a summary of the technical investigations carried out on Toughsheet Damp-proof Membranes.

### 16 Tests

16.1 Samples were obtained from the manufacturer for testing. A summary of tests showing typical values for the material is detailed in Tables 2 and 3.

16.2 Dimensional measurements were carried out on a sample roll of 500 µm membrane.

### 17 Other investigations

17.1 A factory inspection was carried out to assess and examine the manufacturing process and quality control methods.

17.2 An assessment of the test data was made in accordance with Draft MOAT No 61 : January 1998.

## Bibliography


BS 2782 *Methods of testing plastics*
BS 2782-3 *Mechanical properties*
BS 2782-3 : Methods 320A to 320F : 1988 *Tensile strength, elongation and elastic modulus*
BS 2782-3 : Method 360B : 1980 *Determination of tear strength of sheet and sheeting (trouser tear method)*
BS 2782-3 : Method 352D : 1979 (Superseded) *Determination of falling weight impact resistance of thin flexible sheet (film)*
BS 2782-6 *Dimensional properties*
BS 2782-6 : Methods 620A to 620D : 1980 *Determination of density and relative density of non-cellular plastics*
BS 2782-7 *Rheological properties*
BS 2782-7 : Method 720A : 1979 *Determination of melt flow rate of thermoplastics*

BS 3177 : 1959 *Method for determining the permeability to water vapour of flexible sheet materials used for packaging*

BS 8000 *Workmanship on building sites*
BS 8000-4 : 1989 *Code of practice for waterproofing*

CP 102 : 1973 *Code of practice for protection of buildings against water from the ground*

MOAT No 27 : 1983 *General Directive for the Assessment of Roof Waterproofing Systems*

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## Conditions of Certification

### 18 Conditions

18.1 This Certificate:

(a) relates only to the product that is described, installed, used and maintained as set out in this Certificate;

(b) is granted only to the company, firm or person identified on the front cover — no other company, firm or person may hold or claim any entitlement to this Certificate;

(c) has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective;

(d) is copyright of the BBA.

18.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, shall be construed as references to such publication in the form in which it was current at the date of this Certificate.

18.3 This Certificate will remain valid for an unlimited period provided that the product and the manufacture and/or fabricating process(es) thereof:

(a) are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA;

(b) continue to be checked by the BBA or its agents; and

(c) are reviewed by the BBA as and when it considers appropriate.

18.4 In granting this Certificate, the BBA makes no representation as to:

(a) the presence or absence of any patent or similar rights subsisting in the product or any other product;

(b) the right of the Certificate holder to market, supply, install or maintain the product; and

(c) the nature of individual installations of the product, including methods and workmanship.

18.5 Any recommendations relating to the use or installation of this product which are contained or referred to in this Certificate are the minimum standards required to be met when the product is used. They do not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such recommendations to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the installation and use of this product.

BBA BRITISH BOARD OF AGRÉMENT
TECHNICAL APPROVALS FOR CONSTRUCTION

**In the opinion of the British Board of Agrément, Toughsheet Damp-proof Membranes are fit for their intended use if installed, used and maintained as set out in this Certificate. Certificate No 99/3603 is accordingly awarded to Frank Mercer & Sons Ltd.**

On behalf of the British Board of Agrément

Date of Third issue: 12th November 2001

Chief Executive

**Original Certificate was issued on 29th April 1999. This amended version includes revised Building Regulations and CDM Regulations and additions to product range.*

British Board of Agrément
P O Box No 195, Bucknalls Lane
Garston, Watford, Herts WD25 9BA
Fax: 01923 665301

©2001

e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk

For technical or additional information, tel: 01923 665300.
For information about Agrément Certificate validity and scope, tel:
Hotline: 01923 665400

# Appendix G - Datasheet for Warning Membrane

# INDICATOR MESH

Indicator mesh is a highly visible extruded mesh used on bridge decks to indicate and protect the waterproof membrane. The indicator mesh is laid over a layer of sand, asphalt or a fine binder course which has been laid over the waterproof membrane on the bridge deck. A binder course is laid above the indicator mesh, before the bridge surface course is laid.

Indicator mesh is a great alternative to other depth indicator techniques such as red sand. The indicator mesh ensures that future resurfacing contractors undertaking subsequent planing or repairs to the bridge surface and binder course are given clear warning that the waterproof membrane is below.

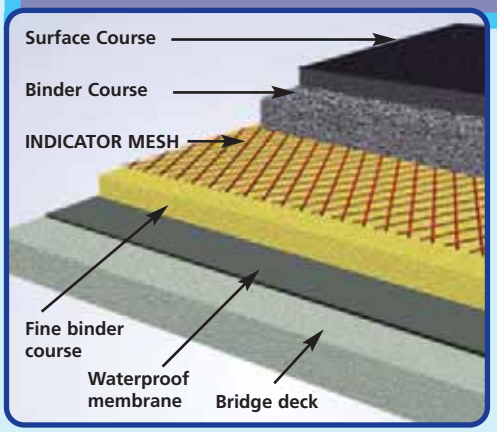
Indicator mesh is available 1.5m wide in red. Yellow and orange can be manufactured subject to minimum order quantities.

- Highly visible indication mesh
- Manufactured from high density polyethylene
- Rot resistant and chemically inert

Indicator mesh can also be used to indicate membranes on roads, to indicate areas of soil contamination and in the installation of pond liners.












## SPECIFICATIONS

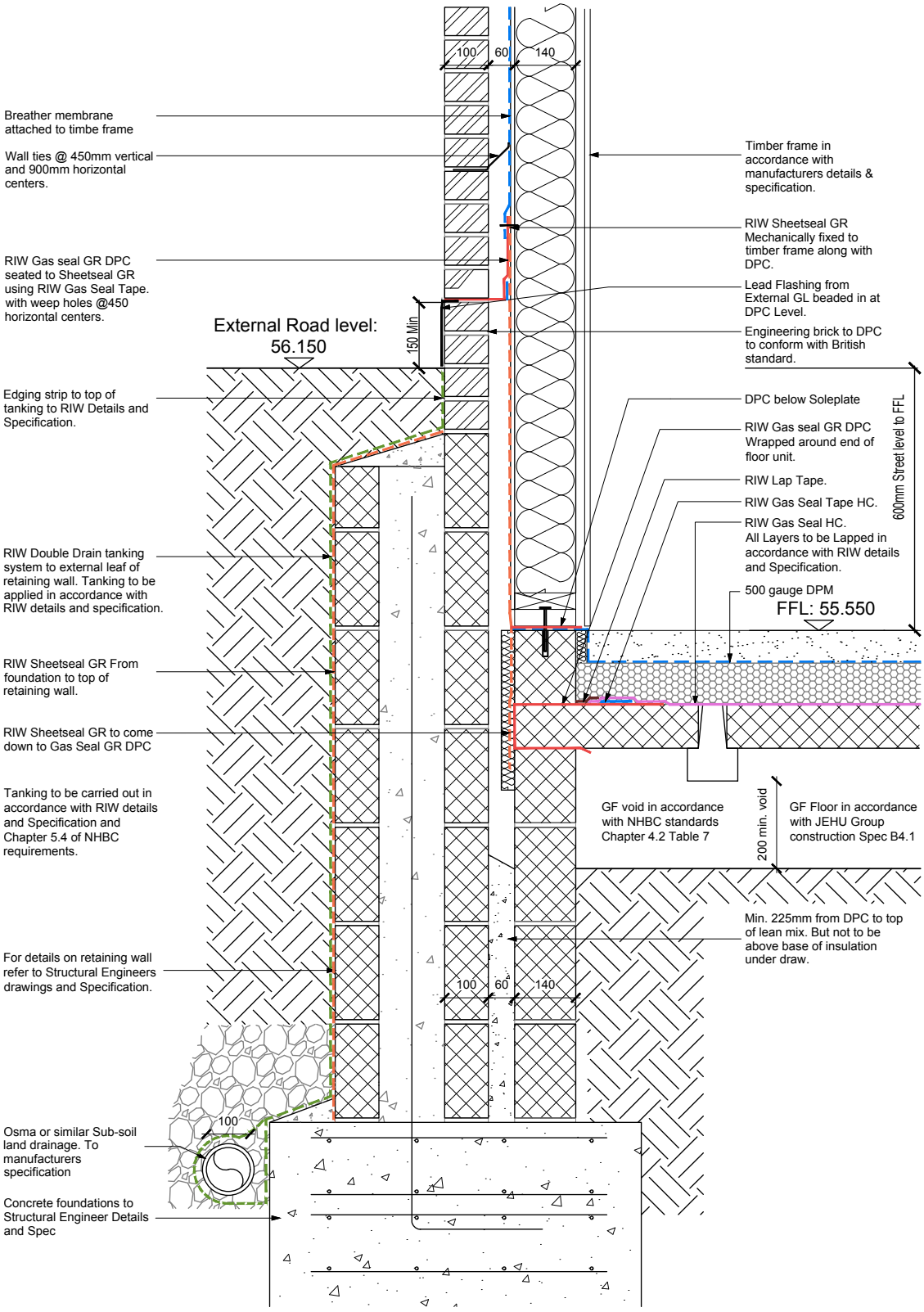
| ROLL SIZE | COLOURS | MESH THICKNESS | WEIGHT | MATERIAL | PART NO. |
|---|---|---|---|---|---|
| 1.5m x 50m | Red | 3mm | 600g/m² | HDPE | 044351 |

PR20-07

Boddingtons Ltd • Blackwater Trading Estate • The Causeway • Maldon • Essex CM9 4GG • England
**Tel: +44 (0) 1621 874200 Fax: +44 (0) 1621 874299**
e.mail: sales@boddingtons-ltd.com • www.boddingtons-ltd.com

# APPENDIX C

## ROBERTS LIMBRICK GROUND GAS PROTECXTION DETAILS




External Wall Tanking Detail


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Do not scale from this drawing, use only figured dimensions and report any discrepancies or omissions to the Architect immediately


| rev | date | description |
|---|---|---|
| A | 10.05.19 | Issued For Construction |
| B | 10.05.19 | Issued For Construction |

Roberts Limbrick ARCHITECTS

project: Residential Development
Heritage Gate
Coed Darcy
-

client: Heritage Gate

drawing: External Wall
Tanking detail
Plot 6
House Type N

status: CONSTRUCTION


ROBERTS LIMBRICK LTD
The Carriage Building, Bruton Way, Gloucester, GL1 1DG
The Estates Office, 25 - 26 Cold Tops, Newport, NP20 4PG
T. 03333 405 500
mail@RobertsLimbrick.com
www.RobertsLimbrick.com
Registered Office England No. 06858029


scale: 1:10 @ A3
date: April 2018
author: RL

project: 9117.1027
drg no.
rev: B

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| rev | date | description |
|---|---|---|
| A | 30.04.19 | Preliminary issue |
| B | 10.05.19 | Issued For Construction |

Roberts Limbrick ARCHITECTS

project
Residential Development
Heritage Gate
Coed Darcy
-

client
Heritage Gate

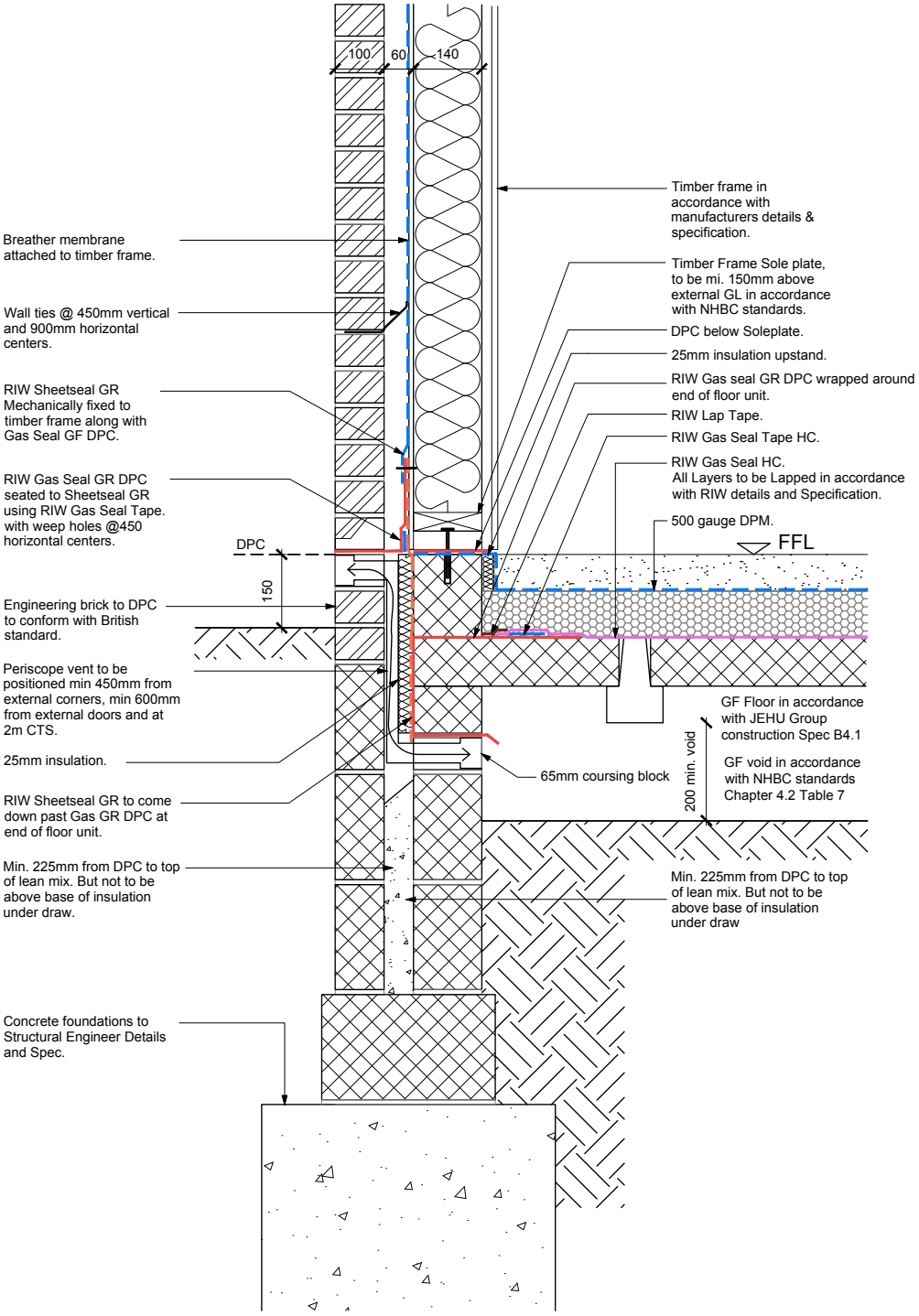
drawing
Retaining Garage Wall
Tanking detail
Plots 7-11
Single Garage

status
CONSTUCTION

ROBERTS LIMBRICK LTD
The Carriage Building, Bruton Way, Gloucester, GL1 1DG
The Estates Office, 25 - 26 Cold Tops, Newport, NP20 4PG
T. 03333 405 500
mail@robertslimbrick.com
www. robertslimbrick.com
Registered Office: England No. 6983839

| scale | 1/10 @ A3 | | |
|---|---|---|---|
| date | April 2018 | author | RL |
| project | drg no. | | rev. |
| 9117 / 1028 | | | B |

