Preliminary
Phase 2 Environmental Assessment
University of Western Sydney
South Werrington Sub-Precinct
University of Western Sydney

February 2009

WSP

QM

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Glossary of Abbreviations

A list of the common abbreviations used throughout this report is provided below.

As	Arsenic
Cd	Cadmium
Cr	Chromium
Cu	Copper
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
B(a)P	Benzo (a) pyrene
DECC	NSW Department of Environment and Climate Change
DoP	NSW Department of Planning
DQO	Data Quality Objectives
DP	Deposited Plan
EPA	New South Wales Environment Protection Authority
Hg	Mercury
HIL	Health Based Investigation Level
LOR	Limit of Reporting
m bgl	Metres below ground level
Ni	Nickel
OCP	Organochlorine Pesticides
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
Pb	Lead
PIL	Phytotoxicity-based Investigation Level
PCB	Polychlorinated Biphenyls
PQL	Practical Quantitation Limit
QA/QC	Quality Assurance/Quality Control
RPD	Relative Percentage Difference
TPH	Total Petroleum Hydrocarbons (C_6-C_9 and C_{10}-C_{36})
VOCs	Volatile Organic Compounds
Zn	Zinc

Executive Summary

WSP Environmental Pty Ltd (WSP) was commissioned by Fitzwalter Group Pty Ltd (Fitzwalter), on behalf of the University of Western Sydney (UWS) to conduct a Preliminary Phase 2 Environmental Assessment (Phase 2) at the property identified as Lot 1 DP 791299 (the Site). The Site is located at the Werrington North Campus, off the Great Western Highway, Werrington and occupies an area of approximately 28 hectares.

The Site is currently vacant and is proposed for re-development under several zoning areas including general residential, medium density residential, light industrial, environmental conservation and public recreation.

The objective of the Preliminary Phase 2 Environmental Assessment was to supplement the previous Phase 1 investigation conducted by Douglas Partners Pty Ltd (DP 2007a) and assess those areas where site activities may have resulted in impact to underlying soils. This Preliminary Phase 2 Environmental Assessment was conducted to determine the suitability of the site for re-development and WSP has considered the most sensitive proposed land use - residential with gardens and accessible soil.

The scope of works conducted by WSP included 40 test pits, 3 boreholes and installation of 3 groundwater monitoring wells as outlined in the SAQP agreed with the appointed site Auditor, Mr Mike Hayter of Environ.

The site is comprised of an irregular shaped parcel of land which is grassed (up to 1 m in height) with scattered bushland areas and is currently vacant with the exception of some small sheds in the centre of the site.

The site slopes from a ridgeline at the western side of the site towards a small drainage depression on the eastern side of the site which is surrounded to the north and east by a retaining wall.

The review of historical sources and previous investigation (DP 2007a), have been found by WSP to be in general agreement with the findings of the WSP Preliminary Phase 2 Environmental Assessment with the exception of the following:

- WSP did not identify evidence of former building footprints or building rubble at AEC 4 at the surface or at depth in test pits.
- The abandoned waste stockpiles identified as AEC 5 were observed by WSP to be located on the adjacent lot, outside the property boundary of the current investigation.
- Generally test pits did not encounter buried waste materials (e.g. metal, ash, glass or other anthropogenic material) with the exception of TP39 with a plastic fragment at a depth of 0.8 mbgl.
- The areas of filling identified as AEC 8 were observed by WSP to comprise works associated with flood control, with a retention wall formed from site sourced materials.

During the site inspection, the natural vegetation appeared to be in healthy condition, with no obvious signs of disturbance or stress. No staining, malodours or discolouration of soils was observed.

The surface soils encountered during the fieldworks generally comprised the following:

- Surface soils (0.0 – 0.5 m bgl which were interpreted to comprise reworked or *in-situ* natural topsoils typically described as dark brown, clayey silt with organics.
- Filling generally comprised reworked natural material consisting of silty clays, dark brown in colour with organic matter present. This material appears to be locally sourced and is found only where an earth mound has been formed to act as a retaining wall on the eastern portion of the site (AEC 8).
- Natural material (0.3m – 8.0 m bgl), generally comprised orange, brown and grey clay with red/orange mottling in various stages of weathering as indicated by calcium carbonate nodules, ironstone fragments, sandstone fragments and changes in colour with depth. Charcoal fragments and were also present in the natural material, likely from natural deposition. Lenses of sand and rounded gravels in the southern portion of the site indicate fluvial deposition. Variations in natural material across the site reflect the characteristics identified by DP (July 2007b) in the two geomorphic units

- No fibre cement fragments were observed on the surface or in soils at the site during WSP site works, however a fibre cement pipe was encountered at TP04. Soils were moist to damp, with no evidence of groundwater flow observed in the soil profile.
- Concentrations of BTEX, OCP, OPP, PAH, PCB, Phenols, TPH and asbestos in soils were either below the laboratory detection limits or below the health-based investigation levels for Residential with access to soils (NEPM HIL-A).
- Concentrations of heavy metals were below the health-based investigation levels for Residential with access to soils (NEPM HIL-A) and provisional phytotoxicity based investigation levels (PILs).
- Concentrations of BTEX, PAH, Phenols, TPH, VHCs in groundwater were below the laboratory detection limits.

On the basis of the Phase 1 Investigation, site history, current site condition and results of the Preliminary Phase 2 Environmental Assessment, the site is considered to be suitable for residential land use with gardens and accessible soils.

In order to facilitate proposed future development, WSP recommends that UWS delineate the extent of the asbestos containing pipe identified near TP04 and remove the pipe in accordance with current best practice.

WSP Environmental Pty Limited

1 Introduction

1.1 BACKGROUND

This report details the findings of the Preliminary Phase 2 Environmental Assessment undertaken by WSP Environmental Pty Ltd (WSP) for Fitzwalter Group Pty Ltd (Fitzwalter) on behalf of University of Western Sydney (UWS) at the property identified as Lot 1 DP 791299. The site is located at the Werrington North Campus, off the Great Western Highway, Werrington and occupies an area of approximately 28 Ha.

A Phase 1 Investigation conducted by Douglas Partners Pty Ltd (DP 2007a) identified a number of Areas of Environmental Concern (AECs) as discussed further in section 3.4. The objective of the Phase 2 was to supplement the previous investigation and assess any impacts to soil caused by historical site activities, specifically those AECs identified by DP (2007a). Works were conducted in general accordance with relevant Department of Environment and Climate Change (DECC) guidelines.

The Site is currently vacant and is proposed for re-development under several zoning areas including general residential, medium density residential, light industrial, environmental conservation and public recreationThis Preliminary Phase 2 Environmental Assessment was conducted to determine the suitability of the site for re-development and WSP has considered the most sensitive proposed land use - residential with gardens and accessible soil.

1.2 SCOPE OF WORK

The scope of work comprised the following:

- Preparation of a SAQP detailing Data Quality Objectives (DQO) and scope for fieldwork as endorsed by the appointed Auditor, Mr Mike Hayter of Environ;
- Excavation of three, two and five test pits targeted to AEC 4, 5 and 8 respectively;
- Excavation of an additional thirty test pits across the remainder of the UWS property (28 Ha) to provide general site coverage;
- Drilling of three boreholes to a maximum depth of 8 metres below ground level or to v-bit refusal into the underlying natural shale material and installation of groundwater monitoring wells at these locations.
- Laboratory analysis including:
    - one soil sample from each of the forty test pits and three boreholes from the fill horizon/surface soil for heavy metals (arsenic, cadmium, chromium, copper, lead, nickel, mercury and zinc), total petroleum hydrocarbons C6 to C36 (TPH), benzene / toluene / ethyl benzene / xylene (BTEX), polycyclic aromatic hydrocarbons, total phenols, organochlorine pesticides (OCP), organophosphate (OPP), polychlorinated biphenyls (PCB) and asbestos.
    - A further ten representative soil samples (equating to 25%) taken from the remaining depth samples for analysis of the same suite outline above.
    - Three (3) groundwater samples analysed for heavy metals, TPH, BTEX, PAH, total phenols and chlorinated solvents.
- Assessment of results against the NEPM (1999) HIL A – residential land use criteria as well as phytotoxicity guidelines (EIL) and NSW EPA (1994) Service Station Guidelines criteria for soil;
- Assessment of groundwater results against the ANZECC (2000) and NSW EPA (1994) guidelines; and
- Preparation of a Phase 2 report in accordance with NSW EPA (1997) Guidelines for Consultants Reporting on Contaminated Sites.

1.3 LIMITATIONS OF THIS REPORT

The findings of this report are based on the Scope of Work outlined above. WSP performed the services in a manner consistent with the normal level of care and expertise exercised by members of the environmental assessment profession. No warranties express or implied, are made.

Subject to the Scope of Work, WSP's assessment is limited strictly to identifying typical environmental conditions associated with the subject property area and does not include evaluation of any other issues.

The absence of any identified hazardous or toxic materials on the subject property should not be interpreted as a guarantee that such materials do not exist on the site. As this is a preliminary site investigation only, it is not intended to be comprehensive. Additionally, WSP did not conduct gas or wastewater analyses. Soil sampling conducted was of a targeted nature. WSP did not investigate any waste materials from the property that may have been disposed of off the site, nor related waste management practices.

The results of this assessment are based upon the site inspection, soil sampling program and groundwater sampling program conducted on 15 and 16 December 2008 and 21, 23 and 30 January 2009 by WSP personnel and information provided by the site owner and regulatory agencies during the time of the investigation.

All conclusions and recommendations regarding the property area are the professional opinions of the WSP personnel involved with the project, subject to the qualifications made above. While normal assessments of data reliability have been made, WSP assumes no responsibility or liability for errors in any data obtained from regulatory agencies, statements from sources outside of WSP, or developments resulting from situations outside the scope of this project.

WSP is not engaged in environmental assessment and reporting for the purpose of advertising sales promoting, or endorsement of any client interests, including raising investment capital, recommending investment decisions, or other publicity purposes. The client acknowledges that this report is for the exclusive use of the client, its representatives and advisers and any investors, lenders, underwriters and financiers who agreed to execute the reliance letter, and the client agrees that WSP's report or correspondence will not be, except as set forth herein, used or reproduced in full or in part for such promotional purposes, and may not be used or relied upon in any prospectus or offering circular.

2 Site Condition and Surrounding Environment

2.1 SITE IDENTIFICATION

The site is located north of the Great Western Highway between Water St and O'Connell St, Werrington, NSW as shown in **Figure 1**. The site details are summarised in Table 2-1 and described in more detail in the following sections.

Table 2-1 Summary Site Details

Lot/DP	Lot 1 DP 791299
Address	UWS Werrington North Campus, Great Western Highway, Werrington, NSW, 2747
Local Government Authority	Penrith
Current Zoning	General residential, medium density residential, light industrial, environmental conservation and public recreation – See **Figure 2**)
Current Use	Vacant – rural
Proposed Use	Mixed use urban precinct – residential, light industrial and open space.
Site Area	Approximately 28Ha

2.2 CURRENT SITE CONDITION & LAND USE

The site is an irregular shaped parcel of land, occupying an area of approximately 28 Ha (**Figure 3)**. Access to the site can be gained via the University of Western Sydney, Werrington North campus (off Great Western Highway) or a locked gate at the end of Chapman Street.

The majority of the site is grassed with scattered bushland areas and is currently vacant. The grassed areas were up to 1 m in height at the time of site works, with a 3 m wide path around the site perimeter mown for access. The eastern portion of the site was obscured by tall grasses approximately 1 m in e. Observations at the time of site works indicated that this area was between 1 m and 1.5 m lower in elevation than surrounding areas with saturated areas indicating regular flooding and retention of water. A mound of earth (approximately 2 m wide) was present on the northern and eastern sides of this area forming a retaining wall to restrict flooding of adjacent residential properties and Sydney Water depot. A number of manhole covers were identified by a service locater, indicating the presence of sewer lines beneath the site. A redundant fibre cement pipe was encountered at a depth of 0.3 m below ground level (bgl) on the western side of the site (**Figure 3** – GPS co-ordinates 56H 291579 UTM 6262149). No other underground services or underground storage tanks (USTs) were identified in the site history or from the site inspection.

Small structures in the south-western area of the site included a shelter shed, toilet, shed and a workbench and 3 empty drums (unlabelled). These areas were targeted with test pits at TP19, TP15 and TP20.

The site is intermittently fenced along boundaries with different properties including fencing up to 2 m in height and with large sections of damaged or missing fencing.

The site is easily accessed by members of the public and illegal dumping of waste materials may have occurred in the past, however, the site is monitored by a 24-hour security patrol by UWS campus security.

During the site inspection, the natural vegetation appeared to be in healthy condition, with no obvious signs of disturbance or stress. During the field works the ground on the eastern portion of the site was saturated as this area forms a natural drainage system.

2.3 GEOLOGY

The following is sourced from DP 2007b report:

Reference to the Geology of the Penrith 1:100,000 Sheet indicates that the site is underlain by the Bringelly Shale, the uppermost formation of the Wiannamatta Group of Triassic age. The Bringelly Shale typically comprises interbedded claystone, siltstone and laminate with minor fine to medium grained sandstone lenses or bands and rare coaly bands.

2.4 SOILS

The following is sourced from DP 2007b report:

Reference to the Soil Landscapes of the Penrith 1:100,000 Sheet indicates that the area is characterised by the following soils:

- **Luddenham Soil Landscape -** This is an erosional unit with shallow (<1.0m) brown podzolic soils and massive earthy clays on crests and ridges, moderately deep (0.7-1.5m) red podzolic soils on upper slopes and moderately deep (<1.5m) yellow podzolic soils and prairie soils on lower slopes and drainage lines. The soils of this landscape are assessed as having moderate surface movement potential and as presenting a moderate to very high erosion hazard.
- **South Creek Soil Landscape** – A fluvial landscape which includes very deep layered sediments. Where pedogenesis has occurred soils include sandy to sandy clay loams, clay loams and brown clays. Soils are typically of low fertility, have low surface movement potential, may be subject to waterlogging and may present a high to extreme erosion hazard.

DP identified two geomorphic units, namely, Unit 1 occupying the western portion of the lot and Unit 2 occupying the eastern portion of the lot. From subsurface investigations, DP (July 2007b) characterised these units as follows:

- **Unit 1** characterised by Luddenham Soil Landscape, comprising mid and footslopes of a northward trending ridgeline (colluvial and residual soils) characterised by residual soils at least 3m thick composed of clay, silty clay and clayey silt with some ironstone nodules, typically hard consistency with shale encountered at depths of 2.0 to 2.5 m bgl. Colluvial deposits including sandstone blocks were identified in the central and southern portions of Unit 1. No free groundwater was observed; and
- **Unit 2** characterised by the South Creek Soil Landscape, comprising alluvium infilled valley floor deposits of Claremont Creek composed of bands and lenses of clayey silt, clayey sand, sand and silty clay, with soft to hard consistency. Bedrock was not encountered with excavations limited to 3m bgl. Free groundwater was encountered at depths of 2.9 to 3 m in three (3) test pits along a potential intermittent watercourse, located at the low point in the centre of the UWS land at the boundary of Unit 1 and Unit 2.

2.5 REGULATORY NOTICES

DP (2007a) conducted a search of the NSW EPA website (11 March 2006) indicating that:

- No licenses or notices have been issued for the site under the Protection of the Environment and Operations Act (1997);
- No notices have been issued for the site under the Environmentally Hazardous Chemicals Act (1985);
- No notices have been issued for the site under Section 5 of the Unhealthy Building Land Act (1990); and,
- No notices or orders to investigate or remediate have been issued for the site under the Contaminated Land Management Act (1997).

DP (2007a) did not conduct a search of the WorkCover NSW database for licences to keep dangerous goods on the UWS site.

2.6 HYDROGEOLOGY

A search of registered groundwater bores was undertaken by WSP through the Department of Natural Resources. The search identified 7 bores located within a 2 km radius of the site. Three bores located approximately 2km to the north-west are for waste disposal and four bores located approximately 1.5km to the south east are monitoring bores.

The three waste disposal bores were drilled between 1962 and 1963, are owned by the federal government and are located on historical Defence land. It is currently assumed that these waste disposal bores would have been for sewer injection, as the local soil formation (Blacktown Soils Group) would be unsuitable for the use of septic systems. Groundwater encountered in the waste disposal bores were described as 'brackish' and 'salty'.

DP (July 2007a) did not undertake a detailed groundwater study, however, DP identified the following information based on previous studies of areas underlain by the Wianamatta Group and Quaternary alluvium in Western Sydney:

- Shales have a very low intrinsic permeability and groundwater flow is likely to be dominated by fracture flow with typically low yields (< 1L/s) in bores;
- The groundwater in the Wianamatta Group is typically brackish to saline with total dissolved solids (TDS) in the range 4000 – 5000 mg/L, the dominant ions being sodium and chloride and the water being generally unsuitable for livestock or irrigation; and,
- Groundwater flow in unconsolidated Quaternary deposits is likely to be by porous flow in sandy horizon, typically fresh (TDS < 500 mg/L) and dominated by sodium and bicarbonate ions.

2.7 TOPOGRAPHY AND SURFACE WATERS

The site is characterised by two geomorphic units as identified by DP (July 2007b) including Unit 1 which slopes from a ridgeline at the west towards the eastern portion of the site identified as Unit 2. Unit 2 is characterised by a gently sloping valley floor which has been modified by earth works which form retention barriers to protect adjacent properties from flooding.

The surrounding land gently slopes from north to south in the direction of Claremont Creek, a tributary of South Creek. Natural site soils have been reworked to construct the retention barriers around Unit 2.

The majority of the site is grassed with scattered bushland. During the field works the ground on the eastern portion of the site (Unit 2) was saturated as this area forms a natural drainage system.

2.7 SURROUNDING LAND USE

The surrounding land uses have been identified as follows:

- North – Rural/Residential property;
- South – Cobham Remand Centre, primary school, vacant lot and further south Claremont Creek;
- East –Rural/residential properties and land operated by Sydney Water; and
- West – University of Western Sydney.

The adjacent Sydney Water property (upgradient of the UWS Site) has been subject to contamination investigations and a Site Audit Statement was completed for the site. DP (2007a) reviewed these reports and identified the following issues:

- Ten (10) underground storage tanks (USTs) were removed from the site, extending to around 3 m bgl with excavations extending below this depth into the natural clay. The excavated material from the tankpit was stockpiled onsite.

- The tankpit was validated and backfilled with some of the stockpiled material;
- Soil from the backfilled tankpit was later analysed and found to exceed soil guidelines;
- Further excavation was undertaken to remove the contaminated soil. The tankpit was validated and backfilled with imported shale.
- A Phase 2 Assessment by Sinclair Knight Mertz (SKM) identified TPH exceedance below concrete hardstand, pesticides adjacent to building (associated with pest spraying), trace concentrations of VOCs beneath building K and minor exceedences of ecological criteria for heavy metals in soils.
- Groundwater monitoring wells were installed and sampled, and no groundwater contamination was identified.
- The Site Audit Report (SAR) determined the site was suitable for ongoing use as a depot but was not assessed for residential or open space land uses, and that remediation was required beneath the buildings which should be undertaken during demolition.

3 Site History

3.1 SITE HISTORY SUMMARY

General site history information is provided by Phase 1 Investigations conducted by Douglas (DP 2007a). A summary of the site history is provided in Table 3-1 and the following sections.

In summary, the site is believed to have been used for rural/residential and rural/commercial purposes under various landowners from the 1920s until purchased by the government in 1954. There are no available records indicating the landuse between 1954 and 1991, with the site most likely vacant or continued rural and agricultural use. The site use was changed to educational in 1991, however no permanent facilities were constructed between 1991 and 2009.

3.2 AERIAL PHOTOGRAPHS

Aerial photographs for 1947, 1961, 1970, 1982, 1994, 2002 were reviewed by DP (April 2007a) for the Werrington sub-precinct as a whole site. **Table 3-2** summarises the key information obtained from historical site aerial photographs on landuse change. However, copies of the aerial photographs were not made available to WSP and the information presented below is based on the information provided by DP (April 2007a).

Table 3-2 Historical Aerial Photo Review

Date of Aerial Photograph	Description of Subject Site	Description of Surrounding Areas
1947	A large oval track on the western portion of the site, perhaps used for horse training, consists of bare earth surrounded by low lying vegetation. Oval track appears overgrown and no longer in operation. Uniform rows on the eastern portion of the site suggest agricultural operations, with some dirt tracks visible in the southern portion of the site, linking small buildings.	Low lying vegetation, indicating agricultural operations. Small buildings, possibly sheds and/or residential premises on the southern portion of the site.
1961	Little change from 1947 photo. Oval track now derelict and overgrown.	-
1970	Little change from 1961 photo.	Two buildings are present on the Thorndale lot. These appear consistent with the current structures on this site.Two small residential properties to the South of the site on the current Fornari property. Sydney Water depot present in the north-east corner of the site.
1982	Little change from 1970 photo.	-
1994	Little change from 1982 photo. Rectangular section of land in the centre of the UWS site appears as cleared land, no activities apparent in this area which is surrounded by vacant, vegetated land.	Minor extensions to the buildings on the Thorndale lot. Roads surrounding the site have been sealed and the juvenile correctional centre is present on the south-western boundary of the site.

Date of Aerial Photograph	Description of Subject Site	Description of Surrounding Areas
2002	Little change from 1994 photo. There has been additional clearing of land in the centre of the site, with a long narrow rectangle, a diamond shape and two circles.	-

3.3 SENSITIVE ENVIRONMENTS

The nearest sensitive environments are as follows:

- Residential – residential dwellings are located approximately <50 m north and east (up gradient of the site);
- Primary school – temporary school located on the adjacent site to the south; and,
- Ecological – the nearest ecological receptor is Claremont Creek located approximately 250m south of the site.