# Retaining Garage Wall Tanking Detail




# Suspended Floor - Gas Membrane Detail

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Do not scale from this drawing, use only figured dimensions and report any discrepancies or omissions to the Architect immediately.

| rev | date | description |
|---|---|---|
| A | 10.05.19 | Issued For Construction |
| B | 10.05.19 | Issued For Construction |

Roberts Limbrick ARCHITECTS

project
Residential Development
Heritage Gate
Coed Darcy
-

client
Heritage Gate

drawing
Suspended Floor - Gas Membrane Detail
-
-

status
CONSTRUCTION

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scale 1:10 @ A3
date April 2018
author RL

project drg no. rev.
9117 1029 B

CE nssPlus

CI/SfB | | | Tn6 | L14143 |

January 2018

# RIW GAS SEAL HC

Gas Seal HC is a 0.5mm thick, unique blended polyethylene membrane, for use where protection against ground gas and hydrocarbons are required.

## BENEFITS

- Hydrocarbon, methane, carbon dioxide, radon and VOC barrier
- Manufactured from virgin material, not recycled waste
- Separate damp proof membrane not required
- Robust jointing and sealing system
- High puncture resistance
- Welded joints possible
- Complies with latest codes of practice as published by CIRIA and BRE
- Compliant with BS 8485: 2015

## APPLICATIONS

- Combined ground floor damp proof membrane and hydrocarbon/gas barrier

## APPLIED TO

- Sand blinding
- Concrete blinding
- Suspended floors
- Ground bearing slabs

REMEMBER IT'S waterproof RIW

# RIW GAS SEAL HC

## TYPICAL USES

Gas Seal HC is typically used as a polyethylene gas barrier and damp proof membrane in concrete floors below the slab.

The installed product protects the structure against moisture, hydrocarbons and VOC contaminents, as well as methane, carbon dioxide and radon gases from the ground.

## DURABILITY

Subject to normal conditions of use Gas Seal HC will remain effective against the ingress of water, water vapour and hydrocarbons, and will restrict the ingress of radon, methane and carbon dioxide during the lifetime of the building.

Where protection from hydrocarbons are required, laps in the product should be welded throughout.

## SPECIFICATION

J40 Flexible sheet waterproofing / damp proofing
Clause 140 Loose laid polyethylene gas retardant damp proofing.
Clause 145 Loose laid weldable polyethylene gas retardant damp proofing.
Please consult RIW for further information.

## INDEPENDENT AUTHORITY

CE Marked to BS EN 13967. For Declaration of Performance see:

http://www.riw.co.uk/technical-downloads/ce-marking

## PERFORMANCE & COMPOSITION

| | |
|---|---|
| Form | Loose laid sheet |
| Colour | Black |
| Overall thickness | 0.5mm |
| Roll size | 2.0m wide x 50m long |
| Weight | 50.0kg/roll |
| Laps | 150mm or welded |
| Tensile Strength EN 12311-1:<br>MD<br>CMD | <br>>550 N/50mm$^2$<br>>400 N/50mm$^2$ |
| Tensile Elongation EN 12311-1:<br>MD<br>CMD | <br>400%<br>400% |
| Resistance to tearing (nail shank) EN 12310-1<br>MD<br>CD | <br>>300N<br>>400N |
| Water Vapour Transmission Rate BS EN 1931 | 0.14 g/m2/day |
| Radon permeability K124/02/95 | 3.0 x $10^{-12}$ m$^2$. s |
| Methane gas permeability BS EN ISO 15105-1 | 0.13ml/m$^2$/day/atm |
| Carbon dioxide permeability BS EN ISO 15105-1 | 3.01ml/m$^2$/day/atm |

The above performance figures are typical values and should not be considered a product specification.

## ANCILLARY PRODUCTS

RIW produce a range of ancillary products for use with Gas Seal HC which include:
Gas Seal Tape HC - self-adhesive butyl tape for sealing between overlaps in the membrane.
Lap Tape - self-adhesive PVC tape for sealing edges of lapped product.
Preformed pipe collars - flexible collar for sealing around pipe penetrations.
Preformed Gas cloaks - standard or bespoke cloak units to facilitate membrane application.
Gas Seal GR DPC - gas resistant damp proof course/ cavity tray for building into masonry.
Geo-vent - cuspated HDPE venting geo-composite incorporating geotextile to one side.
Geo-vent T Connector - end connector incorporating 25mm slot for Geo-vent.
Peri-vent sets - periscopic vent complete with airbrick and Geo-vent adaptor.
Venting bollards and ground level vent boxes are also available.

## CONSTRUCTION

### GENERAL

All construction should conform with the Building Regulations, Codes of Practice and British Standards in current use at the time the building is being constructed.

Wherever possible, services should enter the building above slab level to avoid penetrating the gas-resistant membrane. However, the water service and soil vent pipes will usually be required to enter the building through the slab and membrane.

### PREPARATION

The membrane should be laid on a smooth surface, free from voids, hollows and objects which may damage the membrane. If used below a ground bearing slab, the product may be laid on a sand blinding.

### APPLICATION

The completed gas proofing system must cover the entire footprint of the building.

Gas Seal HC should be unrolled onto the prepared surface, and be smoothed out if necessary.

Subsequent rolls should then be lapped onto the previous roll by 150mm, and be sealed using Gas Seal Tape HC placed centrally in the lap. Lap Tape should then be laid over the edge of the upper sheet, by 50mm, and be adhered down onto the lower sheet.

Alternatively, the product may be welded to provide a continuous sheet barrier.

Pipe penetrations should be sealed using Preformed Pipe Collars; sealed to the membrane, and pipe using Gas Seal Tape HC and Lap Tape ; see Pipe Penetration Detail.

Gas Seal GR DPC should be used be used to provide continuity through the walls, with Gas Seal HC lapped and sealed onto it using Gas Seal Tape HC and Lap Tape as before.

Damaged areas should be patch repaired as necessary, using similar lapping / sealing details.

Gas Seal HC will achieve 2 points according to BS8485: 2015 when installed by qualified specialists and independently validated.

## COMPATIBILITY TABLE

| | BRE 211 Radon | CIRIA 665 Characteristic Situation 2 | BS8485 Characteristic Situation 2 | CIRIA 665 Characteristic Situation 3-6 | BS8485 Characteristic Situation 3-6 | NHBC Amber 1 | NHBC Amber 2 & Red |
|---|---|---|---|---|---|---|---|
| Radon | YES | n/a | n/a | n/a | n/a | n/a | n/a |
| Carbon Dioxide | n/a | YES | YES | YES | YES | YES | YES |
| Methane | n/a | YES | YES | YES | YES | YES | YES |
| Hydrocarbon Vapour | n/a | YES | YES | YES | YES | YES | YES |
| Hydrocarbon Substances | n/a | YES | YES | YES | YES | YES | YES |

### SPECIFIC USES

Gas Seal HC should be installed with the ancillary products required, in accordance with current guidance for gas protection systems; including BRE211 / 414, CIRIA C665 & BS 8485.

## SAFETY

Full health and safety instructions are contained on the product material safety data sheets, and these must be referred to before use.

## SUPPLY

### AVAILABILITY

All products can be obtained through Builders Merchants or approved stockists. A list of approved stockists is available from RIW's offices.

### PACKAGING

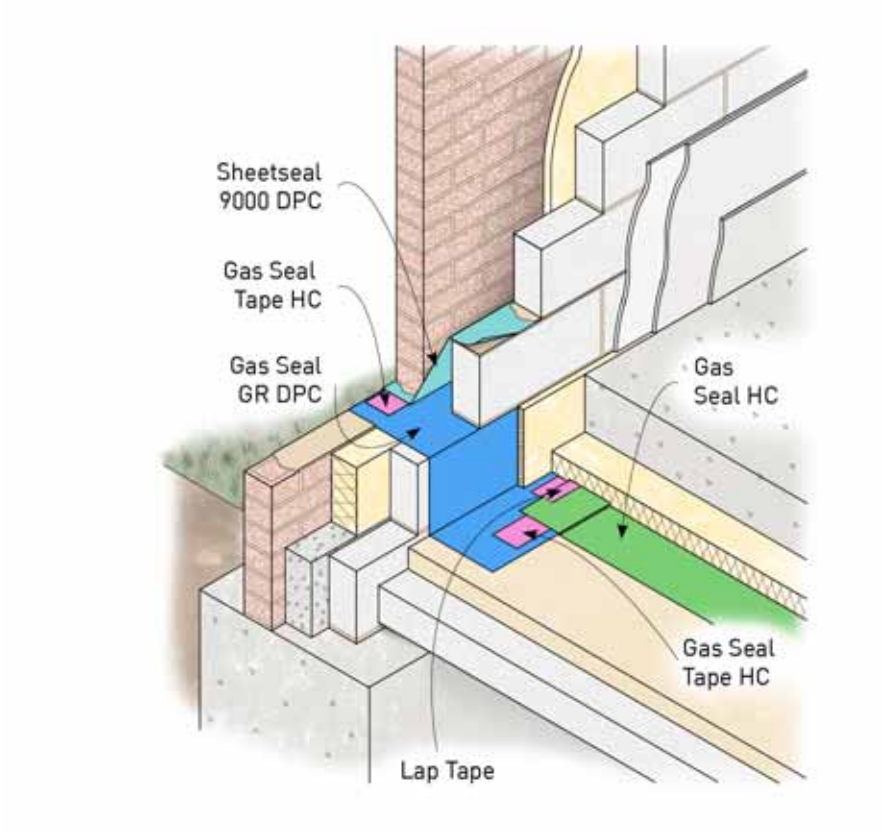
| | |
|---|---|
| Gas Seal HC | 2.0m wide x 50m long roll |

### STORAGE

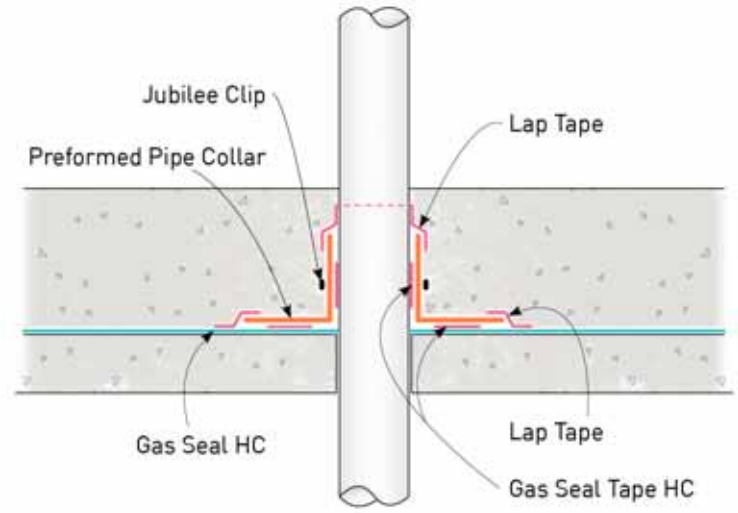
The rolls must be stacked on a flat surface, kept under cover and protected from sunlight and mechanical damage.

## TECHNICAL SERVICES

The Technical Department is available to advise on individual projects and to prepare or assist in the preparation of specifications and drawings. We can also offer design guidance to satisfy the requirements




## Typical Ground Bearing Slab




## Pipe Penetration Detail

**Must be through main membrane and not coincide with joints.**

The information in this literature was correct at the time of going to press. However, we are committed to continually improving our products and reserve the right to change product specifications.

For the latest information, please consult RIW. Conditions of use are beyond our control, therefore we cannot warrant the results to be obtained.

**RIW**
Arc House, Terrace Road South, Binfield,
Bracknell, Berkshire, RG42 4PZ
Technical enquires tel: **01344 397777**
Commercial enquires tel: **01344 397788**
**www.riw.co.uk**

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# APPENDIX D

## IG IMPORTED SOILS REPORT

**Intégral Géotechnique**

Intégral House
7 Beddau Way
Castlegate Business Park
Caerphilly
CF83 2AX
Tel: 029 2080 7991
mail@integralgeotec.com

12494/PD/Rev A

22 October 2019

Waterstone Homes
Number One
Waterton Park
Bridgend
CF31 3PH

**For the attention of Mr Jon Dobbs**

Dear Sirs,

**Chemical Testing of Stockpiles, Phase 2 Heritage Park, Coed Darcy**

Further to your instruction to carry a chemical appraisal of two stockpiles of materials at the above site, these works have now been completed and we comment as follows:

This report (including all appendices to it and any subsequent addendums or correspondence) has been prepared for the sole benefit, use and information of Waterstone Homes and no third party is entitled or permitted to rely on it. This report may not be used, reproduced or circulated (in whole or part) for any purpose without the written consent of Intégral Géotechnique (Wales) Limited. Intégral Géotechnique (Wales) Limited shall not be liable to any third party who does not have such express written permission to rely on the report for any losses they may suffer.

***Background***

Previously approximately 5000m$^3$ of granular soils were imported to the above site from the wider Coed Darcy development. Due to the suspected source of the soils being from a potentially contaminated former refinery site, the suitability of the materials for reuse on site was not known. Hence wide-ranging contamination testing was undertaken to establish the chemical suitability of the materials for reuse on site.

The chemical testing included for heavy metals, speciated PAHs, asbestos, volatile organic compounds, semi volatile organic compounds, Speciated TPH (aromatic and aliphatic split) and BTEX compounds.

The sampling was carried by a suitably qualified Geotechnical Engineer who utilised a tracked excavator to take samples from the stockpiles at various depths within the stockpile. The sampling was taken at a frequency of approximately 1 sample per 250m$^3$. Hence a total of 20 samples were dispatched to the UKAS accredited laboratories of i2 Analytical by courier with 24 hours of the samples having been taken.

The stockpiled materials were all observed to be brown loam and clay with sand, gravel and stone inclusions. No heterogeneous materials were noted within the stockpiles. The stockpiles sample descriptions for the laboratory tests results confirm this assessment of the materials. Refer of page 18 of 20 of the laboratory testing results. The approximate locations of the samples relative to the existing stockpiles are shown on Figure 1.

***Chemical Testing***

The chemical test results indicate that 19 out of the 20 samples did not have any elevated levels of contaminants which exceeded the adopted soil screening values based on a residential with homegrown produce end use. In addition, none of the samples screened for asbestos recorded a positive result.

The only exceedance recorded was in sample S17 where a very slight elevated exceedance of beryllium at1.9mg/kg was identified above the screening value for residential with homegrown produce end use of 1.7mg/kg.

The results of this latest soil stockpile chemical testing are shown in Appendix A, with the results of the analysis relative to the published residential with home grown produce screening values presented in Appendix B.

Given that a single elevated beryllium concentration has been recorded, we have implemented the use of the ESI Contaminated Land Statistics Calculator developed by Environmental Simulations International (ESI) Limited to further assess the results. As the stockpiled materials all exhibited the same physical and chemical characteristics it is considered reasonable to consider them as one averaging area for the purpose of statistical assessment.

The results of the beryllium testing have been compared to a critical concentration and statistical analysis undertaken to produce an Upper Confidence Limit ($UCL_{0.95}$), against which the soil contamination concentrations can be compared. If the Upper Confidence Limit (set as a default at 95%) is achieved then the Null Hypothesis (i.e. the level of contamination is the same as, or greater than the critical concentration) can be rejected and no further analysis or remedial works are likely to be required at the site. If the Upper Confidence Limit is not achieved then either further statistical data is required (comprising further chemical laboratory analysis) or remedial action may be required, which in case would comprise not re-using the soils.

The statistical analysis has identified the elevated concentration of 1.9mg/kg from S17 as a statistical outlier. However, even when incorporating this outlier into the full set of results, the evidence against the null hypothesis is recorded at 99%, thus the null hypothesis can be rejected. A copy of the statistical analysis for beryllium is presented in Appendix C.

Consequently, the stockpile(s) of materials tested as part of this investigation are deemed suitable for re-use on site within a residential with homegrown produce end use scenario.

It should be noted that this analysis only pertains to those stockpiles sampled and as detailed on Figure 1. Care should be undertaken when handling materials such that the stockpiles do not become cross contaminated by other materials. Due to the course nature of the material in the stockpile, containing many oversized sandstone boulders. Hence the stockpile would need to be reprocessed where screening and crushing techniques may be required.

We trust that the above is to your satisfaction. However, if you have any queries or require any further information, please do not hesitate to contact us.

Yours faithfully,

D. P. Da

**D P Davies**
**For**
**Intégral Géotechnique (Wales) Limited**
Enc:

# Appendix A

# Chemical Test Results

4041

Environmental Science

**Peter Davies**
Integral Geotechnique
Integral House
7 Beddau Way
Castlegate Business Park
CF83 2AX

**t:** 02920807991
**f:** 02920862176
**e:** peterd@integralgeotec.com

i2 Analytical Ltd.
7 Woodshots Meadow,
Croxley Green
Business Park,
Watford,
Herts,
WD18 8YS

**t:** 01923 225404
**f:** 01923 237404
**e:** reception@i2analytical.com

# Analytical Report Number : 19-60629

| | | | |
|---|---|---|---|
| **Project / Site name:** | Coed Darcy | **Samples received on:** | 20/09/2019 |
| **Your job number:** | 12494-PD | **Samples instructed on:** | 20/09/2019 |
| **Your order number:** | | **Analysis completed by:** | 30/09/2019 |
| **Report Issue Number:** | 1 | **Report issued on:** | 30/09/2019 |
| **Samples Analysed:** | 20 soil samples | | |

**Signed:** Karolina Marek

Karolina Marek
Technical Reviewer (Reporting Team)
**For & on behalf of i2 Analytical Ltd.**

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

| | |
|---|---|
| soils | - 4 weeks from reporting |
| leachates | - 2 weeks from reporting |
| waters | - 2 weeks from reporting |
| asbestos | - 6 months from reporting |

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Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**
**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320924 | 1320925 | 1320926 | 1320927 | 1320928 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S1 | S2 | S3 | S4 | S5 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.50 | 1.50 | 3.00 | 1.00 | 2.00 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | 34 | 21 | 39 | 10 |
| Moisture Content | % | N/A | NONE | 8.1 | 6.4 | 5.5 | 5.1 | 6.8 |
| Total mass of sample received | kg | 0.001 | NONE | 0.94 | 1.0 | 1.2 | 1.2 | 1.1 |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| **General Inorganics** | | | | | | | | |
| pH - Automated | pH Units | N/A | MCERTS | 8.3 | 7.8 | 8.4 | 8.2 | 8.1 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1 | < 1 | < 1 | < 1 | < 1 |
| Total Sulphate as $SO_4$ | mg/kg | 50 | MCERTS | 340 | 120 | 330 | 160 | 250 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.066 | 0.016 | 0.10 | 0.018 | 0.059 |
| Sulphide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Sulphur | mg/kg | 50 | MCERTS | 170 | 71 | 180 | 110 | 150 |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 1.2 | 0.9 | 1.0 | 1.1 | 1.2 |
| Loss on Ignition @ 450°C | % | 0.2 | MCERTS | 3.6 | 2.0 | 2.2 | 2.2 | 2.6 |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | < 0.80 | < 0.80 | < 0.80 | < 0.80 | < 0.80 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320924 | 1320925 | 1320926 | 1320927 | 1320928 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S1 | S2 | S3 | S4 | S5 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.50 | 1.50 | 3.00 | 1.00 | 2.00 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 16 | 8.6 | 11 | 7.1 | 4.5 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 0.67 | 0.71 | 0.94 | 0.70 | 0.72 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.5 | 0.3 | 0.4 | 0.2 | 0.2 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | 0.4 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 19 | 17 | 17 | 17 | 15 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 61 | 16 | 10 | 14 | 13 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 94 | 24 | 22 | 14 | 23 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 29 | 36 | 41 | 29 | 28 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 18 | 17 | 17 | 15 | 17 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 170 | 76 | 75 | 69 | 73 |
| **Monoaromatics & Oxygenates** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC16 - EC35 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aliphatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH-CWG - Aliphatic (EC5 - EC44)** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC35 - EC40 | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH-CWG - Aromatic (EC5 - EC44)** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH Total C5 - C44** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |



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**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320924 | 1320925 | 1320926 | 1320927 | 1320928 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S1 | S2 | S3 | S4 | S5 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.50 | 1.50 | 3.00 | 1.00 | 2.00 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| VOCs | | | | | | | | |
| Chloromethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloroethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromomethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vinyl Chloride | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichlorofluoromethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloro 1,2,2-Trifluoroethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Cis-1,2-dichloroethene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 2,2-Dichloropropane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,1-Trichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloropropene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,2-dichloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloropropane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloroethene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dibromomethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromodichloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Cis-1,3-dichloropropene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,3-dichloropropene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Dichloropropane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dibromochloromethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dibromoethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,1,2-Tetrachloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-Xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tribromomethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2,2-Tetrachloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Isopropylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| n-Propylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 2-Chlorotoluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 4-Chlorotoluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3,5-Trimethylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| tert-Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,4-Trimethylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| sec-Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Dichlorobenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p-Isopropyltoluene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,4-Dichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dibromo-3-chloropropane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,4-Trichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Hexachlorobutadiene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,3-Trichlorobenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |



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**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320924 | 1320925 | 1320926 | 1320927 | 1320928 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S1 | S2 | S3 | S4 | S5 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.50 | 1.50 | 3.00 | 1.00 | 2.00 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| SVOCs | | | | | | | | |
| Aniline | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenol | mg/kg | 0.2 | ISO 17025 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Chlorophenol | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Bis(2-chloroethyl)ether | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 1,3-Dichlorobenzene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 1,2-Dichlorobenzene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 1,4-Dichlorobenzene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Bis(2-chloroisopropyl)ether | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2-Methylphenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Hexachloroethane | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Nitrobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 4-Methylphenol | mg/kg | 0.2 | NONE | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Isophorone | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Nitrophenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 2,4-Dimethylphenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Bis(2-chloroethoxy)methane | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 1,2,4-Trichlorobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 2,4-Dichlorophenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 4-Chloroaniline | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Hexachlorobutadiene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 4-Chloro-3-methylphenol | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,4,6-Trichlorophenol | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,4,5-Trichlorophenol | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Methylnaphthalene | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2-Chloronaphthalene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dimethylphthalate | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,6-Dinitrotoluene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 2,4-Dinitrotoluene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Dibenzofuran | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 4-Chlorophenyl phenyl ether | mg/kg | 0.3 | ISO 17025 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Diethyl phthalate | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 4-Nitroaniline | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Azobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Bromophenyl phenyl ether | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Hexachlorobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Carbazole | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Dibutyl phthalate | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Anthraquinone | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Butyl benzyl phthalate | mg/kg | 0.3 | ISO 17025 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320929 | 1320930 | 1320931 | 1320932 | 1320933 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S6 | S7 | S8 | S9 | S10 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.50 | 2.00 | 1.00 | 0.50 | 1.50 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| Stone Content | % | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Moisture Content | % | N/A | NONE | 8.3 | 8.7 | 8.2 | 11 | 8.3 |
| Total mass of sample received | kg | 0.001 | NONE | 1.1 | 1.0 | 1.1 | 1.0 | 1.2 |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| **General Inorganics** | | | | | | | | |
| pH - Automated | pH Units | N/A | MCERTS | 8.1 | 8.7 | 8.2 | 7.6 | 8.1 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1 | < 1 | < 1 | < 1 | < 1 |
| Total Sulphate as $SO_4$ | mg/kg | 50 | MCERTS | 180 | 630 | 460 | 270 | 570 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.025 | 0.11 | 0.040 | 0.013 | 0.079 |
| Sulphide | mg/kg | 1 | MCERTS | < 1.0 | 45 | < 1.0 | < 1.0 | < 1.0 |
| Total Sulphur | mg/kg | 50 | MCERTS | 96 | 410 | 270 | 150 | 500 |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 0.9 | 1.2 | 1.4 | 1.2 | 1.1 |
| Loss on Ignition @ 450°C | % | 0.2 | MCERTS | 2.9 | 3.5 | 3.5 | 3.4 | 2.8 |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.29 | < 0.05 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.36 | < 0.05 | 0.44 |
| Pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.42 | < 0.05 | 0.45 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.17 | < 0.05 | 0.22 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.34 | < 0.05 | 0.27 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.29 | < 0.05 | 0.24 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.13 | < 0.05 | 0.12 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.17 | < 0.05 | 0.16 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | < 0.80 | < 0.80 | 2.17 | < 0.80 | 1.90 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320929 | 1320930 | 1320931 | 1320932 | 1320933 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S6 | S7 | S8 | S9 | S10 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.50 | 2.00 | 1.00 | 0.50 | 1.50 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 14 | 7.9 | 20 | 14 | 16 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 0.65 | 0.82 | 0.80 | 0.60 | 0.91 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.4 | 0.4 | 0.5 | 0.4 | 0.8 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | 0.3 | 0.4 | < 0.2 | 0.3 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 15 | 17 | 21 | 18 | 16 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 15 | 35 | 69 | 39 | 36 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 20 | 29 | 66 | 32 | 55 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 26 | 25 | 29 | 24 | 26 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 18 | 20 | 22 | 21 | 17 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 75 | 120 | 210 | 100 | 160 |
| **Monoaromatics & Oxygenates** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC16 - EC35 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aliphatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH-CWG - Aliphatic (EC5 - EC44)** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC35 - EC40 | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH-CWG - Aromatic (EC5 - EC44)** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH Total C5 - C44** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320929 | 1320930 | 1320931 | 1320932 | 1320933 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S6 | S7 | S8 | S9 | S10 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.50 | 2.00 | 1.00 | 0.50 | 1.50 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| VOCs | | | | | | | | |
| Chloromethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloroethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromomethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vinyl Chloride | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichlorofluoromethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloro 1,2,2-Trifluoroethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Cis-1,2-dichloroethene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 2,2-Dichloropropane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,1-Trichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloropropene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,2-dichloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloropropane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloroethene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dibromomethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromodichloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Cis-1,3-dichloropropene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,3-dichloropropene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Dichloropropane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dibromochloromethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dibromoethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,1,2-Tetrachloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-Xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tribromomethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2,2-Tetrachloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Isopropylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| n-Propylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 2-Chlorotoluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 4-Chlorotoluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3,5-Trimethylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| tert-Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,4-Trimethylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| sec-Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Dichlorobenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p-Isopropyltoluene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,4-Dichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dibromo-3-chloropropane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,4-Trichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Hexachlorobutadiene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,3-Trichlorobenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320929 | 1320930 | 1320931 | 1320932 | 1320933 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S6 | S7 | S8 | S9 | S10 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 0.50 | 2.00 | 1.00 | 0.50 | 1.50 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| SVOCs | | | | | | | | |
| Aniline | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenol | mg/kg | 0.2 | ISO 17025 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Chlorophenol | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Bis(2-chloroethyl)ether | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 1,3-Dichlorobenzene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 1,2-Dichlorobenzene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 1,4-Dichlorobenzene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Bis(2-chloroisopropyl)ether | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2-Methylphenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Hexachloroethane | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Nitrobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 4-Methylphenol | mg/kg | 0.2 | NONE | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Isophorone | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Nitrophenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 2,4-Dimethylphenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Bis(2-chloroethoxy)methane | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 1,2,4-Trichlorobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 2,4-Dichlorophenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 4-Chloroaniline | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Hexachlorobutadiene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 4-Chloro-3-methylphenol | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,4,6-Trichlorophenol | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,4,5-Trichlorophenol | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Methylnaphthalene | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2-Chloronaphthalene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dimethylphthalate | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,6-Dinitrotoluene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 2,4-Dinitrotoluene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Dibenzofuran | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 4-Chlorophenyl phenyl ether | mg/kg | 0.3 | ISO 17025 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Diethyl phthalate | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 4-Nitroaniline | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Azobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Bromophenyl phenyl ether | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Hexachlorobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.29 | < 0.05 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Carbazole | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Dibutyl phthalate | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Anthraquinone | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.36 | < 0.05 | 0.44 |
| Pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.42 | < 0.05 | 0.45 |
| Butyl benzyl phthalate | mg/kg | 0.3 | ISO 17025 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.17 | < 0.05 | 0.22 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.34 | < 0.05 | 0.27 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.29 | < 0.05 | 0.24 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.13 | < 0.05 | 0.12 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | 0.17 | < 0.05 | 0.16 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320934 | 1320935 | 1320936 | 1320937 | 1320938 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S11 | S12 | S13 | S14 | S15 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 1.00 | 4.00 | 2.00 | 0.50 | 1.50 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | Units | Limit of detection | Accreditation Status | | | | | |
| Stone Content | % | 0.1 | NONE | 30 | < 0.1 | 30 | < 0.1 | 21 |
| Moisture Content | % | N/A | NONE | 5.4 | 8.0 | 5.8 | 6.8 | 6.2 |
| Total mass of sample received | kg | 0.001 | NONE | 0.97 | 1.3 | 1.0 | 1.0 | 0.99 |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| **General Inorganics** | | | | | | | | |
| pH - Automated | pH Units | N/A | MCERTS | 7.8 | 8.0 | 8.0 | 7.9 | 7.6 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1 | < 1 | < 1 | < 1 | < 1 |
| Total Sulphate as $SO_4$ | mg/kg | 50 | MCERTS | 210 | 160 | 370 | 640 | 890 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.075 | 0.037 | 0.075 | 0.12 | 0.36 |
| Sulphide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Sulphur | mg/kg | 50 | MCERTS | 160 | 100 | 230 | 280 | 510 |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 0.9 | 1.2 | 1.4 | 2.3 | 2.2 |
| Loss on Ignition @ 450°C | % | 0.2 | MCERTS | 2.2 | 2.5 | 2.8 | 4.4 | 4.0 |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | < 0.80 | < 0.80 | < 0.80 | < 0.80 | < 0.80 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320934 | 1320935 | 1320936 | 1320937 | 1320938 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S11 | S12 | S13 | S14 | S15 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 1.00 | 4.00 | 2.00 | 0.50 | 1.50 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 5.8 | 2.7 | 5.8 | 8.6 | 6.1 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 1.1 | 0.86 | 0.90 | 0.94 | 0.99 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.3 | 0.3 | 0.4 | 0.7 | 0.5 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 16 | 17 | 17 | 23 | 20 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 9.5 | 15 | 24 | 47 | 24 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 16 | 15 | 26 | 18 | 17 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 45 | 33 | 30 | 30 | 38 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 16 | 18 | 18 | 21 | 20 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 75 | 69 | 92 | 76 | 76 |
| **Monoaromatics & Oxygenates** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC16 - EC35 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aliphatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH-CWG - Aliphatic (EC5 - EC44)** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC35 - EC40 | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH-CWG - Aromatic (EC5 - EC44)** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH Total C5 - C44** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |



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**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320934 | 1320935 | 1320936 | 1320937 | 1320938 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S11 | S12 | S13 | S14 | S15 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 1.00 | 4.00 | 2.00 | 0.50 | 1.50 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| VOCs | | | | | | | | |
| Chloromethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloroethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromomethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vinyl Chloride | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichlorofluoromethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloro 1,2,2-Trifluoroethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Cis-1,2-dichloroethene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 2,2-Dichloropropane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,1-Trichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloropropene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,2-dichloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloropropane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloroethene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dibromomethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromodichloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Cis-1,3-dichloropropene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,3-dichloropropene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Dichloropropane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dibromochloromethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dibromoethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,1,2-Tetrachloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-Xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tribromomethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2,2-Tetrachloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Isopropylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| n-Propylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 2-Chlorotoluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 4-Chlorotoluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3,5-Trimethylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| tert-Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,4-Trimethylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| sec-Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Dichlorobenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p-Isopropyltoluene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,4-Dichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dibromo-3-chloropropane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,4-Trichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Hexachlorobutadiene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,3-Trichlorobenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320934 | 1320935 | 1320936 | 1320937 | 1320938 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S11 | S12 | S13 | S14 | S15 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 1.00 | 4.00 | 2.00 | 0.50 | 1.50 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| SVOCs | | | | | | | | |
| Aniline | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenol | mg/kg | 0.2 | ISO 17025 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Chlorophenol | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Bis(2-chloroethyl)ether | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 1,3-Dichlorobenzene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 1,2-Dichlorobenzene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 1,4-Dichlorobenzene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Bis(2-chloroisopropyl)ether | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2-Methylphenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Hexachloroethane | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Nitrobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 4-Methylphenol | mg/kg | 0.2 | NONE | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Isophorone | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Nitrophenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 2,4-Dimethylphenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Bis(2-chloroethoxy)methane | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 1,2,4-Trichlorobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 2,4-Dichlorophenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 4-Chloroaniline | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Hexachlorobutadiene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 4-Chloro-3-methylphenol | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,4,6-Trichlorophenol | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,4,5-Trichlorophenol | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Methylnaphthalene | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2-Chloronaphthalene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dimethylphthalate | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,6-Dinitrotoluene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 2,4-Dinitrotoluene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Dibenzofuran | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 4-Chlorophenyl phenyl ether | mg/kg | 0.3 | ISO 17025 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Diethyl phthalate | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 4-Nitroaniline | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Azobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Bromophenyl phenyl ether | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Hexachlorobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Carbazole | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Dibutyl phthalate | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Anthraquinone | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Butyl benzyl phthalate | mg/kg | 0.3 | ISO 17025 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**
**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320939 | 1320940 | 1320941 | 1320942 | 1320943 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S16 | S17 | S18 | S19 | S20 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 3.50 | 0.10 | 2.50 | 0.10 | 0.10 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| Stone Content | % | 0.1 | NONE | 56 | 30 | 27 | < 0.1 | < 0.1 |
| Moisture Content | % | N/A | NONE | 5.9 | 5.9 | 8.6 | 3.1 | 4.2 |
| Total mass of sample received | kg | 0.001 | NONE | 0.87 | 1.0 | 0.94 | 0.80 | 1.0 |
| Asbestos in Soil | Type | N/A | ISO 17025 | Not-detected | Not-detected | Not-detected | Not-detected | Not-detected |
| **General Inorganics** | | | | | | | | |
| pH - Automated | pH Units | N/A | MCERTS | 7.8 | 7.9 | 7.8 | 8.3 | 8.2 |
| Total Cyanide | mg/kg | 1 | MCERTS | < 1 | < 1 | < 1 | < 1 | < 1 |
| Total Sulphate as $SO_4$ | mg/kg | 50 | MCERTS | 410 | 370 | 720 | 430 | 320 |
| Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent) | g/l | 0.00125 | MCERTS | 0.064 | 0.071 | 0.12 | 0.057 | 0.032 |
| Sulphide | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Total Sulphur | mg/kg | 50 | MCERTS | 270 | 370 | 320 | 260 | 160 |
| Total Organic Carbon (TOC) | % | 0.1 | MCERTS | 1.6 | 2.2 | 1.5 | 1.0 | 1.0 |
| Loss on Ignition @ 450°C | % | 0.2 | MCERTS | 3.5 | 5.0 | 2.9 | 2.5 | 2.6 |
| **Total Phenols** | | | | | | | | |
| Total Phenols (monohydric) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Speciated PAHs** | | | | | | | | |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| **Total PAH** | | | | | | | | |
| Speciated Total EPA-16 PAHs | mg/kg | 0.8 | MCERTS | < 0.80 | < 0.80 | < 0.80 | < 0.80 | < 0.80 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**

**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320939 | 1320940 | 1320941 | 1320942 | 1320943 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S16 | S17 | S18 | S19 | S20 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 3.50 | 0.10 | 2.50 | 0.10 | 0.10 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| **Heavy Metals / Metalloids** | | | | | | | | |
| Arsenic (aqua regia extractable) | mg/kg | 1 | MCERTS | 13 | 27 | 2.7 | 15 | 6.9 |
| Beryllium (aqua regia extractable) | mg/kg | 0.06 | MCERTS | 1.1 | 1.9 | 0.75 | 0.80 | 0.54 |
| Boron (water soluble) | mg/kg | 0.2 | MCERTS | 0.4 | 0.2 | 0.6 | 0.5 | 0.6 |
| Cadmium (aqua regia extractable) | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | 0.2 | < 0.2 |
| Chromium (hexavalent) | mg/kg | 4 | MCERTS | < 4.0 | < 4.0 | < 4.0 | < 4.0 | < 4.0 |
| Chromium (aqua regia extractable) | mg/kg | 1 | MCERTS | 19 | 16 | 17 | 18 | 16 |
| Copper (aqua regia extractable) | mg/kg | 1 | MCERTS | 21 | 27 | 35 | 28 | 24 |
| Lead (aqua regia extractable) | mg/kg | 1 | MCERTS | 19 | 30 | 19 | 42 | 15 |
| Mercury (aqua regia extractable) | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Nickel (aqua regia extractable) | mg/kg | 1 | MCERTS | 36 | 51 | 25 | 26 | 21 |
| Selenium (aqua regia extractable) | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vanadium (aqua regia extractable) | mg/kg | 1 | MCERTS | 19 | 24 | 20 | 20 | 18 |
| Zinc (aqua regia extractable) | mg/kg | 1 | MCERTS | 77 | 90 | 75 | 100 | 69 |
| **Monoaromatics & Oxygenates** | | | | | | | | |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| **Petroleum Hydrocarbons** | | | | | | | | |
| TPH-CWG - Aliphatic >EC5 - EC6 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC6 - EC8 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC8 - EC10 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aliphatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aliphatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aliphatic >EC16 - EC21 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC21 - EC35 | mg/kg | 8 | MCERTS | < 8.0 | < 8.0 | < 8.0 | < 8.0 | < 8.0 |
| TPH-CWG - Aliphatic >EC16 - EC35 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aliphatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aliphatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH-CWG - Aliphatic (EC5 - EC44)** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC5 - EC7 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC7 - EC8 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC8 - EC10 | mg/kg | 0.001 | MCERTS | < 0.001 | < 0.001 | < 0.001 | < 0.001 | < 0.001 |
| TPH-CWG - Aromatic >EC10 - EC12 | mg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| TPH-CWG - Aromatic >EC12 - EC16 | mg/kg | 2 | MCERTS | < 2.0 | < 2.0 | < 2.0 | < 2.0 | < 2.0 |
| TPH-CWG - Aromatic >EC16 - EC21 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC21 - EC35 | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic >EC35 - EC40 | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| TPH-CWG - Aromatic > EC35 - EC44 | mg/kg | 8.4 | NONE | < 8.4 | < 8.4 | < 8.4 | < 8.4 | < 8.4 |
| **TPH-CWG - Aromatic (EC5 - EC35)** | mg/kg | 10 | MCERTS | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH-CWG - Aromatic (EC5 - EC44)** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |
| **TPH Total C5 - C44** | mg/kg | 10 | NONE | < 10 | < 10 | < 10 | < 10 | < 10 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**
**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320939 | 1320940 | 1320941 | 1320942 | 1320943 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S16 | S17 | S18 | S19 | S20 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 3.50 | 0.10 | 2.50 | 0.10 | 0.10 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| **Analytical Parameter (Soil Analysis)** | **Units** | **Limit of detection** | **Accreditation Status** | | | | | |
| VOCs | | | | | | | | |
| Chloromethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chloroethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromomethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Vinyl Chloride | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichlorofluoromethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloro 1,2,2-Trifluoroethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Cis-1,2-dichloroethene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| MTBE (Methyl Tertiary Butyl Ether) | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 2,2-Dichloropropane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,1-Trichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1-Dichloropropene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,2-dichloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Benzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichloropropane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trichloroethene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dibromomethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromodichloromethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Cis-1,3-dichloropropene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Trans-1,3-dichloropropene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Toluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2-Trichloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Dichloropropane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Dibromochloromethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tetrachloroethene | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dibromoethane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Chlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,1,2-Tetrachloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Ethylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p & m-Xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Styrene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Tribromomethane | µg/kg | 1 | NONE | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| o-Xylene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,1,2,2-Tetrachloroethane | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Isopropylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Bromobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| n-Propylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 2-Chlorotoluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 4-Chlorotoluene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3,5-Trimethylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| tert-Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,4-Trimethylbenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| sec-Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,3-Dichlorobenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| p-Isopropyltoluene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,4-Dichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Butylbenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2-Dibromo-3-chloropropane | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,4-Trichlorobenzene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| Hexachlorobutadiene | µg/kg | 1 | MCERTS | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |
| 1,2,3-Trichlorobenzene | µg/kg | 1 | ISO 17025 | < 1.0 | < 1.0 | < 1.0 | < 1.0 | < 1.0 |



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The results included within the report are representative of the samples submitted for analysis.