3.4 PREVIOUS INVESTIGATIONS

3.4.1 DP (2007a) Report on Phase 1 Contamination Assessment, South Werrington Sub Precinct, April 2007.

Douglas were commissioned by the University of Western Sydney and South Werrington Planning Co-ordination Group to conduct a Phase 1 Investigation for the South Werrington Sub Precinct, which comprised 14 individual property lots including residential, commercial and recreational/open space land uses. The South Werrington Sub Precinct included the area of the current WSP investigation.

A site inspection was conducted by Douglas in February and March 2007, following which Douglas identified 12 Areas of Environmental Concern (AEC). The following AECs were identified by DP (2007a) on the UWS site:

- AEC 4 (part of) extends onto the UWS property from Lot 2 DP 132721 to the east, with evidence of former building footprints and building rubble comprising brick and tile pieces and fibro cement pieces.
- AEC 5 was located on the southern boundary of the UWS land and included abandoned waste stockpiles including corrugated iron sheets, kitchen cupboards metal chests and fibro cement.
- AEC 8 – areas of filling covered with vegetation, along the northern and north-eastern boundary of the UWS boundary.
- Observations made of former building structures that may potentially contain hazardous materials such as asbestos, leaded paint and PCBs.

3.4.2 Data Integrity Assessment

The data obtained from these historical sources has been found to be in general agreement with the findings of the WSP Preliminary Phase 2 Environmental Assessment. However, during fieldworks WSP did not identify evidence of former building footprints or building rubble at AEC 4 at the surface or at depth in testpits. The abandoned waste stockpiles identified as AEC 5 were observed by WSP to be located on the adjacent lot, outside the property boundary of the current investigation. No evidence of waste was observed at the surface or at depth in testpits. The areas of filling identified in AEC 8 were observed by WSP to comprise works associated with flood control, with a retention wall formed from reworked site sourced soils.

4 Data Quality Objectives (DQO)

Data Quality Objectives (DQO) were developed for the investigation in consultation with the Auditor as outlined in the letter dated 10 December 2008. DQO are discussed in the following section.

4.1 ESTABLISHING DQO

The DQO process consists of seven steps, which are designed to clarify the study objectives, define the appropriate type of data and specify tolerable levels of potential decision errors. The seven-step DQO process adopted is as follows:

- Step 1 – Defining the Problem. The first step in the DQO process is to 'define the problem' that has initiated the investigation;
- Step 2 – Identify the Decision. The second step in the process is to define the decision statement that the study will attempt to resolve;
- Step 3 – Identify Inputs to the Decision. In this step, the different types of information needed to resolve the decision statement are identified.
- Step 4 – Define the Study Boundaries;
- Step 5 – Develop a Decision Rule;
- Step 6 – Specify Limits on Decision Errors; and
- Step 7 – Optimise the Design for Obtaining the Data.

Step 1 - Defining the Problem

UWS require an understanding of the contamination status of the site; any potential risks to human health and/or the environment; subsequent liabilities for the proposed residential land use; and, whether further works are required to manage any residual risks.

Step 2 - Identify the Decision

The relevant decision statement for the Phase 2 works is:

"Does any contamination occur at concentrations that pose an unacceptable risk to human health, the environment and / or the proposed sensitive land use, when assessed against sensitive landuse criteria NEPM HIL A Residential? If so, what is the order of priority to minimise the risk and what are the most technically robust and cost effective measures that could be adopted to mitigate or manage the risk?"

Step 3 - Identification of Inputs into the Decision

Based on the historical information and the findings of DP (2007a), the contaminants of potential concern (COPC) in soils that required assessment comprised the following:

- Heavy metals (M8) including arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Organo-chlorine pesticides (OCP) and organo-phosphate pesticides (OPP);
- Polychlorinated Biphenyls (PCB);
- Total phenols;
- Polycyclic aromatic hydrocarbons (PAH);

- Benzene / toluene / ethyl benzene / xylene (BTEX);
- Total petroleum hydrocarbons (TPH); and
- Asbestos.

COPC for groundwater include

- heavy metals;
- TPH;
- BTEX;
- PAH;
- total phenols; and,
- chlorinated solvents.

Key data required to resolve the project problem included concentrations of COPC in near surface soils and groundwater collected from across the site.

Observations on soil type and in situ measurements (e.g. photo ionisation detector) are also important information used to assist in assessing potential presence and distribution of hydrocarbon based contamination.

Step 4 - Defining the Study Boundaries

The soil sampling works included systematic sampling on a grid as well as targeted sampling locations in identified AECs. Investigations were conducted to a maximum depth of 8 m below current ground level. A total of 3 groundwater monitoring wells were installed in AEC 4 and AEC 8 and a third well at the western end of AEC 8 to provide triangulation for site coverage. The physical study boundaries includes the subject site (i.e. Lot 1 DP 791299). The time boundaries are limited to conditions encountered during the site works. **Figure 3, Appendix A** identifies the sample locations and the site investigation boundaries.

Step 5 - Developing Decision Rules

The proposed guidelines values include the following:

- NEPM (1999) HIL A for residential land use with access to soils;
- NSW EPA (1994) Service Station Guidelines for sensitive land use;
- Asbestos below the detection limit of the test; and,
- ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality – Freshwater guidelines with 95% level of protection.

Where the COPC are present at concentrations that fall below the site specific criteria then it will be concluded that the site is suitable for the proposed residential land use.

In accordance with the DECC (2006) *Contaminated Sites: Guidelines for the NSW Site Auditor Scheme* WSP also considered the NEPM (1999) Provisional phytotoxicity-based investigation levels (PPIL's) for heavy metals within the context of the proposed development at the site.

In accordance with DECC 2006, soil data was compared against the health-based investigation levels for residential land with access to soils. For the site to be considered suitable for residential use, the following statistical criteria were adopted with respect to soils:

- Either - the reported concentrations are all below the site criteria;
- Or: for non volatile contaminants only - the upper 95% confidence limit on the average site concentration for each analyte must be below the adopted site criterion; no single analyte concentration exceeds 250% of the adopted site criterion; and, the standard deviation of the results must be less than 50% of the site criteria.

Where COPC are present at concentrations that exceed the site specific criteria, WSP has provided recommendations for any further investigation, management and / or remedial works that are deemed necessary to facilitate the proposed sensitive land use, protect the groundwater environment and / or human health.

Step 6 - Specify Acceptable Limits

The precision, accuracy, repeatability, completeness and comparability of the data generated during the project will be assessed against the DQOs. The acceptable limits for data QA will be the following:

Accuracy

Definition: the nearness of an averaged result to the true value, where all random errors have been statistically removed. Accuracy is measured by percent recovery '%R'.

Recovery data shall be categorised into one of the following Adopted Quality Parameter (AQP) control limits:

- general analytes (70 to 130% R);
- phenol analytes (50 to 130%R);
- OCP (60 to 130%R); and
- phenoxy acid herbicides (50 to 130%R).

QA/QC data exhibiting values varying from the acceptable AQP control limits shall require a descriptive brief explaining the likely circumstances.

Precision

The degree to which data generated from replicate or repetitive measurements differ from one another due to random errors. Precision is measured using the standard deviation 'SD' or Relative Percent Difference '%RPD'. Acceptable replicate data is expected to conform to the following AQP control limits:

Relative Percent Difference is expressed as:

$$\%RPD = \left| \frac{A - B}{A + B} \right| x200$$

Where A is the concentration of an analyte in the original sample and B is the concentration of the same analyte in the duplicate sample.

Inorganic and Organic Control Limits:

- Should not exceed 50%RPD for general contaminants (30%RPD for metals) at concentration levels greater than ten times the practical quantition limit (PQL) / estimated quantition limit (EQL) / limit of reporting (LOR).
- Should not exceed 75 %RPD at concentrations between five to ten times the PQL/ EQL/ LOR.
- Should not exceed 100 %RPD at concentration levels less than two times the PQL/ EQL/ LOR.

QA/QC data exhibiting values varying from the acceptable AQP control limits require a descriptive brief explaining the likely circumstances.

Duplicate Samples

Field generated check samples, which measure repeatability over a short time period. In accordance with AS4482.1 (2005) Guide to the Investigation and Sampling of Sites with Potentially Contaminated Soil, at least 1 in every 20 samples (5%) were submitted from a larger quantity of sample which are to be collected from the same sampling point, removed by a single action, where possible, and divided into two or three separate and unrelated sample containers for analysis at the same laboratory (intra-laboratory precision).

Triplicate Split Samples

Field generated check samples, which measure repeatability between two separate laboratory group methods. In accordance with AS4482.1 (2005) at least 1 in every 20 samples (5%) were submitted from a larger quantity of sample which are to be collected from the same sampling point, removed by a single action, where possible, and divided into two or three separate and unrelated sample containers for analysis at the check laboratory (inter-laboratory precision).

Step 7 - Optimise the Design for the Collection of Data

The purpose of this step was to identify a resource-effective data collection design for generating data to meet the project objectives, which was achieved by implementing the Auditor approved SAQP.

5 Methodology

5.1 SAMPLE STRATEGY

The scope of work for the Phase 2 was prescribed by the NSW accredited Auditor (Mike Hayter of Environ) and included the following:

- Excavation of three, two and five test pits targeted to AEC 4, 5 and 8 respectively;
- Excavation of an additional thirty test pits across the remainder of the UWS property (28.09 Ha) to provide general site coverage, on the condition that should any indicators of contamination be encountered then the requirement for additional investigation would be discussed with UWS and the Auditor. No field observations during site works indicated contamination outside the likely background range; and,
- Drilling of three boreholes to a maximum depth of 8 metres below ground level or to v-bit refusal in the underlying natural shale material. Each borehole was installed with a groundwater monitoring well for subsequent sampling and laboratory analysis. The wells are located in AEC 4 and AEC 8 as requested by the Auditor with a third well located at the western end of AEC8 to provide good triangulation for assessing the groundwater quality in the vicinity of the Sydney Water Depot, adjacent to the eastern boundary of the Site.

5.2 SOIL SAMPLING METHODOLOGY

Soil samples were collected from 40 test pits which were excavated to a maximum depth of 3 m bgl using a mechanical excavator. As agreed with the Auditor, test pits were excavated until 1 m of natural material was reached, up to a maximum of 3 m bgl. Soil samples were collected with a gloved hand from the excavator bucket at the surface (0.1-0.4m) and from the natural material (typically 0.7 – 1.5 m bgl). In addition, soil samples were collected from three (3) boreholes drilled to install groundwater monitoring wells. Soil samples were collected with a gloved hand from the auger at the surface (0.1-0.4 m bgl) and from natural material (0.4 – 3 m bgl) to a maximum depth of 8 m bgl.

Sufficient sample material was collected to allow both field screening of soils with a PID and laboratory analyses. Each soil sample was described using the Unified Soil Classification System (USCS), and details of any discolouration, staining, odours or other indicators of contamination were also noted. Test pit and borehole logs are included in **Appendix B**.

Collected soil samples were immediately transferred to appropriate sample containers (250 mL glass jars). The sample labels included: job number and/or client name; sample identification number; and date and time of sampling.

For sample integrity, new nitrile gloves were replaced between each sampling event. For preservation in accordance with NEPC (1999) samples were then stored in an ice filled esky to keep the samples below 4.0°C and couriered to the laboratory with the signed chain of custody form filled out with the required analysis.

Chain–of-custody procedures are used to track samples, discourage tampering, and provide a sampling summary. The following information was included on the chain–of-custody form:

- sample number;
- signature of sampler;
- date and time of collection;
- place of collection;
- type of sample;
- number and type of container;

- inclusive dates of possession; and,
- signature of receiver.

5.3 GROUNDWATER SAMPLING METHODOLOGY

Groundwater monitoring wells were developed using a stainless steel bailer to remove sediment from within the well on 23 January 2009. Wells were considered to be developed once purged water showed stabilised field parameters or once wells were purged dry. Development equipment was decontaminated between wells with a phosphate free detergent.

Groundwater sampling of all three (3) wells was undertaken on 30 January 2009. Prior to sampling, standing water levels were measured in all monitoring wells using an interface probe.

Groundwater was purged from each well using a peristaltic pump and field parameters including dissolved oxygen (DO), temperature, pH, electrical conductivity (EC) and redox (ORP) were measured at intervals. Purging was considered complete once the field parameters stabilised + / -10% or when the well was purged dry. Groundwater samples were collected using the peristaltic pump directly into new, clean, laboratory prepared bottles and immediately placed in an iced Esky to keep samples below 4^{o}C. Each sample was labelled with the project number, sampling date and unique sample identifier. The sample information was recorded on a chain of custody form, detailing the receiving laboratory location, required analyses and turn around times.

Well purge data record sheets completed for each well are included in **Appendix B** detailing the sampling date, project number, operator, well ID, weather, gauge data, water quality data and general comments. Samples were transported directly to the primary laboratory in Sydney within adequate time to allow technical holding times for analysis to be achieved.

5.4 LABORATORY ANALYSIS AND METHODS

Table 5-1 outlines the laboratory analysis undertaken for soil and groundwater samples. A detailed QA/QC assessment is included in **Appendix E**, which outlines the analytical methods.

Table 5-1 Analytical Suite

Environmental Media	Analytical Suite
Soil	Heavy metals (M8), OPP, PCB, Total phenols, PAH, BTEX, TPH and asbestos.
Groundwater	M8, total phenols, PAHs, BTEX, TPH and VHCs

5.5 QUALITY ASSURANCE/QUALITY CONTROL (QA/QC)

For any given project, all investigation data are potentially subject to sampling and data reduction errors. Data quality objectives are therefore established to control the sources of errors and quantify the errors whenever possible. Quality control (QC) procedures are designed to both increase sample data quality and help interpret discrepancies in results.

All work was conducted in accordance with industry-accepted standards and quality assured procedures. Field quality control included rigorous sample collection, decontamination procedures, and sample documentation.

WSP implemented QC procedures during soil sampling by collecting representative QC samples for subsequent laboratory analyses. Following these analyses, laboratory and sampling data quality objectives were analysed and reported in terms of data precision, accuracy, and completeness.

Two (2) duplicate soil samples and two (2) triplicate samples as well as one (1) duplicate groundwater sample were collected for quality assurance to assess the precision, accuracy and comparability of the laboratory analyses. WSP standard field procedures require that samples are collected from discrete locations, are not composited and field duplicates and triplicates are collected at a rate of one (1) sample per ten (10) soil samples and groundwater samples.

Laboratory Quality Assurance (QA) and Quality Control (QC) procedures included sample spikes for organic analysis. The results of the QC testing are presented in the laboratory reports, which also indicate how much of a particular analyte was recovered. Duplicate testing is undertaken by the laboratory to compare the results obtained in analysing samples.

6 Assessment Criteria

6.1 REGULATORY GUIDELINES

The following relevant guidelines have been "made or approved" by the NSW EPA under Section 105 of the *Contaminated Land Management Act 1997* for any purpose related to the objects of the Act:

- National Environment Protection (Assessment of Site Contamination) Measure, National Environment Protection Council, 1999 (NEPC 1999)
- Contaminated Sites: Guidelines for Assessing Service Station Sites, NSW EPA, 1994 (EPA 1994)
- Contaminated Sites: Sampling Design Guidelines, NSW EPA, 1995 (EPA 1995)
- Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites, NSW EPA, 1997 (EPA 1997)
- Contaminated Sites: Guidelines for the NSW Site Auditor Scheme, 2nd Edition, NSW EPA, 2006 (EPA 2006)

6.2 SOIL CRITERIA

The site is proposed for development with the most sensitive landuse to be residential with access to soil. In accordance with the decision process for assessing urban redevelopment sites (NEPC 1999), concentrations of contaminants detected in soil samples were compared against the health-based soil investigation levels for Residential with gardens and accessible soil (NEPM HIL A) and provisional phytotoxicity based investigation levels (PIL) as listed in **Table 6-1.** NSW EPA (1994) Services Station Guidelines have been applied for TPH and BTEX compounds as these are not included in the NEPM guidelines. There are currently no national or DECC-endorsed guidelines relating to human health or environmental investigation of material containing asbestos and/or OP Pesticides.

6.3 GROUNDWATER CRITERIA

The groundwater assessment criteria for BTEX, TPH, PAH, VHCs and metals have been taken from the ANZECC/ARMCANZ (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (referred to as ANZECC (2000)) and the National Environment Protection (Assessment of Site Contamination) Measure (1999) Schedule B (1) Groundwater Investigation Levels, Aquatic Ecosystems, Fresh Waters, and/or the NSW DEC (1994) *Contaminated Sites – Guidelines for Assessing Service Station Sites*.

The ANZECC (2000) water quality guidelines specify four sets of trigger values corresponding with different levels of protection for ecosystem conditions. Trigger values, derived using the statistical distribution method, relate to the protection of 99%, 95%, 90% and 80% of species in an aquatic ecosystem. The guidelines recommend that, in most cases, the 99% protection trigger values should be applied to ecosystems with high conservation value and the 95% protection trigger values should be applied to "slightly to moderately disturbed" ecosystems. Due to the proximity of the site to the nearest receiving water body is Claremont Creek, a tributary of South Creek, and that the site is located in a developed area, the 95% protection trigger values for freshwater have been adopted.

There are no current Australian guidelines for TPH and the guidelines presented in the *Dutch (2000) Environment Quality Objectives* have been used as a screening level only.

The applicable groundwater criteria for the site are outlined in **Table 6-2**.

Table 6-1 Soil Criteria (all units in mg/kg)

Analyte	Limit of Reporting	(NEPM– A)[1] mg/kg	(NEPM– PIL)[2] mg/kg
METALS			
Arsenic	1	100	20
Cadmium	0.1	20	3
Chromium (III)	1	12000	400
Copper	2	1000	100
Nickel	1	600	60
Lead	2	300	600
Zinc	5	7000	200
Mercury (inorganic)	0.05	15	1
POLYCYCLIC AROMATIC HYDROCARBONS			
Benzo(a)pyrene	0.5	1	-
Total PAH's	8	20	-
ORGANOCHLORINE PESTICIDES			
Aldrin + Dieldrin	0.05	10	-
Chlordane	0.1	50	-
DDT + DDD + DDE	0.15	200	-
Heptachlor	0.05	10	-
TOTAL PETROLEUM HYDROCARBONS			
C6 – C9 Fraction	10	65[3]	-
TPH (C9 – C36) Fraction	250	1,000[3]	-
Benzene	0.2	1[3]	-
Toluene	0.5	1.4[3]	-
Ethylbenzene	1	3.1[3]	-
Xylenes	1	14[3]	-
Other			
Phenols		8,500	-
PCBs		50	-
Asbestos	Presence	NIL	-

Notes:

[1] Column 1 (NEPM – A), Health-based Investigation Levels (NEPC 1999)

[2] Column 5 (NEPM – PIL), provisional Phytotoxicity Based Investigation Levels (NEPC 1999)

[3] Table 3 (NSW EPA 1994)

Table 6-2 Groundwater criteria

Contaminant	ANZECC 2000 Freshwater 95%[a] (ug/L)
Heavy Metals	
Arsenic (V)	13
Cadmium	0.2
Chromium (VI)	1
Copper	1.4
Lead	3.4
Manganese	1900
Mercury	0.6
Nickel	11
Zinc	8.0
Hydrocarbons	
Benzene	950
Toluene	140[b]
Ethylbenzene	300[b]
o-xylene	350
p-xylene	200
Xylene total	380[b]
TPH C6-C9	
TPH C10-C36	600[c]
Total PAHs	
Benzo(a)pyrene	0.1[d]
Naphthalene	16
Phenols	320

Notes:

a. ANZECC (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* – Freshwate

b. NSW EPA (1994) Service Station Guidelines

c. Dutch (2000) Environment Quality Objectives in the Netherlands Ministry of Housing, Spatial Planning and the Environment

d. ANZECC (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality – Freshwater and marine low reliability 99% trigger value (section 8.3.7.7 (pg193)), note this is an indicative interim value.

7 Soil Analytical Results and Observations

7.1 FIELD OBSERVATIONS

Test pits and boreholes were excavated on 15 and 16 December and 27 January 2009 and the following observations were made:

- The eastern portion of the site was between 1 m and 1.5 m lower in elevation than surrounding areas with surface saturated areas indicating regular flooding and retention of water. A mound of earth (approximately 2 m wide) on the northern and eastern sides of this area acts as a retaining wall to restrict flooding of adjacent residential properties.
- A number of manhole covers were identified by a service locater, indicating the presence of sewer lines beneath the site. A redundant fibre cement pipe was encountered at a depth of 0.3 m below ground level (bgl) on the western side of the site (**Figure 3, Appendix A**). No other underground services or USTs were identified.
- Small structures in the south-western area of the site included a shelter shed, toilet, shed and a workbench and 3 empty drums (unlabelled). There was no observed staining of surfaces or leaks from the empty drums, and these locations were targeted with test pits at TP15, TP19 and TP20.
- The site is easily accessed by members of the public and illegal dumping of waste materials may have occurred in the past, however, the site is monitored by a 24-hour security patrol by UWS campus security.
- The site is intermittently fenced along boundaries with different properties including:
    - no fence on the western boundary with Werrington North campus of UWS;
    - 1-1.2 m high picket and wire fence along the boundary with PARED (eastern corner);
    - 2 m high cyclone fence along the boundary with the rail corridor (northern boundary) and with Sydney Water (eastern boundary); and,
    - 2 m high 'Colourbond' fence along the boundary with residential properties (northern boundary).
- During the site inspection, the natural vegetation appeared to be in healthy condition, with no obvious signs of disturbance or stress.
- The surface soils (0.0 – 0.5 m bgl) encountered during the fieldworks generally comprised natural topsoils typically described as dark brown, clayey silt with organic matter.
- Natural material (0.3m – 3.0 m bgl), generally comprised orange, brown and grey clay with red/orange mottling in various stages of weathering as indicated by calcium carbonate nodules, ironstone fragments, sandstone fragments and changes in colour with depth. Charcoal fragments and were also present in the natural material, likely from natural deposition. Lenses of sand and rounded gravels in the southern portion of the site indicate fluvial deposition. Variations in natural material across the site reflect the characteristics identified by DP (2007b) in the two geomorphic units:
    - **Unit 1** characterised by residual soils at least 3m thick composed of clay, silty clay and clayey silt with some ironstone nodules, typically hard consistency with shale encountered at depths of 2.0 to 2.5 m bgl.
    - **Unit 2** characterised by alluvium infilled valley floor deposits composed of bands and lenses of clayey silt, clayey sand, sand and silty clay, with soft to hard consistency.
- No staining, malodours or discolouration of soils was observed and a maximum of 0.0 ppm was recorded with a PID for soil samples. Plastic fragments were observed at a depth of 0.8m bgl in reworked natural material forming the retention wall (AEC 8).