**Analytical Report Number: 19-60629**
**Project / Site name: Coed Darcy**

| Lab Sample Number | | | | 1320939 | 1320940 | 1320941 | 1320942 | 1320943 |
|---|---|---|---|---|---|---|---|---|
| Sample Reference | | | | S16 | S17 | S18 | S19 | S20 |
| Sample Number | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Depth (m) | | | | 3.50 | 0.10 | 2.50 | 0.10 | 0.10 |
| Date Sampled | | | | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 | 18/09/2019 |
| Time Taken | | | | None Supplied | None Supplied | None Supplied | None Supplied | None Supplied |
| Analytical Parameter (Soil Analysis) | Units | Limit of detection | Accreditation Status | | | | | |
| SVOCs | | | | | | | | |
| Aniline | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Phenol | mg/kg | 0.2 | ISO 17025 | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Chlorophenol | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Bis(2-chloroethyl)ether | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 1,3-Dichlorobenzene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 1,2-Dichlorobenzene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 1,4-Dichlorobenzene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Bis(2-chloroisopropyl)ether | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2-Methylphenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Hexachloroethane | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Nitrobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 4-Methylphenol | mg/kg | 0.2 | NONE | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Isophorone | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Nitrophenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 2,4-Dimethylphenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Bis(2-chloroethoxy)methane | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 1,2,4-Trichlorobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Naphthalene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 2,4-Dichlorophenol | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| 4-Chloroaniline | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Hexachlorobutadiene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 4-Chloro-3-methylphenol | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,4,6-Trichlorophenol | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,4,5-Trichlorophenol | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 2-Methylnaphthalene | mg/kg | 0.1 | NONE | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2-Chloronaphthalene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Dimethylphthalate | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| 2,6-Dinitrotoluene | mg/kg | 0.1 | MCERTS | < 0.1 | < 0.1 | < 0.1 | < 0.1 | < 0.1 |
| Acenaphthylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Acenaphthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 2,4-Dinitrotoluene | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Dibenzofuran | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 4-Chlorophenyl phenyl ether | mg/kg | 0.3 | ISO 17025 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Diethyl phthalate | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| 4-Nitroaniline | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Fluorene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Azobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Bromophenyl phenyl ether | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Hexachlorobenzene | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Phenanthrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Carbazole | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Dibutyl phthalate | mg/kg | 0.2 | MCERTS | < 0.2 | < 0.2 | < 0.2 | < 0.2 | < 0.2 |
| Anthraquinone | mg/kg | 0.3 | MCERTS | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Butyl benzyl phthalate | mg/kg | 0.3 | ISO 17025 | < 0.3 | < 0.3 | < 0.3 | < 0.3 | < 0.3 |
| Benzo(a)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Chrysene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(b)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(k)fluoranthene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(a)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Indeno(1,2,3-cd)pyrene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Dibenz(a,h)anthracene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| Benzo(ghi)perylene | mg/kg | 0.05 | MCERTS | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |



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**Analytical Report Number : 19-60629**

**Project / Site name: Coed Darcy**

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and loam (MCERTS) soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

| Lab Sample Number | Sample Reference | Sample Number | Depth (m) | Sample Description * |
|---|---|---|---|---|
| 1320924 | S1 | None Supplied | 0.50 | Brown gravelly sand with vegetation. |
| 1320925 | S2 | None Supplied | 1.50 | Brown loam and clay with gravel and stones. |
| 1320926 | S3 | None Supplied | 3.00 | Brown loam and sand with gravel and stones. |
| 1320927 | S4 | None Supplied | 1.00 | Brown loam and clay with gravel and stones. |
| 1320928 | S5 | None Supplied | 2.00 | Brown loam and clay with gravel and stones. |
| 1320929 | S6 | None Supplied | 0.50 | Brown clay and sand with gravel. |
| 1320930 | S7 | None Supplied | 2.00 | Brown clay and sand with gravel. |
| 1320931 | S8 | None Supplied | 1.00 | Brown loam and clay with gravel and vegetation. |
| 1320932 | S9 | None Supplied | 0.50 | Brown loam and clay with gravel and vegetation. |
| 1320933 | S10 | None Supplied | 1.50 | Brown loam and clay with gravel. |
| 1320934 | S11 | None Supplied | 1.00 | Brown loam and clay with gravel and stones. |
| 1320935 | S12 | None Supplied | 4.00 | Brown clay and sand. |
| 1320936 | S13 | None Supplied | 2.00 | Brown loam and clay with gravel and stones. |
| 1320937 | S14 | None Supplied | 0.50 | Brown loam and sand with gravel. |
| 1320938 | S15 | None Supplied | 1.50 | Brown loam and sand with gravel and stones. |
| 1320939 | S16 | None Supplied | 3.50 | Brown loam and clay with gravel and stones. |
| 1320940 | S17 | None Supplied | 0.10 | Brown loam and sand with gravel and stones. |
| 1320941 | S18 | None Supplied | 2.50 | Brown loam and clay with gravel and stones. |
| 1320942 | S19 | None Supplied | 0.10 | Brown loam and sand with gravel. |
| 1320943 | S20 | None Supplied | 0.10 | Brown loam and sand with gravel. |



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**Analytical Report Number : 19-60629**

**Project / Site name: Coed Darcy**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Asbestos identification in soil | Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques. | In house method based on HSG 248 | A001-PL | D | ISO 17025 |
| Boron, water soluble, in soil | Determination of water soluble boron in soil by hot water extract followed by ICP-OES. | In-house method based on Second Site Properties version 3 | L038-PL | D | MCERTS |
| BTEX and MTBE in soil (Monoaromatics) | Determination of BTEX in soil by headspace GC-MS. | In-house method based on USEPA8260 | L073B-PL | W | MCERTS |
| Hexavalent chromium in soil | Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry. | In-house method | L080-PL | W | MCERTS |
| Loss on ignition of soil @ 450oC | Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L047-PL | D | MCERTS |
| Metals in soil by ICP-OES | Determination of metals in soil by aqua-regia digestion followed by ICP-OES. | In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil. | L038-PL | D | MCERTS |
| Moisture Content | Moisture content, determined gravimetrically. | In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests | L019-UK/PL | W | NONE |
| Monohydric phenols in soil | Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar) | L080-PL | W | MCERTS |
| pH in soil (automated) | Determination of pH in soil by addition of water followed by automated electrometric measurement. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L099-PL | D | MCERTS |
| Semi-volatile organic compounds in soil | Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS. | In-house method based on USEPA 8270 | L064-PL | D | MCERTS |
| Speciated EPA-16 PAHs in soil | Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards. | In-house method based on USEPA 8270 | L064-PL | D | MCERTS |
| Stones content of soil | Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight. | In-house method based on British Standard Methods and MCERTS requirements. | L019-UK/PL | D | NONE |
| Sulphate, water soluble, in soil (16hr extraction) | Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent). | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES. | L038-PL | D | MCERTS |
| Sulphide in soil | Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode. | In-house method | L010-PL | D | MCERTS |
| Total cyanide in soil | Determination of total cyanide by distillation followed by colorimetry. | In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar) | L080-PL | W | MCERTS |
| Total organic carbon (Automated) in soil | Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests** | L009-PL | D | MCERTS |
| Total sulphate (as SO4 in soil) | Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES. | In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests | L038-PL | D | MCERTS |



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The results included within the report are representative of the samples submitted for analysis.

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Environmental Science

**Analytical Report Number : 19-60629**

**Project / Site name: Coed Darcy**

**Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW) Process Water (PrW)**

| Analytical Test Name | Analytical Method Description | Analytical Method Reference | Method number | Wet / Dry Analysis | Accreditation Status |
|---|---|---|---|---|---|
| Total Sulphur in soil | Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES. | In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil | L038-PL | D | MCERTS |
| TPH in (Soil) | Determination of TPH bands by HS-GC-MS/GC-FID | In-house method, TPH with carbon banding and silica gel split/cleanup. | L076-PL | D | NONE |
| TPHCWG (Soil) | Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID. | In-house method with silica gel split/clean up. | L088/76-PL | W | MCERTS |
| Volatile organic compounds in soil | Determination of volatile organic compounds in soil by headspace GC-MS. | In-house method based on USEPA8260 | L073B-PL | W | MCERTS |

**For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.**
**For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.**
**Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30oC.**



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The results included within the report are representative of the samples submitted for analysis.

# Appendix B

# Summary Tables of Chemical Test Results

## SUMMARY OF LABORATORY SOIL TEST RESULTS

### METALS AND SEMI-METALS

Job No.: 12494
Site: Coed Darcy
Soil Type: Made Ground
Soil Organic Matter: 1%

| No. | Location | Depth (m) | Arsenic (mg/kg) | Boron (mg/kg) | Beryllium (mg/kg) | Cadmium (mg/kg) | Chromium (mg/kg) | Chromium (VI) (mg/kg) | Copper (mg/kg) | Lead (mg/kg) | Mercury (Elemental) (mg/kg) | Nickel (mg/kg) | Selenium (mg/kg) | Vanadium (mg/kg) | Zinc (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | S1 | 0.50 | 16 | 0.5 | 0.67 | 0.4 | 19 | < 4.0 | 61 | 94 | < 0.3 | 29 | < 1.0 | 18 | 170 |
| 2 | S2 | 1.50 | 8.6 | 0.3 | 0.71 | < 0.2 | 17 | < 4.0 | 16 | 24 | < 0.3 | 36 | < 1.0 | 17 | 76 |
| 3 | S3 | 3.00 | 11 | 0.4 | 0.94 | < 0.2 | 17 | < 4.0 | 10 | 22 | < 0.3 | 41 | < 1.0 | 17 | 75 |
| 4 | S4 | 1.00 | 7.1 | 0.2 | 0.70 | < 0.2 | 17 | < 4.0 | 14 | 14 | < 0.3 | 29 | < 1.0 | 15 | 69 |
| 5 | S5 | 2.00 | 4.5 | 0.2 | 0.72 | < 0.2 | 15 | < 4.0 | 13 | 23 | < 0.3 | 28 | < 1.0 | 17 | 73 |
| 6 | S6 | 0.50 | 14 | 0.4 | 0.65 | < 0.2 | 15 | < 4.0 | 15 | 20 | < 0.3 | 26 | < 1.0 | 18 | 75 |
| 7 | S7 | 2.00 | 7.9 | 0.4 | 0.82 | 0.3 | 17 | < 4.0 | 35 | 29 | < 0.3 | 25 | < 1.0 | 20 | 120 |
| 8 | S8 | 1.00 | 20 | 0.5 | 0.80 | 0.4 | 21 | < 4.0 | 69 | 66 | < 0.3 | 29 | < 1.0 | 22 | 210 |
| 9 | S9 | 0.50 | 14 | 0.4 | 0.60 | < 0.2 | 18 | < 4.0 | 39 | 32 | < 0.3 | 24 | < 1.0 | 21 | 100 |
| 10 | S10 | 1.50 | 10 | 0.8 | 0.91 | 0.3 | 16 | < 4.0 | 36 | 55 | < 0.3 | 26 | < 1.0 | 17 | 160 |
| 11 | S11 | 1.00 | 5.8 | 0.3 | 1.1 | < 0.2 | 16 | < 4.0 | 9.5 | 16 | < 0.3 | 45 | < 1.0 | 16 | 75 |
| 12 | S12 | 4.00 | 2.7 | 0.3 | 0.86 | < 0.2 | 17 | < 4.0 | 15 | 15 | < 0.3 | 33 | < 1.0 | 18 | 69 |
| 13 | S13 | 2.00 | 5.8 | 0.4 | 0.90 | < 0.2 | 17 | < 4.0 | 24 | 26 | < 0.3 | 30 | < 1.0 | 18 | 92 |
| 14 | S14 | 0.50 | 8.6 | 0.7 | 0.94 | < 0.2 | 23 | < 4.0 | 47 | 18 | < 0.3 | 30 | < 1.0 | 21 | 76 |
| 15 | S15 | 1.50 | 6.1 | 0.5 | 0.99 | < 0.2 | 20 | < 4.0 | 24 | 17 | < 0.3 | 36 | < 1.0 | 20 | 76 |
| 16 | S16 | 3.50 | 13 | 0.4 | 1.1 | < 0.2 | 19 | < 4.0 | 21 | 19 | < 0.3 | 36 | < 1.0 | 19 | 77 |
| 17 | S17 | 0.10 | 27 | 0.2 | 1.9 | < 0.2 | 16 | < 4.0 | 27 | 30 | < 0.3 | 51 | < 1.0 | 24 | 90 |
| 18 | S18 | 2.50 | 2.7 | 0.6 | 0.75 | < 0.2 | 17 | < 4.0 | 35 | 19 | < 0.3 | 25 | < 1.0 | 20 | 75 |
| 19 | S19 | 0.10 | 15 | 0.5 | 0.80 | 0.2 | 18 | < 4.0 | 28 | 42 | < 0.3 | 26 | < 1.0 | 20 | 100 |
| 20 | S20 | 0.10 | 6.9 | 0.6 | 0.54 | < 0.2 | 16 | < 4.0 | 24 | 15 | < 0.3 | 21 | < 1.0 | 18 | 69 |
| | | | | | | | | | | | | | | | |
| | Screening Criteria Value | | 37.0 | 290.0 | 1.7 | 11.0 | - | 6.0 | 2400.0 | 200.0 | 1.2 | 130.0 | 250.0 | 410.0 | 3700.0 |
| | Source of Screening Criteria Value | | S4UL | S4UL | S4UL | S4UL | - | S4UL | S4UL | C4SL | S4UL | S4UL | S4UL | S4UL | S4UL |