No fibre cement fragments were observed on the surface or in soils at the site during WSP site works, however a fibre cement pipe was encountered near TP04. Soils were moist to damp, with no evidence of groundwater flow observed in the soil profile.

Soil descriptions for all sample locations are included in bore logs in **Appendix B**.

7.2 SOIL ANALYTICAL RESULTS

The soil sampling locations are shown in **Figure 3, Appendix A** and summarised laboratory results are presented in **Appendix C**. Detailed laboratory reports and chain of custody documentation is provided in **Appendix D**.

7.2.1 Metals

Concentrations of heavy metals in soils were below the health-based criteria for Residential with gardens and accessible soils including secondary schools (NEPM HIL A) and provisional Phytotoxicity based Investigation Levels (PIL) in any of the soils selected for analysis.

7.2.2 PAHs

PAH concentrations in all soil samples were below the laboratory detection limits.

7.2.3 TPH

TPH concentrations in all soil samples were below the laboratory detection limits.

7.2.4 BTEX

BTEX concentrations in all soil samples were below the laboratory detection limits.

7.2.5 OCPs/OPPs

OCP and OPP concentrations in all soil samples were below the laboratory detection limits.

7.2.6 PCBs and Phenols

PCBs and Phenols concentrations in all soil samples were below the laboratory detection limits.

7.2.7 Asbestos

No fibre cement fragments were identified in any test pits or boreholes during the field works conducted by WSP. No asbestos fibres were identified in any of the forty-nine (49) soil samples analysed for asbestos. A fibre cement pipe was encountered near TP04 (as marked in **Figure 3, Appendix A**) and a fragment of the pipe was analysed for asbestos. Laboratory results indicated that the fibre cement pipe contained chrysotile, amosite and crocidolite asbestos.

7.3 DATA QUALITY ASSESSMENT

7.3.1 Field QA/QC

The following QA/QC soil samples were collected in the field:

- DUP1 was a intralab duplicate of soil sample TP06-1;
- TRIP1 was a interlab duplicate of soil sample TP06-1;
- DUP2 was a intralab duplicate of soil sample TP19-1; and,
- TRIP2 was a interlab duplicate of soil sample TP19-1.

A detailed QA/QC report is provided in Appendix E.

Overall, there is an acceptable level of agreement between the original and duplicate/triplicate samples indicating that field procedures were adequate in obtaining representative samples and minimising the potential for cross-contamination. Several exceedences of the acceptable RPD criteria for heavy metals were recorded in all duplicate and triplicate samples, as outlined in Table E1, Appendix E.

The result that exceeded the acceptability criteria are flagged in Table 1, Appendix E. The variability observed reflects the relatively low concentration detected, and may be affected by the matrix interference recorded by the laboratory. A detailed QA/QC report including relative percentage difference (RPD) calculations is included in the QA/QC assessment report in Appendix E.

Sample integrity, container requirements and holding time compliances were documented as acceptable. Both the sample and laboratory accuracy were acceptable given the nature and inherent uncertainties described above.

Although no rinsate samples were obtained, the fact that the results were generally below the detection limit of the tests, suggests that no cross-contamination occurred during the sampling events between exploratory holes.

8 Groundwater Analytical Results and Observations

8.1 FIELD OBSERVATIONS (PHYSIOCHEMICAL RESULTS)

Groundwater was not encountered in any of the 40 test pits excavated to a maximum depth of 3 m bgl. Groundwater was encountered during the drilling of 3 boreholes at MW101, 102 and 103 which extended to a maximum depth of 8 m bgl. Perched groundwater was observed at depths of approximately 5.8m bgl and 6 m bgl in natural clay soils.

Groundwater encountered during the January 2009 monitoring event was generally slightly turbid and yellow to brown in colour after purging with no obvious odour. The physiochemical parameters recorded during purging are presented in **Table 8-1**.

Table 8-1 Groundwater Physiochemical Parameters

Well ID	Standing Water Level (m below TOC)	pH	Temperature (^{o}C)	Conductivity (uS/cm)	DO (ppm)	Redox (mV)	Observations
GW101	4.98	6.48	19.97	3116	8.98	156.9	Yellow, slightly cloudy, no odour. Purged Dry after 5L.
GW102	3.55	6.55	19.19	3194	10.19	188	Yellow-brown, slightly cloudy, no odour.
GW103	4.98	6.04	20.17	3281	5.19	168.1	Orange-brown, cloudy, no odour.

Note: ORP field results converted to Standard Hydrogen Electrode (SHE) readings by adding 199mV to each field value.

TOC – Top of casing

The results in **Table 8-1** indicate the following:

- Groundwater was encountered at a depth of 3.55 and 4.98 m b TOC;
- Groundwater pH ranged between 6.04 and 6.55, which indicates slightly acidic to neutral groundwater conditions;
- The electrical conductivity ranged between 3116 μS/cm and 3281μS/cm, indicating generally saline groundwater conditions;
- ORP (oxidation reduction potential) levels ranged between 156.9 mV and 188.1 mV indicating oxidising conditions corrected to SHE. ORP (or redox) is a measure of a water system's capacity to either release or gain electrons in chemical reactions; and,
- The temperature of the groundwater ranged between 19.19 and 20.17 degrees Celsius.

GW101 was initially purged dry after 5L and was sampled following recharge. Well purge data record sheets completed for each well are included in Appendix B detailing the sampling date, project number, operator, well ID, weather, gauge data, water quality data and general comments.

8.2 GROUNDWATER ANALYTICAL RESULTS

The groundwater monitoring well locations are shown in **Figure 3, Appendix A** and summarised laboratory results are presented in **Appendix C**. Detailed laboratory reports and chain of custody documentation is provided in **Appendix D**.

8.2.1 Heavy Metals

The laboratory detection limit was increased above the guideline value due to matrix interference for arsenic, chromium and copper, with all concentrations of these metals being below the laboratory detection limit.

Concentrations of heavy metals in groundwater exceeded the ANZECC (2000) 95% Freshwater guideline for:

- Cadmium in all samples with a concentration of 0.4 ug/L (above guideline value of 0.2 ug/L);
- Lead at MW101 with a concentration of 6 ug/L and MW103 with a concentrationof 9 ug/L (above guideline value of 3.4 ug/L);
- Zinc at MW101 with a concentration of 33 ug/L, MW102 with a concentration of 48 ug/L, and MW103 with a concentration of 30 ug/L.

While the concentrations of heavy metals exceeded the ANZECC (2000) 95% freshwater criteria, these concentrations represent regional background concentrations of heavy metals in groundwater.

8.2.2 PAHs

Concentrations of PAHs in groundwater were below the laboratory detection limits for all 3 monitoring wells.

8.2.3 TPH

Concentrations of TPH compounds in groundwater were below the laboratory detection limits for all 3 monitoring wells.

8.2.4 BTEX

Concentrations of BTEX compounds in groundwater were below the laboratory detection limits for all 3 monitoring wells.

8.2.5 Phenols

Concentrations of Phenols in groundwater were below the laboratory detection for all 3 monitoring wells.

8.2.6 VHCs

Concentrations of VHCs in groundwater were below the laboratory detection limits for all 3 monitoring wells.

8.3 DATA QUALITY ASSESSMENT (PENDING FINAL LABORAOTORY RESULTS)

8.3.1 Field QA/QC

The following QA/QC soil samples were collected in the field:

- DUP1 was a intralab duplicate of groundwater sample MW103;

A detailed QA/QC report is provided in Appendix E.

Overall, there is an acceptable level of agreement between the original and duplicate/triplicate samples indicating that field procedures were adequate in obtaining representative samples and minimising the potential for cross-contamination. One (1) exceedance of the acceptable RPD criteria for Cadmium was recorded.

A detailed QA/QC report including relative percentage difference (RPD) calculations is included in the QA/QC assessment report in Appendix E.

Sample integrity, container requirements and holding time compliances were documented as acceptable. Both the sample and laboratory accuracy were acceptable given the nature and inherent uncertainties described above.

8.3.2 Laboratory QA/QC

Laboratory QA/QC comprised of chain-of-custody requirements, sample integrity and holding times, use of acceptable NATA-registered laboratory methods and laboratory QA/QC results. For this project, the Laboratory QA/QC was considered to be acceptable.

9 Conclusions and Recommendations

On the basis of the Phase 1 Investigation, site history, current site condition and results of the Preliminary Phase 2 Environmental Assessment, the site is considered to be suitable for residential land use with gardens and accessible soils.

In order to facilitate proposed future development, WSP recommends that UWS delineate the extent of the asbestos containing pipe identified near TP04 and remove the pipe in accordance with current best practice.

10 References

Standards Australia, (1997), Australian Standard AS4482.1 – 1997 Guide to the sampling and investigation of potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds.

ANZECC/ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality

DP (2007a) Report on Phase 1 Contamination Assessment, South Werrington Sub Precinct, April 2007.

DP (2007b) Report on Land Capability Assessment, South Werrington Sub Precinct, July 2007)

Dutch (2000), Environment Quality Objectives in the Netherlands, Ministry of Housing, Spatial Planning and the Environment

National Environment Protection Council, 1999 (NEPC 1999) National Environment Protection (Assessment of Site Contamination) Measure,

NSW EPA, 1994 (EPA 1994) Contaminated Sites: Guidelines for Assessing Service Station Sites,

NSW EPA, 1995 (EPA 1995) Contaminated Sites: Sampling Design Guidelines,

NSW EPA, 1997 (EPA 1997) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites,

NSW EPA, 2006 (EPA 2006) Contaminated Sites: Guidelines for the NSW Site Auditor Scheme, 2nd Edition,

Appendix A Figures

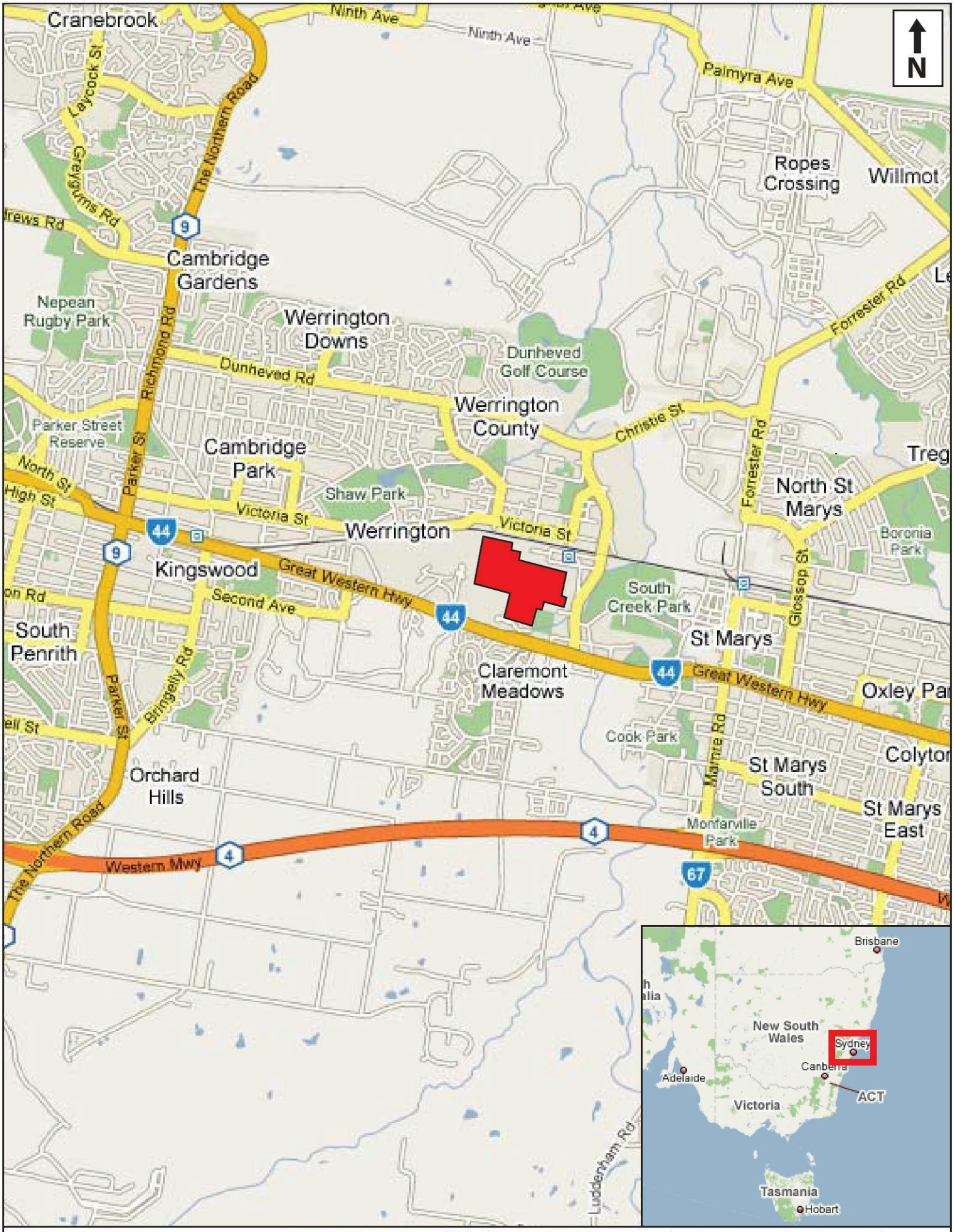
Appendix B Bore Logs and Groundwater Data Sheets

Appendix C Results Tables

Appendix D Laboratory Reports

Appendix E QA/QC Report

Appendix A Figures



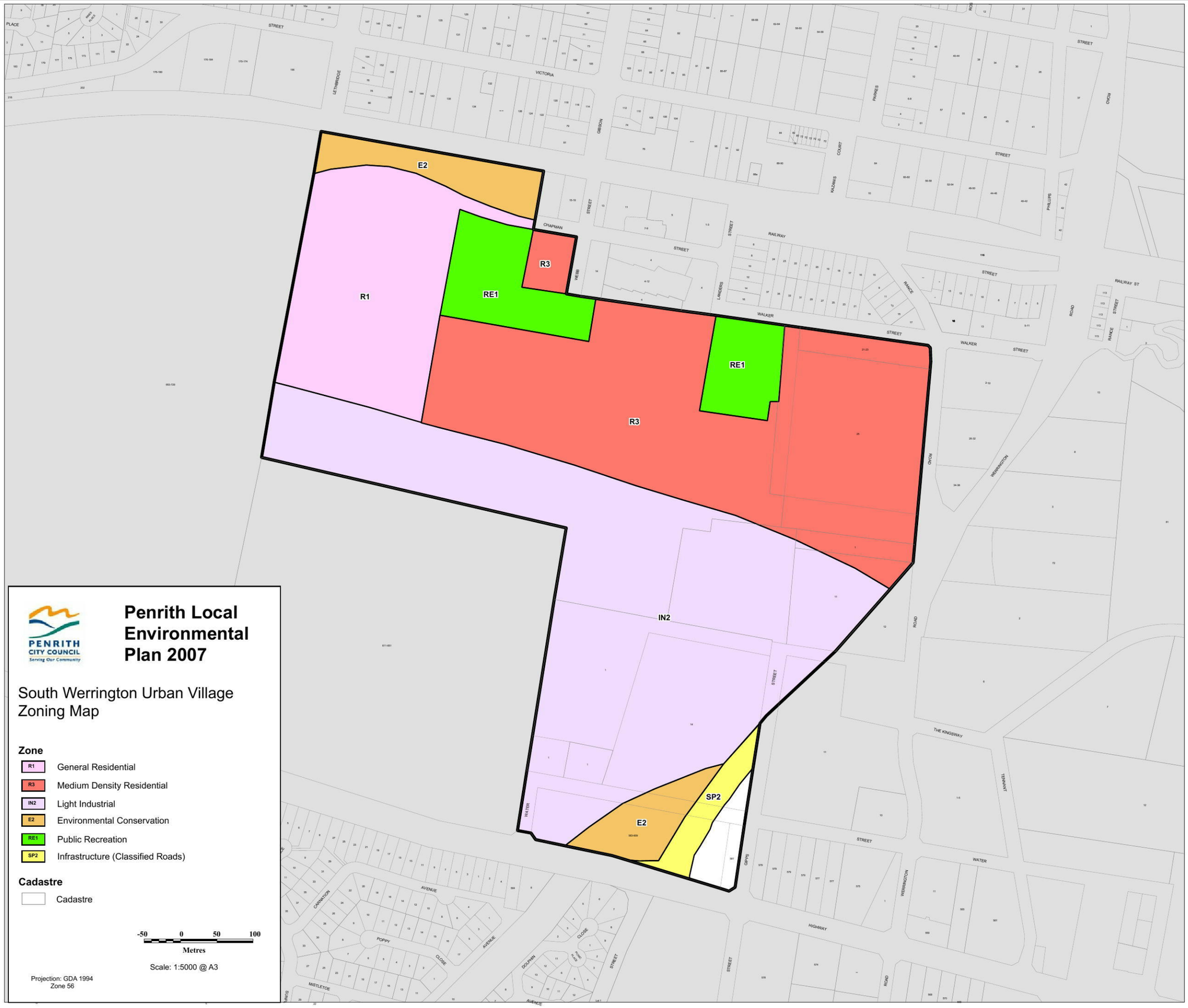
Site Location

Preliminary Phase 2 Environmental Assessment - University of Western Sydney, Werrington, NSW

Figure 1

Site Location

WSP



Penrith Local Environmental Plan 2007

South Werrington Urban Village Zoning Map

Zone

- R1 General Residential
- R3 Medium Density Residential
- IN2 Light Industrial
- E2 Environmental Conservation
- RE1 Public Recreation
- SP2 Infrastructure (Classified Roads)

Cadastre

- Cadastre

-50 0 50 100
Metres

Scale: 1:5000 @ A3

Projection: GDA 1994
Zone 56

Current Zoning - Blacktown City Council

Preliminary Phase 2 Environmental Assessment

WSP

Legend

- Site Boundary
- Estimated Site Boundary
- Testpit
- Pipe (containing asbestos)
- Toilet
- Shelter Shed
- Work Bench and Empty Drums

Testpit and Soil Sample Locations

Preliminary Phase 2 Environmental Assessment - University of Western Sydney, Werrington, NSW

Figure 3

WSP

Plate 1 Looking west from south-east corner of site. Note tall grass, area indundated.

Plate 2 Looking west from centre of site (near sheds). Note the foot-slopes form western portion of site. Light coloured grass is ~1 m in height.

Plate 3 Looking north from south-east corner of site.

Plate 4 Shelter shed in centre of site.

Plate 5 Workbench and drums in centre of site.

Plate 6 Location of test pit 20 (right) adjacent to drums and workbench.

Plate 7 Shed and "toilet" located in centre of site.

Plate 8 Location of asbestos pipe encountered at ~ 0.2. m bgl.

Plate 9 Looking east along northern boundary at AEC 8. Note drop in elevation to right of image.

Plate 10 Abandoned waste stockpiles (AEC5) located offsite, along southern boundary of site.

Plate 11 Looking north-east from southern boundary.

Plate 12 Bushland in centre of site, looking east.

Appendix B Bore Logs and Groundwater Data Sheets

WSP Groundwater - Well Sampling Data Form

Job Information			
Date:	30.1.09	Time: arrive	depart
Project Name:	UWS Werrington	Project Number:	1-08-135
Site Location:	Werrington	Operator:	AA
Well ID:	MW101	Weather:	hot 35°C+

Equipment						
Water quality equipment description:	Hanna					
Interface probe number:						
Purging equipment: (please cirlce)	Bailer type:	Plastic	Teflon			
	Pump type:	(Peristaltic)	Submersible	Micro-purge	Amazon	Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

Total Well Depth (-) Water level (=) Water Column

7.06 m (-) 4.98 m (=) _____ m

~~Bail~~ Reclarge 5.00 Water Column (x) Conversion Factor (=) Litres per 1 Well Volume

_____ m (x) _____ (=) _____ L

Volume of water in well / V
= Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Water Quality Parameters

Beginning purge time: | Ending purge time:

Litres	Time	pH	Temp C	Cond mS/cm	DO ppm	Redox mV	Comments
1		6.90	20.49	30.99	11.8	77.6	purged dry @ 5L
6		6.48	19.97	31.16	8.48	42.1	sampled from reclarge
Stabilisation Criteria		+/- 0.05	+/- 10%	+/- 3%	+/- 10%	+/- 10%	**Example Comments:** clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour

6L **Total Well Volume**
Actual amount of water prior to sampling

**pH, temp, cond readings not necessary if well is purged dry*

Did field parameters stabilise? Y (N) NA Was the well dry purged? (Y) N

Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	(Y)	N		
Was pre-cleaning sampling equipment properly protected from contamination?	(Y)	N		
Was documentation of equipment conducted?	(Y)	N	NA	
Were air bubbles present in vials at time of collection?	Y	(N)	NA	
Was sample for metals field filtered prior to preservations?	(Y)	N	NA	
Duplicate sample collected?	Y	(N)		Duplicate sample ID

WSP Groundwater - Well Sampling Data Form

Job Information

Date:	30.1.09	Time: arrive / depart	
Project Name:	~~HSWS~~ Warrington	Project Number:	1-08-135
Site Location:	Warrington	Operator:	AA
Well ID:	MW102	Weather:	Hot 35°C +.

Equipment

Water quality equipment description: Hanna.