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## SUMMARY OF LABORATORY SOIL TEST RESULTS

### INORGANIC CHEMICALS & OTHERS

Job No.: 12494
Site: Coed Darcy
Soil Type: Made Ground
Soil Organic Matter: 1%

| No. | Location | Depth (m) | Cyanide (mg/kg) | Loss on ignition, dried solids (%) | Moisture content at 30 C (%) | Phenol (mg/kg) | pH (pH units) | Water Soluble Sulphate (g/l) | Sulphate Total as SO4 (mg/kg) | Sulphide (mg/kg) | Total Sulphur (mg/kg) | TOC by Ignition in O2 (%) | Equivalent SOM (%) | Asbestos in Soil | Asbestos Quantification (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | S1 | 0.50 | < 1 | 3.60 | 8.1 | < 1.0 | 8.3 | 0.066 | 340 | < 1.0 | 170 | 1.2 | 2.06 | Not detected | #N/A |
| 2 | S2 | 1.50 | < 1 | 2.0 | 6.4 | < 1.0 | 7.8 | 0.016 | 120 | < 1.0 | 71 | 0.9 | 1.55 | Not detected | #N/A |
| 3 | S3 | 3.00 | < 1 | 2.2 | 5.5 | < 1.0 | 8.4 | 0.10 | 330 | < 1.0 | 180 | 1.0 | 1.72 | Not detected | #N/A |
| 4 | S4 | 1.00 | < 1 | 2.2 | 5.1 | < 1.0 | 8.2 | 0.018 | 160 | < 1.0 | 110 | 1.1 | 1.89 | Not detected | #N/A |
| 5 | S5 | 2.00 | < 1 | 2.6 | 6.8 | < 1.0 | 8.1 | 0.059 | 250 | < 1.0 | 150 | 1.2 | 2.06 | Not detected | #N/A |
| 6 | S6 | 0.50 | < 1 | 2.9 | 8.3 | < 1.0 | 8.1 | 0.025 | 180 | < 1.0 | 96 | 0.9 | 1.55 | Not detected | #N/A |
| 7 | S7 | 2.00 | < 1 | 3.5 | 8.7 | < 1.0 | 8.7 | 0.11 | 630 | 45 | 410 | 1.2 | 2.06 | Not detected | #N/A |
| 8 | S8 | 1.00 | < 1 | 3.5 | 8.2 | < 1.0 | 8.2 | 0.040 | 400 | < 1.0 | 270 | 1.4 | 2.41 | Not detected | #N/A |
| 9 | S9 | 0.50 | < 1 | 3.4 | 11 | < 1.0 | 7.6 | 0.013 | 270 | < 1.0 | 150 | 1.2 | 2.06 | Not detected | #N/A |
| 10 | S10 | 1.50 | < 1 | 2.8 | 8.3 | < 1.0 | 8.1 | 0.079 | 570 | < 1.0 | 500 | 1.1 | 1.89 | Not detected | #N/A |
| 11 | S11 | 1.00 | < 1 | 2.2 | 5.4 | < 1.0 | 7.8 | 0.075 | 210 | < 1.0 | 160 | 0.9 | 1.55 | Not detected | #N/A |
| 12 | S12 | 4.00 | < 1 | 2.5 | 8.0 | < 1.0 | 8.0 | 0.037 | 160 | < 1.0 | 100 | 1.2 | 2.06 | Not detected | #N/A |
| 13 | S13 | 2.00 | < 1 | 2.8 | 5.8 | < 1.0 | 8.0 | 0.075 | 370 | < 1.0 | 230 | 1.4 | 2.41 | Not detected | #N/A |
| 14 | S14 | 0.50 | < 1 | 4.4 | 6.6 | < 1.0 | 7.9 | 0.12 | 640 | < 1.0 | 280 | 2.3 | 3.96 | Not detected | #N/A |
| 15 | S15 | 1.50 | < 1 | 4.0 | 6.2 | < 1.0 | 7.6 | 0.36 | 890 | < 1.0 | 510 | 2.2 | 3.78 | Not detected | #N/A |
| 16 | S16 | 3.50 | < 1 | 3.5 | 5.9 | < 1.0 | 7.8 | 0.064 | 410 | < 1.0 | 270 | 1.6 | 2.75 | Not detected | #N/A |
| 17 | S17 | 0.10 | < 1 | 5.0 | 5.9 | < 1.0 | 7.9 | 0.071 | 370 | < 1.0 | 370 | 2.2 | 3.78 | Not detected | #N/A |
| 18 | S18 | 2.50 | < 1 | 2.9 | 8.6 | < 1.0 | 7.8 | 0.12 | 720 | < 1.0 | 320 | 1.5 | 2.58 | Not detected | #N/A |
| 19 | S19 | 0.10 | < 1 | 2.5 | 3.1 | < 1.0 | 8.3 | 0.057 | 430 | < 1.0 | 260 | 1.0 | 1.72 | Not detected | #N/A |
| 20 | S20 | 0.10 | < 1 | 2.6 | 4.2 | < 1.0 | 8.2 | 0.032 | 320 | < 1.0 | 160 | 1.0 | 1.72 | Not detected | #N/A |
| | | | | | | | | | | | | | | | |
| | Screening Criteria Value | | 34.0 | - | - | 280.0 | - | - | - | - | - | - | - | - | 0.001 |
| | Source of Screening Criteria Value | | ATRISK | - | - | S4UL | - | - | - | - | - | - | - | - | IOM |

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## SUMMARY OF LABORATORY SOIL TEST RESULTS

## POLYAROMATIC HYDROCARBONS (PAH)

Job No.: 12494
Site: Coed Darcy
Soil Type: Made Ground
Soil Organic Matter: 1%

| No. | Location | Depth (m) | Acenaphthene (mg/kg) | Acenaphthylene (mg/kg) | Anthracene (mg/kg) | Benzo[a]anthracene (mg/kg) | Benzo(a)pyrene (mg/kg) | Benzo(b)fluoranthene (mg/kg) | Benzo(ghi)perylene (mg/kg) | Benzo(k)fluoranthene (mg/kg) | Chrysene (mg/kg) | Dibenzo[ah]anthracene (mg/kg) | Fluoranthene (mg/kg) | Fluorene (mg/kg) | Indeno(123cd)pyrene (mg/kg) | Naphthalene (mg/kg) | Phenanthrene (mg/kg) | Pyrene (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | S1 | 0.50 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 2 | S2 | 1.50 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 3 | S3 | 3.00 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 4 | S4 | 1.00 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 5 | S5 | 2.00 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 6 | S6 | 0.50 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 7 | S7 | 2.00 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 8 | S8 | 1.00 | < 0.05 | < 0.05 | < 0.05 | 0.17 | 0.17 | 0.29 | < 0.05 | 0.13 | 0.34 | < 0.05 | 0.36 | < 0.05 | < 0.05 | < 0.05 | 0.29 | 0.42 |
| 9 | S9 | 0.50 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 10 | S10 | 1.50 | < 0.05 | < 0.05 | < 0.05 | 0.22 | 0.16 | 0.24 | < 0.05 | 0.12 | 0.27 | < 0.05 | 0.44 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | 0.45 |
| 11 | S11 | 1.00 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 12 | S12 | 4.00 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 13 | S13 | 2.00 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 14 | S14 | 0.50 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 15 | S15 | 1.50 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 16 | S16 | 3.50 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 17 | S17 | 0.10 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 18 | S18 | 2.50 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 19 | S19 | 0.10 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| 20 | S20 | 0.10 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 | < 0.05 |
| | | | | | | | | | | | | | | | | | | |
| | Screening Criteria Value | | 210.0 | 170.0 | 2400.0 | 7.2 | 2.2 | 2.6 | 320.0 | 77.0 | 15.0 | 0.2 | 280.0 | 170.0 | 27.0 | 2.3 | 95.0 | 620.0 |
| | Source of Screening Criteria Value | | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL |

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## SUMMARY OF LABORATORY SOIL TEST RESULTS

### PETROLEUM HYDROCARBONS

Job No.: 12494
Site: Coed Darcy
Soil Type: Made Ground
Soil Organic Matter: 1%

| No. | Location | Depth (m) | Aliphatic C5-C6 (mg/kg) | Aliphatic C6-C8 (mg/kg) | Aliphatic C8-C10 (mg/kg) | Aliphatic C10-C12 EPH (mg/kg) | Aliphatic C12-C16 EPH (mg/kg) | Aliphatic C16-C35 EPH (mg/kg) | Aliphatic C35-C44 EPH (mg/kg) | Aromatic C5-C7 (mg/kg) | Aromatic C7-C8 (mg/kg) | Aromatic C8-C10 (mg/kg) | Aromatic C10-C12 EPH (mg/kg) | Aromatic C12-C16 EPH (mg/kg) | Aromatic C16-C21 EPH (mg/kg) | Aromatic C21-C35 EPH (mg/kg) | Aromatic C35-C40 EPH (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | S1 | 0,50 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 2 | S2 | 1,50 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 3 | S3 | 3,00 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 4 | S4 | 1,00 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 5 | S5 | 2,00 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 6 | S6 | 0,50 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 7 | S7 | 2,00 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 8 | S8 | 1,00 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 9 | S9 | 0,50 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 10 | S10 | 1,50 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 11 | S11 | 1,00 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 12 | S12 | 4,00 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 13 | S13 | 2,00 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 14 | S14 | 0,50 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 15 | S15 | 1,50 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 16 | S16 | 3,50 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 17 | S17 | 0,10 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 18 | S18 | 2,50 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 19 | S19 | 0,10 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| 20 | S20 | 0,10 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 8,4 | < 0,001 | < 0,001 | < 0,001 | < 1,0 | < 2,0 | < 10 | < 10 | < 8,4 |
| | | | | | | | | | | | | | | | | | |
| | Screening Criteria Value | | 42,0 | 100,0 | 27,0 | 130,0 | 1100,0 | 65000,0 | 65000,0 | 0,1 | 130,0 | 34,0 | 74,0 | 140,0 | 260,0 | 1100,0 | 1100,0 |
| | Source of Screening Criteria Value | | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL | S4UL |

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Intégral Géotechnique

# Appendix C

# Statistical analysis for Beryllium

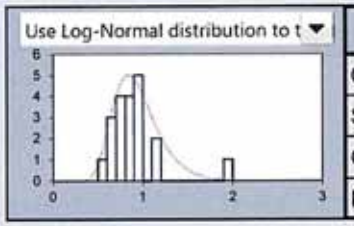
# Test Results

Client/client ref: Jehu Group
Project ref: Coed Darcy

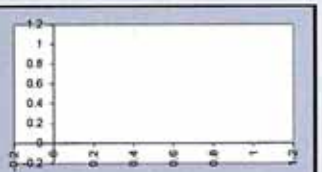
Site ref: 12494
Data description:

Date: 07-Oct-2019
User details: RB

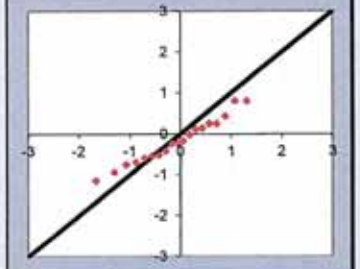
| Dataset: | Beryllium ((mg/kg)) |
|---|---|
| Sample mean, $\overline{x}$ ((mg/kg)) | 0.87 |
| Sample standard deviation, s | 0.2872 |
| Sample size, n | 20 |
| Critical concentration, Cc ((mg/kg)) | 1.7 |



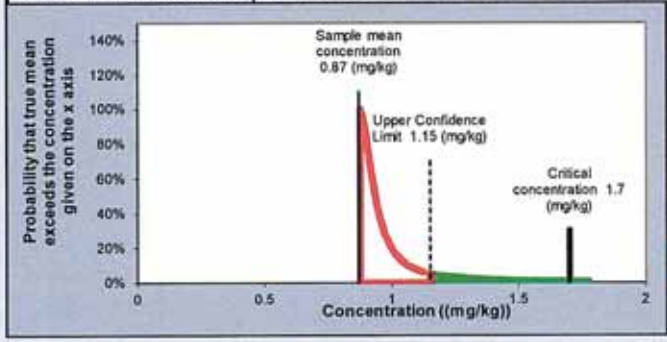

| Outliers & non-detects | |
|---|---|
| Outliers present? | YES |
| Significance level | 5% |
| Outliers removed? | 0 |
| Non-detects | 0 |



| Normality test | |
|---|---|
| Significance level: | 5% |
| Non-normal distribution | |
| Use: | Auto: Chebychev |



| Test scenario: | Planning: is true mean lower than critical concentration (μ < Cc)? |
|---|---|
| Null hypothesis: | The true mean concentration is equal to or greater than the critical concentration: μ ≥ Cc |
| Alternative hypothesis: | The true mean concentration is less than the critical concentration: μ < Cc |




| Evidence against Null hypothesis: | 99% |
|---|---|
| Base decision on: | evidence level |
| Evidence level required: | 95% |
| Balance of probability? | N/A |
| Reject Null Hypothesis? | Yes |