Interface probe number:

Purging equipment: (please circle) Bailer type: Plastic Teflon

Pump type: (Peristaltic) Submersible Micro-purge Amazon Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth (-) Water level (=) Water Column

_____ m (-) _____ m (=) _____ m

Water Column (x) Conversion Factor (=) Litres per 1 Well Volume

_____ m (x) _____ (=) _____ L

Water Quality Parameters

Beginning purge time: Ending purge time:

Litres	Time	pH	Temp C	Cond mS/cm	DO ppm	Redox mV	Comments
5		6.46	20.6	32.42	4.51	-54	cloudy, orange-brown, no odour.
7		6.28	20.26	32.65	6.64	-44.9	
10		6.22	20.23	32.70	6.62	-44	
12		6.06	20.29	32.83	5.09	-32.1	
15		6.04	20.17	32.87	5.19	-30.4	
Stabilisation Criteria		+/- 0.05	+/- 10%	+/- 3%	+/- 10%	+/- 10%	Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour

Total Well Volume
Actual amount of water prior to sampling

*pH, temp, cond readings not necessary if well is purged dry

Did field parameters stabilise? (Y) N NA

Was the well dry purged? Y (N)

Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	(Y)	N	
Was pre-cleaning sampling equipment properly protected from contamination?	(Y)	N	
Was documentation of equipment conducted?	(Y)	N	NA
Were air bubbles present in vials at time of collection?	Y	(N)	NA
Was sample for metals field filtered prior to preservations?	(Y)	N	NA
Duplicate sample collected?	Y	(N)	Duplicate sample ID

WSP Groundwater - Well Sampling Data Form

Job Information			
Date:	30.1.09	Time: arrive	depart
Project Name:	UWS Wernington	Project Number:	1-08735
Site Location:	Wernington	Operator:	AA
Well ID:	MW103	Weather:	Hot 35°C +

Equipment						
Water quality equipment description:	Hanna					
Interface probe number:						
Purging equipment: (please cirlce)	Bailer type:	Plastic	Teflon			
	Pump type:	(Peristaltic)	Submersible	Micro-purge	Amazon	Other:

Well Gauging and Purge Volume Calculations

Casing Diameter	25mm	50mm	100mm	125mm	150mm	200mm	250mm	300mm
Conversion Factor (volume in factor L/m)	0.98	1.96	7.85	31.4	49.1	70.7	125.7	196.3

Volume of water in well / V = Pr x r x h
V = volume in litres
P = 3.14159
r = radius in cm
h = height of water column in cm

Total Well Depth (-) Water level (=) Water Column
_____ m (-) _____ m (=) _____ m

Water Column (x) Conversion Factor (=) Litres per 1 Well Volume
_____ m (x) _____ (=) _____ L

Water Quality Parameters

Beginning purge time: | Ending purge time:

Litres	Time	pH	Temp C	Cond mS/cm	DO ppm	Redox mV	Comments
5		6.90	23.5	31.14	4.43	-45	yellow-brown, slightly
10		6.62	20.6	31.02	3.51	-19.3	cloudy, no odour.
12		6.53	19.67	31.47	9.24	-7.8	
15		6.55	19.19	31.94	10.19	-11	
Stabilisation Criteria		+/- 0.05	+/- 10%	+/- 3%	+/- 10%	+/- 10%	Example Comments: clear / slightly cloudy / turbid / very turbid / no odour / slight odour / odour / strong odour

Total Well Volume
Actual amount of water prior to sampling

*pH, temp, cond readings not necessary if well is purged dry

Did field parameters stabilise? (Y) N NA

Was the well dry purged? Y (N)

Field QC Checks

Was pre-cleaning sampling equipment used for these samples?	(Y)	N		
Was pre-cleaning sampling equipment properly protected from contamination?	(Y)	N		
Was documentation of equipment conducted?	(Y)	N	NA	Dup 1.
Were air bubbles present in vials at time of collection?	Y	(N)	NA	
Was sample for metals field filtered prior to preservations?	(Y)	N	NA	
Duplicate sample collected?	(Y)	N		Duplicate sample ID

TEST PIT LOG

Hole ID. TP01

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**3.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291606**
Drill Method:	**Excavation**	Northing:	**6262339**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.0					Natural	**TOPSOIL** Clayey Silt, dark brown, organics, roots		0.0	TP01 1 / 0.2			
	0.5			CL			**CLAY** brown / orange mottled, charcoal flecks						
	1.0								0.0	TP01 2 / 1.0			
	1.5						**Weathered SANDSTONE** orange / brown, with mottled clay, grey, hard						
	2.0								0.0	TP01 3 / 2.0			
	2.5												
	3.0						**End of Hole at 3.00 m**						
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:13:20 PM

TEST PIT LOG

Hole ID. TP02

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291600**
Drill Method:	**Excavation**	Northing:	**6262269**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5						**TOPSOIL** Clayey Silt, dark brown, organics, roots		0.0	TP02 1 / 0.2			
	1.0			CL		Natural	**CLAY** brown and orange mottled, medium to heavy, charcoal fragments		0.0	TP02 2 / 1.1			
	1.5								0.0	TP02 3 / 1.4			
	2.0						**Weathered SANDSTONE**						
	2.5						**End of Hole at 2.00 m**						
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:13:28 PM

TEST PIT LOG

Hole ID. TP03

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.10 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291604**
Drill Method:	**Excavation**	Northing:	**6262213**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, dark brown, organics, some charcoal deposits		0.0	TP03 - 1 0.2m			
	1.0			CL			**CLAY** yellow / brown, grading to grey (Weathered Sandstone)		0.0	TP03 - 2 0.8m			
	1.5			CL			**CLAY** grey with orange / red mottles, with weathered sandstone fragments						
	2.0								0.0				
							End of Hole at 2.10 m						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:13:34 PM

TEST PIT LOG

Hole ID. TP04

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**3.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291579**
Drill Method:	**Excavation**	Northing:	**6262144**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.0					Natural	**TOPSOIL** Clayey Silt, dark brown		0.0	TP04 - 1 0.2m			
	0.5			CL			**CLAY** yellow / brown, with charcoal fragments, ironstone fragments, calcium carbonate grading to...		0.0	TP04 - 2 1.0m			
	1.5			CL			**Sandy CLAY** orange with red mottling, with ironstone fragments, calcium carbonate, charcoal fragments		0.0	TP04 - 3 2.0m			
	3.0						**End of Hole at 3.00 m**		0.0	TP04 - 4 3.0m			
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

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TEST PIT LOG

Hole ID. **TP05**

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.60 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291576**
Drill Method:	**Excavation**	Northing:	**6262092**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, dark brown, organics		0.0	TP05 - 1 0.2m			
	1.0			CL			**CLAY** yellow / brown, some organics		0.0	TP05 - 2 0.8m			
	1.5			CL			**CLAY** yellow / brown, mottled grey at base		0.0	TP05 - 3 1.2m			
	2.0			CL			**CLAY** grey, orange mottles, medium clay, with ironstone nodules, calcium carbonate, weathered sandstone fragments						
	2.5								0.0	TP05 - 4 2.5m			
							End of Hole at 2.60 m						
	3.0												
	3.5												
	4.0												

Additional Comments	
Abbreviations	D = Dry Dp = Damp SM = Slightly Moist M = Moist VM = Very Moist W = Wet Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:13:49 PM

TEST PIT LOG

Hole ID. TP06

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**3.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291568**
Drill Method:	**Excavation**	Northing:	**6262043**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, dark brown, organics		0.0	TP06 - 1 0.3m	DUP1	TRIP1	
	1.0			CL			**CLAY** yellow / brown						
	1.5								0.0	TP06 - 2 1.5m			
	2.0												
	2.5			CL			**CLAY** orange / brown, grey mottled, ironstone nodules (Weathered Sandstone)		0.0	TP06 - 3 2.7m			
	3.0						**End of Hole at 3.00 m**						
	3.5												
	4.0												

Additional Comments	
Abbreviations	D = Dry Dp = Damp SM = Slightly Moist M = Moist VM = Very Moist W = Wet Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:13:57 PM

TEST PIT LOG

Hole ID. TP07

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.80 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291557**
Drill Method:	**Excavation**	Northing:	**6261991**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, dark brown, organics		0.0	TP07 - 1 0.2m			
	1.0			CL			**CLAY** yellow / brown, with charcoal fragments (?)		0.0	TP07 - 2 1.0m			
	1.5												
	2.0			CL			**CLAY** yellow / brown, mottled grey, ironstone mottles, small gravels, increasingly weathered with depth						
	2.5								0.0	TP07 - 3 2.7m			
	3.0						**End of Hole at 2.80 m**						
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:03 PM

TEST PIT LOG

Hole ID. TP08

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.80 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291659**
Drill Method:	**Excavation**	Northing:	**6261972**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Sandy Clay, grey / brown, hard, black nodules, weathering profile		0.0	TP08 - 1 0.3m			
	1.0			CL			**CLAY** yellow / brown, grey mottling, medium clay, black nodules		0.0	TP08 - 2 1.0m			
	1.5								0.0	TP08 - 3 1.5m			
	2.0			CL			**CLAY** yellow / brown, medium clay, with increased grey mottling, black nodules and weathering						
	2.5								0.0	TP08 - 4 2.7m			
	3.0						**End of Hole at 2.80 m**						
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:11 PM

TEST PIT LOG

Hole ID. **TP09**

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291686**
Drill Method:	**Excavation**	Northing:	**6262066**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, dark brown, organics	M	0.0	TP09 - 1 0.3m			
	1.0			CL			**CLAY** orange / brown mottled, hard, with black nodules (~60%), ironstone fragments, rounded gravels (fluvial?), weathered	M	0.0	TP09 - 2 1.0m			
	1.5								0.0	TP09 - 3 1.7m			
	2.0						**End of Hole at 2.00 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:19 PM

TEST PIT LOG

Hole ID. TP10

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**3.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291704**
Drill Method:	**Excavation**	Northing:	**6262175**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.0					Natural	**TOPSOIL** Clayey Silt, light brown / grey, organics, gravels, black nodules, weathered	D M	0.0	TP10 - 1 0.1m			
	0.5			CL			**CLAY** orange / brown, medium clay, with black nodules, rounded gravels (5-10mmØ)						
	1.0								0.0	TP10 - 2 0.8-1.0m			
	1.5												
	2.0			CL			**Sandy CLAY** orange / brown, mottled grey, medium clay, with rounded gravels (2-5mmØ), ironstone fragments						
	2.5								0.0	TP10 - 3 2.4m			
	3.0								0.0	TP10 - 4 3.0m			
	3.0						**End of Hole at 3.00 m**						
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:26 PM

TEST PIT LOG

Hole ID. TP11

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.20 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291700**
Drill Method:	**Excavation**	Northing:	**6262318**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, brown, organic		0.0	TP11 - 1 0.2m			
	1.0			CL			**CLAY** red / orange, brown mottling, medium clay, hard, ironstone cementing gravels (10-20mmØ)		0.0	TP11 - 2 0.8m			
	1.5						**End of Hole at 1.20 m** Ironstone mottling. Cementing Gravels & Clay.		0.0	TP11 - 3 1.2m			
	2.0												
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:32 PM