**μ < Cc (re this dataset)**

Back to data | Back to summary | Go to outlier test | Go to normality test

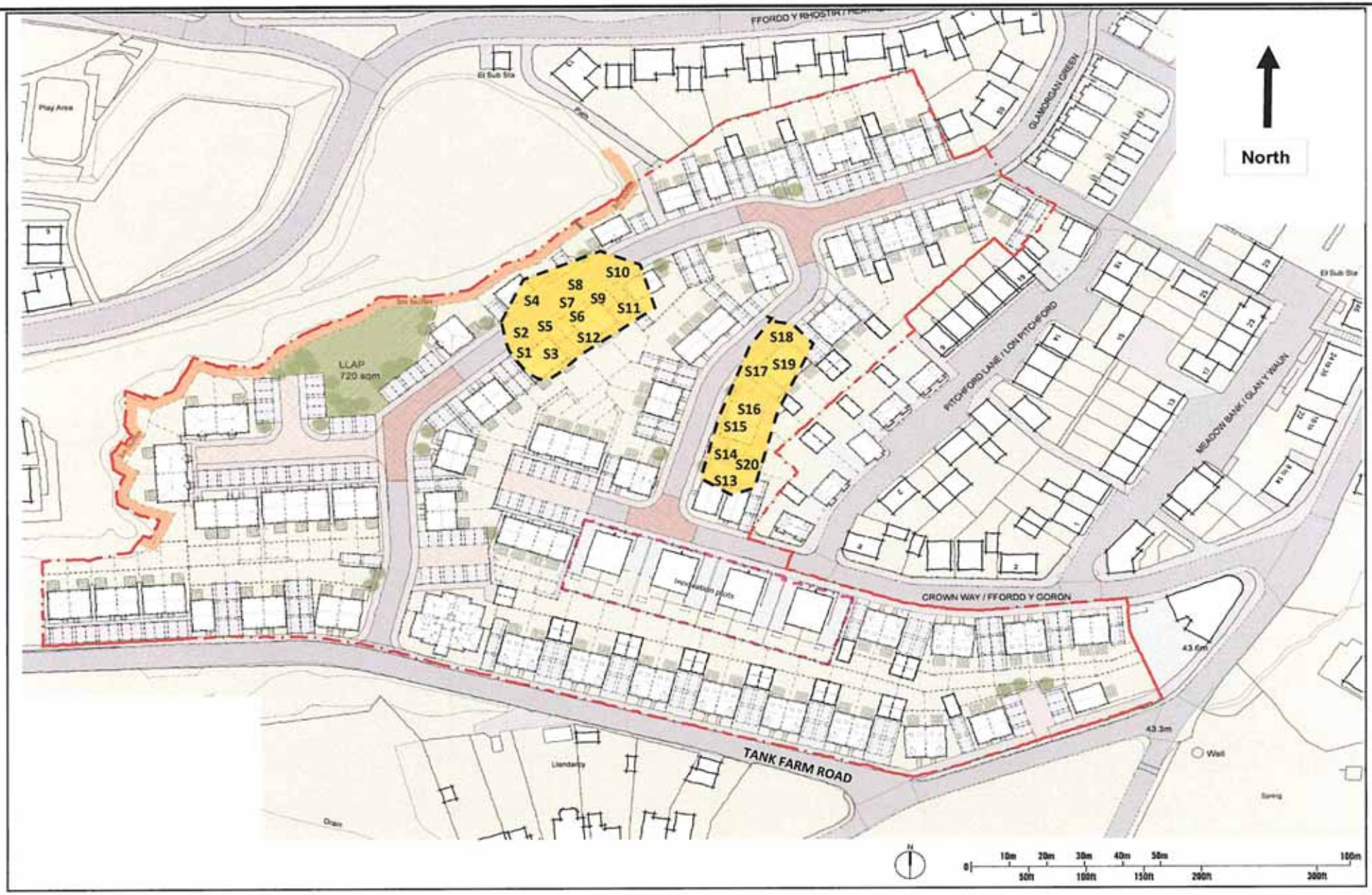



**Figure 1 - SITE LAYOUT Stockpile Sampling** Oct-19

**Phase 2, Coed Darcy**

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# APPENDIX E

## IG PHASE 3 COAL MINING RISK ASSESSMENT REPORT

**Intégral Géotechnique**

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Tel: 029 2080 7991
mail@integralgeotec.com

12494/PD/PB

30 September 2019

Waterstone Homes
Number One
Waterton Park
Bridgend CF31 3PH

**For the attention of Mr Jon Dobbs**

Dear Sirs,

**Coed D'Arcy – Additional Drilling Investigation and Phase 3 Coal Mining Risk Assessment**

Further to your instruction, we confirm that we have recently carried out an additional rotary drilling investigation at the above site, in order to establish the extent of any shallow mine workings beneath the site. We can now report as follows:

***Background***

The 1:50,000 British geological map show that the conjectured outcrop of the both Bodwr and Hughes coal seams are just south of the site and Tank Farm Road. Hence as the strata are believed to dip at approximately 10° to the north, both coal seams and any associated shallow mine workings could underlie the site at shallow depths.

Previously Earth Science Partnership (ESP) carried out a coal mining risk assessment for the site, which included drilling six rotary boreholes across the site to investigate the potential of shallow mine workings being present beneath the site. The borehole findings were given in their Phase 2 Coal Mining Assessment Report reference ESP.7103h.3169, dated April 2019, which should be read in conjunction with this report.

The ESP report identified workable coal seams in three of the boreholes. In addition, some broken ground was encountered in two of the drilled boreholes and was interpreted as probable backfilled working. The report recommended further rotary drilling works to more accurately define the ground subsidence risk zone beneath the site.

***Drilling Works***

The rotary drilling works were carried out by Apex Drilling Services Limited in September 2019. The hydraulically operated drilling rigs used compressed air and water as the flushing medium.

The borehole locations are shown on the attached plan and the borehole logs, which are based on the driller's logs, are presented in Appendix A.

In order to confirm the approximate extent of the area that is underlain at shallow depths by the Bodwr and Hughes coal seam and any associated mine workings, thirty boreholes were drilled across the site using a Beretta T44 rotary drilling rig.

The boreholes were drilled down to a maximum depth of 31.5m, in order to prove the extent and depths of any underlying shallow coal seams and/or associated mineworkings.

The rockhead was encountered at depths ranging from the site surface down to 2.6mbgl, while the coal seams or associated workings were found to increase in depth northwards.

***Mining***

Southern Area

Workable coal seams with occasional associated mine workings were only encountered at shallow depths beneath the south-central part of the site. These coal seams are thought to be the Bodwr and the underlying Hughes seams, which had a vertical separation of approximately 13m to 14m.

From the drilling results, only two of the thirty boreholes encountered any mine workings beneath the site. These boreholes were IG1 and IG17 both of which located beneath the southern half of the site. IG1 encountered 1.6m of broken ground at 16.7mbgl, while IG17 encountered 1.1m of broken ground at 26.1mbgl, in both cases at the horizon of the Bodwr seam.

In boreholes IG2, IG7 and IG8, together with the previous boreholes DH101 and DH102, the Bodwr seam was found to range in thickness between 1.0m and 1.3m. In addition, as discussed above, 1.6m of broken ground which was thought to be backfilled or collapsed workings, was encountered at the horizon of the Bodwr seam in borehole IG1.

To the east and west of this south-central area, the seam thickness was found to typically reduce to between 0.5m and 1.0m.

In addition to the Bodwr seam, IG7, IG8 and IG9 encountered an underlying banded coal seam, thought to be the Hughes seam, at depths ranging from 26.3mbgl to 29.6mbgl, with a seam thickness ranging from 0.7m to 1.8m.

The general convention for coal mining subsidence risk, is that the rock cover thickness should be ten times the height of the coal working, in order to prevent associated roof collapse migrating up to the surface.

Therefore, based on the seam thickness proved in the boreholes, some 13 to 16m of rock cover would be required above the Bodwr seam in the central area, reducing (with the seam thickness) to 10m to the east and west.

In the case of the deeper Hughes seam, some 18m of rock cover would be required, based on its seam thickness proved in IG8.

Based on these rock cover requirements, there is insufficient cover above the Bodwr seam in the south-central area and therefore there is thought to be a high potential risk of mining-related surface subsidence occurring in the zone highlighted red on Figure 1.

As already discussed, the boreholes proved that the Bodwr seam thins to the east and west of the south-central area. The boreholes did not encounter any evidence of associated workings in these areas. In addition, given the thinner nature of the seam in these parts, there is sufficient overlying rock cover to prevent any mining subsidence reaching the surface, should any unrecorded workings be present in these areas.

The boreholes also established that the underlying Hughes seam is generally deeper than 30m beneath most of the site. Only a few of the boreholes near the southern boundary encountered this seam some 13m to 14m below the Bodwr seam. In these boreholes the Hughes seam was deeper than 25m, with well over 18m of rock cover. It is therefore considered that, if there are any associated workings in the Hughes seam, they would be too deep to present a mining subsidence risk to the site.

North and Central Areas

The fifteen boreholes IG15 to IG30 drilled in northern and central parts of the site typically did not encounter any coal down to 30m depth. Only IG26 and IG28 encountered an intact coal seam of any note, but this was only 0.7m thick and had sufficient overlying rock cover. Previously, the ESP report discussed a potential mining risk in this area and possible faulting, due to their boreholes DH104 and DH106 encountering broken ground at 18.5mgbl and 13.5mbgl respectively. However, none of the nearby Intégral Géotechnique boreholes found any evidence of mine workings or any workable coal seams. It is therefore believed that these ESP boreholes encountered some localised, possibly fault-related, natural fractures within the rock strata, which ESP misconstrued as probable workings. Hence, in light of the findings from the numerous additional boreholes that have been drilled, there is not considered to be a shallow mining risk in this area of the site.

***Mining Recommendations***

The southern central part of the site shaded red on Figure 1, has been identified as having a high potential risk of mining subsidence associated with potential old shallow workings in the Bodwr seam. However, the extent of this potential high-risk mining subsidence zone, is significantly less than the subsidence risk zones initially postulated by ESP in their report.

Although no voids and only limited evidence of old collapsed or backfilled workings have been found to date, it is recommended that a plot by plot proof drilling exercise is carried out across this high potential risk zone as a precaution.

Subject to the thickness of rock cover proved above the Bodwr coal seam/workings, follow-on drilling and grouting ground stabilisation works may subsequently be considered necessary, if the proof drilling boreholes should encounter uncollapsed or partially collapsed shallow workings in the Bodwr seam, with insufficient overlying rock cover to prevent potential surface subsidence.

The extent of the potential high-risk mining subsidence zone has been based on a requirement of 16m of rock cover above the seam/associated workings, based on the 1.6m of broken ground which was encountered at the Bodwr horizon in the IG1 borehole. However, based on the maximum 1.3m seam thickness proved in the nearby boreholes, the 1.6m of broken ground may include some roof collapse.

This rock cover thickness guideline should be reviewed in light of additional findings from the recommended proof drilling works.

If the recommended proof drilling boreholes should consistently prove that the seam/associated workings are consistently thicker or thinner than 1.6m, then the required rock cover thickness may need to be adjusted accordingly.

The proof drilling works should be carried across this potential high-risk mining subsidence zone prior to any development of this part of the site. If the proof drilling should encounter uncollapsed or partially collapsed shallow workings in the Bodwr seam with insufficient overlying rock cover, then follow-up drilling and grouting stabilisation works may become necessary.

The underlying Hughes seam has been proved to be generally deeper than 30m depth and to have more than 20m of overlying competent rock cover, so it is not considered to represent a mining risk to the site development.

***Mine Gas Risk***

The ESP report postulated a potential risk of mine gases migrating up to the site's surface from possible underlying old workings, as a result of a possible fault crossing the site.

Apart from some broken ground being encountered in two of ESP's boreholes, none of the recent additional boreholes have encountered any evidence for a fault crossing the site. Neither is there any visible evidence in the nearby rock face that runs along the western boundary of the site. Nevertheless, a number of standpipes have been installed as a precaution, in order to carry out a gas monitoring programme.

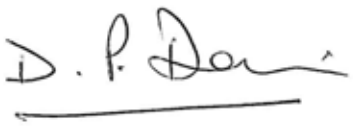
Based on the preliminary round of readings, insignificant levels of methane and carbon dioxide have been measured so far and no gas flows have been detected.

An addendum report with a full set of gas readings and our concluding assessments and recommendations will be issued in due course, on completion of the whole gas monitoring programme.

It should be noted that the URS Validation Report ref. 44382729/BRRP0004 Issue No 1 of 18 January 2010 advises that a vapour (VOC and TPH) resistant membrane to provide a low permeability barrier against ingress of gas into the building fabric and a passive venting layer to all buildings.

We trust that the above is to your satisfaction. However, if you have any queries or require any further information, please do not hesitate to contact us.

Yours faithfully,



**D P Davies**
**For**
**Intégral Géotechnique (Wales) Limited**

Enc

# Appendix A

# Rotary Borehole Logs

| Intégral Géotechnique | Intégral House, 7 Beddau Way<br>Castlegate Business Park<br>Caerphilly CF83 2AX<br>Tel. 029 20807991<br>Fax. 029 20862176<br>mail@integralgeotec.com | Project Name:<br>**Coed Darcy** | Project No.:<br>**12494** | Borehole No.:<br>**IG1**<br>Sheet 1 of 1 |
|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>06/09/2019 - | Logged By:<br>PD |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |
| | | 0.00 - 30.00 | | | | | 0.30 | | | | Clay<br>Sandstone |
| | | | | | | | 16.70 | | | | Backfilled workings very wet (1.6m) retained flush |
| | | | | | | | 18.30 | | | | Sandstone and Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole wet at 16.7m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 06/07/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

AGS

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Caerphilly CF83 2AX
Tel. 029 20807991
Fax. 029 20862176
mail@integralgeotec.com

| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG2** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 09/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.90 | | | | Boulder Clay |
| | | 0.00 - 30.00 | | | | | | | | | Sandstone and Mudstone bands |
| | | | | | | | 23.40 | | | | Coal (1.1m) |
| | | | | | | | 24.50 | | | | Sandstone and Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 09/09/2019. Gas monitoring standpipe installed at 3.0m

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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mail@integralgeotec.com

| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG3** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 09/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 0.90 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone and Mudstone bands |
| | | | | | | | 21.70 | | | | Coal (0.6m) |
| | | | | | | | 22.00 | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**
Borehole wet at 10.0m. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 09/09/2019

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG4** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 17/09/2019 - / Logged By: |

| Well | Water Strikes | Rotary Coring: Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|

**Remarks:**

Dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 17/09/2019. Starter pit excavated to 0.6m

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG5** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 18/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.30 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone |
| | | 0.00 - 30.50 | | | | | 14.70 | | | | Coal (0.6m) |
| | | | | | | | 15.30 | | | | Mudstone |
| | | | | | | | 17.80 | | | | Coal (0.4m) |
| | | | | | | | 18.20 | | | | Mudstone |
| | | | | | | | 26.60 | | | | Broken Ground (2.9m) |
| | | | | | | | 29.50 | | | | Mudstone |
| | | | | | | | 30.50 | | | | End of Borehole at 30.50 m |

**Remarks:**

Borehole wet at 177m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 16/09/2019. Starter pit excavated to 0.3m

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG6** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 17/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring: Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.70 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone and Mudstone bands |
| | | | | | | | 9.20 | | | | Coal (0.1m) |
| | | | | | | | 9.30 | | | | Mudstone and Sandstone bands |
| | | | | | | | 11.20 | | | | Coal (0.4m) |
| | | | | | | | 11.60 | | | | Mudstone and Sandstone bands |
| | | 0.00 - 30.00 | | | | | 14.70 | | | | Coal (0.2m) |
| | | | | | | | 14.90 | | | | Mudstone |
| | | | | | | | 15.20 | | | | Coal (0.3m) |
| | | | | | | | 15.50 | | | | Mudstone and Sandstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 17/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

AGS

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>05/09/2019 - | Logged By: |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |

**Remarks:**

Borehole wet at 12.0m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 05/06/07/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG8** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 06/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring: Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 1.00 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone and Mudstone bands |
| | | | | | | | 11.80 | | | | Coal (1.1m) |
| | | | | | | | 12.90 | | | | Sandstone and Mudstone bands |
| | | 0.00 - 31.00 | | | | | | | | | |
| | | | | | | | 26.30 | | | | Banded Coal (1.8m) |
| | | | | | | | 29.00 | | | | Mudstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole wet at 9.0m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 06/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG9** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 16/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring: Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Boulder Clay |
| | | | | | | | 2.60 | | | | Weathered Sandstone |
| | | | | | | | 5.80 | | | | Broken Ground and Coal (0.5m) |
| | | | | | | | 6.30 | | | | Mudstone and Sandstone bands |
| | | 0.00 - 31.00 | | | | | 15.10 | | | | Coal (0.4m) |
| | | | | | | | 15.50 | | | | Mudstone and Sandstone bands |
| | | | | | | | 29.60 | | | | Coal (0.7m) |
| | | | | | | | 30.20 | | | | Mudstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole wet at 16.7m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 16/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG10** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 16/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.50 | | | | | 2.40 | | | | Boulder Clay |
| | | | | | | | 7.30 | | | | Sandstone |
| | | | | | | | 7.40 | | | | Coal (0.1m) |
| | | | | | | | 16.60 | | | | Mudstone and Sandstone bands |
| | | | | | | | 17.10 | | | | Coal (0.5m) |
| | | | | | | | 30.50 | | | | Mudstone and Sandstone bands with occasional coal traces |
| | | | | | | | | | | | End of Borehole at 30.50 m |

**Remarks:**

Borehole wet at 7.0m. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 16/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG11** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 09/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | | | | | Sandstone |
| | | | | | | | 22.10 | | | | Coal (0.6m) |
| | | | | | | | 23.00 | | | | Sandstone |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**
Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 09/09/2019

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG12** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 09/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 31.00 | | | | | | | | | Sandstone |
| | | | | | | | 28.20 | | | | Coal (0.6m) |
| | | | | | | | 28.80 | | | | Sandstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 09/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG13** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 09/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | | | | | Sandstone |
| | | | | | | | 27.50 | | | | Coal (0.6m) |
| | | | | | | | 28.10 | | | | Sandstone |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 09/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>10/09/2019 - | Logged By:<br>PD |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |
| | | 0.00 - 31.00 | | | | | | | | | Sandstone |
| | | | | | | | 28.30 | | | | Coal (0.7m) |
| | | | | | | | 29.00 | | | | Sandstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 10/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG15** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 10/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring: Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 30.00 | | | | Sandstone |
| | | | | | | | | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 10/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>11/09/2019 - | Logged By: |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 11/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG17** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 16/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 31.00 | | | | | 0.90 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone |
| | | | | | | | 23.00 | | | | Coal (1.2m) |
| | | | | | | | 24.20 | | | | Mudstone and Sandstone bands |
| | | | | | | | 26.10 | | | | Broken Ground |
| | | | | | | | 27.20 | | | | Mudstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**

Borehole wet at 14.5m. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 16/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG18** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 16/09/2019 - | Logged By: pD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 30.00 | | | | Sandstone<br>End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 16/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
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|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG19** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 11/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 16.00 | | | | Sandstone |
| | | | | | | | 30.00 | | | | Sandstone and Mudstone bands |
| | | | | | | | | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole wet at 25m. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 11/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>12/09/2019 - | Logged By:<br>PD |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |
| | | 0.00 - 30.00 | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 12/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG22** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 12/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 30.00 | | | | Sandstone<br>End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 12/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG23** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 12/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 31.00 | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 28.90 | | | | Soft Broken Ground (retained flush 0.8m) |
| | | | | | | | 29.70 | | | | Sandstone |
| | | | | | | | 31.00 | | | | End of Borehole at 31.00 m |

**Remarks:**
Borehole dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 12/09/2019.

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | | Project No.: **12494** | Borehole No.: **IG24** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 13/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 1.90 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole wet at 12.0m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 13/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

AGS

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG25** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 12/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 2.50 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 12/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG26** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 18/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 0.70 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone with some coal traces |
| | | | | | | | 3.20 | | | | Sandstone |
| | | | | | | | 6.70 | | | | Coal (0.2m) |
| | | | | | | | 6.90 | | | | Sandstone |
| | | | | | | | 9.10 | | | | Coal (0.7m) |
| | | | | | | | 9.80 | | | | Sandstone and Mudstone bands |
| | | | | | | | 13.50 | | | | Coal (0.6m) |
| | | | | | | | 14.10 | | | | Sandstone and Mudstone bands with some coal traces |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry Air/water used as flushing medium. Description based on drillers logs. Date drilled 18/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG27** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: / Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: / Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 13/09/2019 - / Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 1.70 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole wet at 23.0m. Air/water used as flushing medium. Description based on drillers logs. Date drilled 13/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates 18/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | 0.50 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone with some coal traces |
| | | | | | | | 8.90 | | | | Coal (0.2m) |
| | | | | | | | 9.10 | | | | Mudstone |
| | | | | | | | 9.70 | | | | Coal |
| | | | | | | | 9.90 | | | | Sandstone |
| | | | | | | | 11.20 | | | | Coal (0.7m) |
| | | | | | | | 11.90 | | | | Sandstone and Mudstone bands |
| | | 0.00 - 30.50 | | | | | 15.40 | | | | Coal (0.6m) |
| | | | | | | | 16.00 | | | | Sandstone and Mudstone bands |
| | | | | | | | 30.50 | | | | End of Borehole at 30.50 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 18/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| Project Name: | Project No.: | Borehole No.: |
|---|---|---|
| **Coed Darcy** | **12494** | **IG29** Sheet 1 of 1 |
| Location: / Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig / Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: / Depth of Casing: | Dates 13/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 1.20 | | | | Boulder Clay |
| | | | | | | | | | | | Sandstone with Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as flushing medium. Description based on drillers logs. Date drilled 13/09/2019.

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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|---|---|---|---|---|
| Location: | | Client: Quad Consult | Coordinates: | Hole Type:<br>RO |
| Equipment: Rotary Drilling Rig | | Diameter of Casing: | Level: | Scale<br>1:200 |
| Diameter of Boring: | | Depth of Casing: | Dates<br>11/09/2019 - | Logged By:<br>PD |

| Well | Water Strikes | Rotary Coring | | | | | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Depth (m) | TCR | SCR | RQD | FI | | | | | |
| | | 0.00 - 30.00 | | | | | | | | | Sandstone and Mudstone bands |
| | | | | | | | 30.00 | | | | End of Borehole at 30.00 m |

**Remarks:**

Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 11/09/2019

**Key:**

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
RQD - Rock Quality Designation

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| | | | |
|---|---|---|---|
| Project Name: **Coed Darcy** | Project No.: **12494** | Borehole No.: **IG30** Sheet 1 of 1 |
| Location: | Client: Quad Consult | Coordinates: | Hole Type: RO |
| Equipment: Rotary Drilling Rig | Diameter of Casing: | Level: | Scale 1:200 |
| Diameter of Boring: | Depth of Casing: | Dates 11/09/2019 - | Logged By: PD |

| Well | Water Strikes | Rotary Coring Depth (m) | TCR | SCR | RQD | FI | Depth (m) | Level (m AOD) | N Value | Legend | Stratum Description |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 0.00 - 30.00 | | | | | 30.00 | | | | Sandstone and Mudstone bands<br>End of Borehole at 30.00 m |

**Remarks:**
Borehole dry. Air/water used as a flushing medium. Description based on drillers logs. Date drilled 11/09/2019

**Key:**
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
SPT - Standard Penetration Test (split spoon)
CPT - Standard Penetration Test (solid cone)
W - Water sample
U - Undisturbed sample
TCR - Total Core Recovery
SCR - Solid Core Recovery
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**Figure**

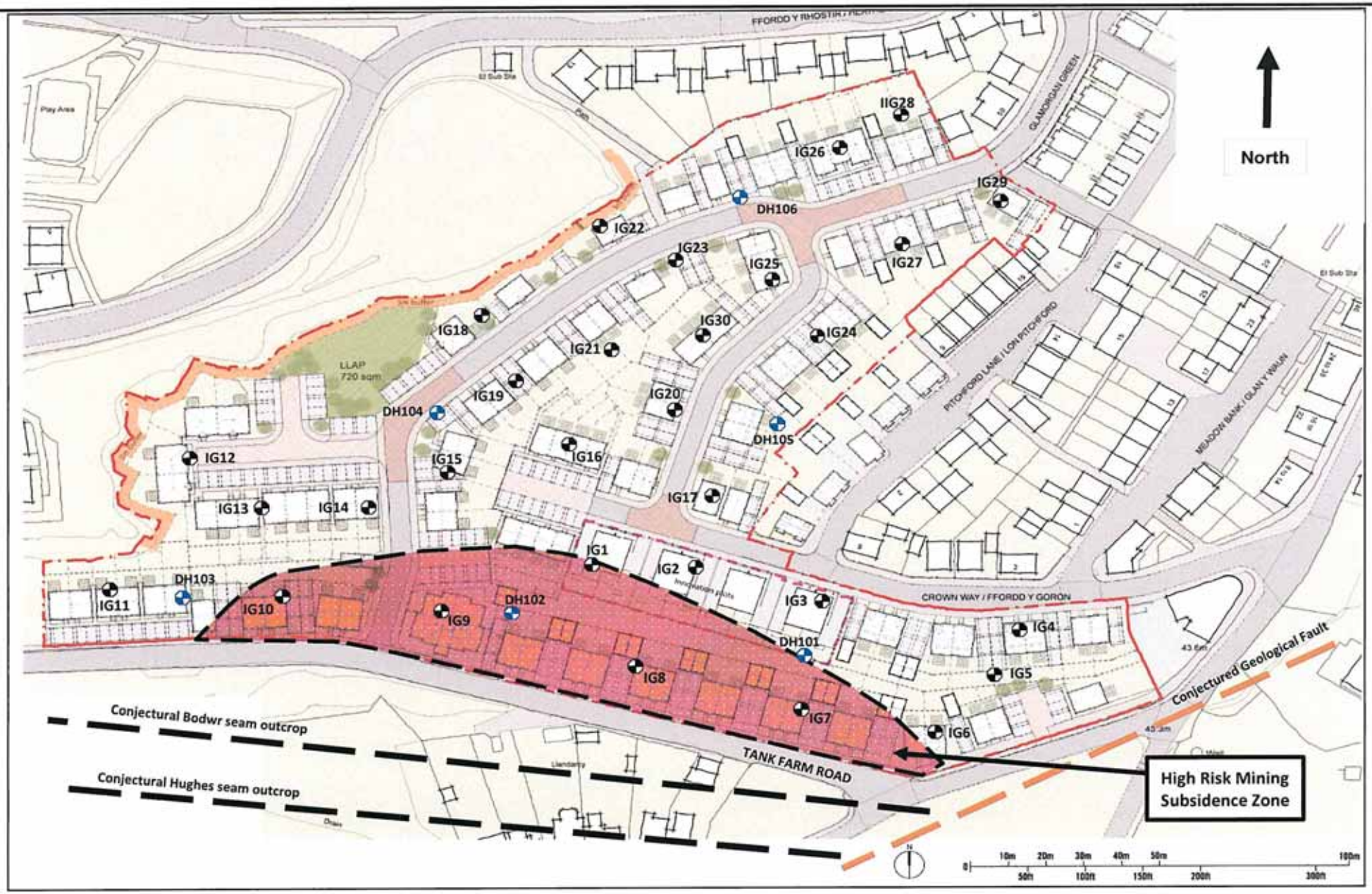



**Figure 1 - SITE LAYOUT**

**Phase 2, Coed Darcy**

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