TEST PIT LOG

Hole ID. TP12

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.20 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291804**
Drill Method:	**Excavation**	Northing:	**6262310**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, brown / grey, hard, rounded gravels Calcium Carbonate band 0.4 to 0.6m. Discontinuous.	D	0.0	TP12 - 1 0.2m			
	1.0			CL			**CLAY** red / brown, with grey mottles, heavy clay, with ironstone fragments and rounded gravels		0.0	TP12 - 2 0.6-0.8m			
							End of Hole at 1.20 m						
	1.5												
	2.0												
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:34 PM

TEST PIT LOG

Hole ID. TP13

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.50 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291801**
Drill Method:	**Excavation**	Northing:	**6262182**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.0					Fill	**FILL** Clayey Silt, brown, with gravels (roadbase)		0.0	TP13 - 1 0.1m			
				CL			**CLAY** grey, orange mottles, organics, roots						
	0.5								0.0	TP13 - 2 0.5m			
				CL			**CLAY** red / orange / grey mottled, medium clay, with ironstone nodules						
	1.0								0.0	TP13 - 3 1.0m			
						Natural							
	1.5						**CLAY** grey / orange / red, medium to heavy clay, ironstone nodules						
				CL									
	2.0								0.0	TP13 - 4 2.2m			
	2.5						**End of Hole at 2.50 m**						
	3.0												
	3.5												
	4.0												

Additional Comments	**Adjacent to roadway in shade of trees.**
Abbreviations	D = Dry Dp = Damp SM = Slightly Moist M = Moist VM = Very Moist W = Wet Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:36 PM

TEST PIT LOG

Hole ID. TP14

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.50 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291792**
Drill Method:	**Excavation**	Northing:	**6262066**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, dark brown, organics		0.0	TP14 - 1 0.3m			
	1.0			CL			**CLAY** yellow / brown, red mottling, with charcoal fragments		0.0	TP14 - 2 1.1m			
	1.5			CL			**CLAY** grey, red and yellow / brown mottled, medium clay, with ironstone fragments		0.0	TP14 - 3 2.4m			
	2.0						**End of Hole at 2.50 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:39 PM

TEST PIT LOG

Hole ID. TP15

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**15/12/2008**
Project Number:	**1-08-135**	Date Completed:	**15/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.80 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291782**
Drill Method:	**Excavation**	Northing:	**6262018**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, dark brown, organics		0.0	TP15 - 1 0.1m			
	1.0			CL			**CLAY** brown, orange and light grey mottled, with small gravels and charcoal		0.0	TP15 - 2 1.0m			
	1.5												
	2.0								0.0	TP15 - 3 2.0m			
	2.5			CL			**Sandy CLAY** yellow / orange / grey mottled, medium clay, ironstone mottling		0.0	TP15 - 4 2.5m			
	3.0						**End of Hole at 2.80 m**						
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:41 PM

TEST PIT LOG

Hole ID. TP16

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.70 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291768**
Drill Method:	**Excavation**	Northing:	**6261964**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5						**TOPSOIL** Clayey Silty, dark brown, organics		0.0	TP16 - 1 0.2m			
	1.0			CL			**CLAY** yellow / brown mottled, light clay		0.0	TP16 - 2 1.0m			
	1.5					Natural	**CLAY** orange / brown mottled, with grey bands, medium clay, with ironstone fragments						
	2.0			CL					0.0	TP16 - 3 2.3m			
	2.5												
	3.0						**End of Hole at 2.70 m**						
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

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TEST PIT LOG

Hole ID. TP17

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.50 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291888**
Drill Method:	**Excavation**	Northing:	**6262213**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.0					Natural	**TOPSOIL** Clayey Silt, dark brown, organics		0.0	TP17 - 1 0.2m			
	0.5			CL			**CLAY** orange / brown, grey mottles, medium clay						
	1.0								0.0	TP17 - 2 1.0m			
	1.5			CL			**CLAY** yellow / brown with grey mottles, medium clay, sand		0.0	TP17 - 3 1.5m			
	2.0			CL			**CLAY** orange / grey, medium clay, with iron (ferric) cementing						
	2.5						**End of Hole at 2.50 m**						
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:47 PM

TEST PIT LOG

Hole ID. TP18

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.60 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291900**
Drill Method:	**Excavation**	Northing:	**6262098**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.0					Natural	**TOPSOIL** Clayey Silt, dark brown, organics	M	0.0	TP18 - 1 0.2m			
	0.5			CL			**CLAY** orange / brown, red / brown mottles, black mottled (veins?), medium to heavy clay, small gravels		0.0	TP18 - 2 1.2m			
	1.5			CL			**CLAY** yellow / grey mottled, medium clay (sands)		0.0	TP18 - 3 2.2m			
	2.5						**End of Hole at 2.60 m**						
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:49 PM

TEST PIT LOG

Hole ID. TP19

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291874**
Drill Method:	**Excavation**	Northing:	**6262034**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5			CL		Natural	**TOPSOIL** Clayey Silt, dark brown, organic **CLAY** orange / brown, light clay, with small gravels (<5mmØ)		0.0	TP19 - 1 0.3m	DUP2	TRIP2	
	1.0			CL			**CLAY** orange / brown, medium clay, small gravels		0.0	TP19 - 2 1.2m			
	1.5			CL			**CLAY** orange / grey mottled, medium clay, with sands and gravels (<5mmØ)		0.0	TP19 - 3 1.8m			
	2.0						**End of Hole at 2.00 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:52 PM

TEST PIT LOG

Hole ID. TP20

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291829**
Drill Method:	**Excavation**	Northing:	**6261945**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, dark brown, organics		0.0	TP20 - 1 0.3m	DUP3	TRIP3	
	1.0			CL			**CLAY** orange, light clay, gravels (<5mmØ), sands		0.0	TP20 - 2 1.0m			
	1.5			CL			**CLAY** orange / grey mottled (banded), medium clay, with red ironstone mottling, gravels (5-10mm)		0.0	TP20 - 3 1.7m			
	2.0						**End of Hole at 2.00 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:54 PM

TEST PIT LOG

Hole ID. TP21

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291979**
Drill Method:	**Excavation**	Northing:	**6261923**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5			CL		Natural	**CLAY** orange / brown, with dark grey mottles, light clay	M	0.0	TP21 - 1 0.3m			
	1.0			CL			**CLAY** orange, with grey / yellow mottles, light clay		0.0	TP21 - 2 0.8m			
	1.5			CL			**CLAY** orange / grey mottled (banded), light clay, sand, gravels (5-10mmØ), black nodules (10-20mmØ)		0.0	TP21 - 3 1.8m			
	2.0						**End of Hole at 2.00 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:14:57 PM

TEST PIT LOG

Hole ID. TP22

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292007**
Drill Method:	**Excavation**	Northing:	**6261972**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, dark brown		0.0	TP22 - 1 0.3m			
	1.0			CL			**CLAY** brown, with orange mottles, light clay, charcoal fragments in-situ (sample)		0.0	TP22 - 2 1.0m			
	1.5			CL			**CLAY** orange, with grey mottles (banded), ironstone fragments, black nodules. (Weathered Sandstone)		0.0	TP22 - 3 1.8m			
	2.0						**End of Hole at 2.00 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:00 PM

TEST PIT LOG

Hole ID. TP23

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.60 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292039**
Drill Method:	**Excavation**	Northing:	**6262057**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, brown, organics		0.0	TP23 - 1 0.2m			
	1.0			CL			**CLAY** orange, with grey mottles, ironstone fragments, charcoal		0.0	TP23 - 2 1.0m			
	1.5												
							End of Hole at 1.60 m						
	2.0												
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:02 PM

TEST PIT LOG

Hole ID. TP24

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.60 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292017**
Drill Method:	**Excavation**	Northing:	**6262148**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Fill	**FILL** Clayey Silt, brown, rocks (20-50mmØ), gravels (2-5mmØ), organics. Reworked Natural.		0.0	TP24 - 1 0.2m			
	1.0			CL		Natural	**CLAY** orange / brown, black nodules, small gravels		0.0	TP24 - 2 1.2m			
	1.5						**End of Hole at 1.60 m**						
	2.0												
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:05 PM

TEST PIT LOG

Hole ID. TP25

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.20 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292137**
Drill Method:	**Excavation**	Northing:	**6262139**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, brown, organics		0.0	TP25 - 1 0.3m			
	1.0			CL			**CLAY** brown, orange and grey mottled, black nodules, charcoal. Reworked Natural?		0.0	TP25 - 2 1.2m			
	1.5			CL			**CLAY** orange / brown, with grey mottles, gravels (<5mmØ), ironstone fragments, wood / charcoal fragments		0.0	TP25 - 3 2.0m			
	2.0						**End of Hole at 2.20 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments	**Raised ground ~1m above lower ground, ~0.5m above street level.**
Abbreviations	D = Dry Dp = Damp SM = Slightly Moist M = Moist VM = Very Moist W = Wet Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:07 PM

TEST PIT LOG

Hole ID. TP26

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.70 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292085**
Drill Method:	**Excavation**	Northing:	**6262050**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.0					Natural	**TOPSOIL** Silty Clay, dark brown, charcoal (wood)	M	0.0	TP26 - 1 0.2m			
	0.5			CL			**CLAY** orange, with grey mottles, light clay, with gravels, black nodules, ironstone fragments						
	1.0												
	1.5								0.0	TP26 - 2 1.5m			
							End of Hole at 1.70 m						
	2.0												
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:10 PM

TEST PIT LOG

Hole ID. TP27

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.70 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292062**
Drill Method:	**Excavation**	Northing:	**6261994**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty clay, dark brown, gravels, charcoal		0.0	TP27 - 1 0.3m			
	1.0			CL			**CLAY** orange / grey mottled, light clay, with ironstone fragments, black nodules, gravels						
	1.5								0.0	TP27 - 2 1.5m			
	2.0						**End of Hole at 1.70 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:12 PM

TEST PIT LOG

Hole ID. **TP28**

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.80 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292046**
Drill Method:	**Excavation**	Northing:	**6261958**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, dark brown, charcoal, organics		0.0	TP28 - 1 0.3m			
	1.0			CL			**CLAY** orange / grey mottled, light clay, with gravels, charcoal, ironstone fragments, black nodules						
	1.5								0.0	TP28 - 2 1.5m			
	2.0						**End of Hole at 1.80 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments						
Abbreviations	D = Dry	Dp = Damp	SM = Slightly Moist	M = Moist	VM = Very Moist	W = Wet	Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:14 PM

TEST PIT LOG

Hole ID. TP29

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.80 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292011**
Drill Method:	**Excavation**	Northing:	**6261821**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, brown, organics		0.0	TP29 - 1 0.3m			
	1.0			CL			**CLAY** orange / grey mottled, with charcoal, gravel, black nodules						
	1.5								0.0	TP29 - 2 1.5m	DUP4	TRIP4	
	2.0						**End of Hole at 1.80 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:17 PM

TEST PIT LOG

Hole ID. **TP30**

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.90 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291964**
Drill Method:	**Excavation**	Northing:	**6261831**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, dark grey, moist		0.0	TP30 - 1 0.3m			
	1.0			CL			**CLAY** orange / grey mottled						
	1.5						1.5 to 1.7m - Clay, grey, bedded small gravels (2-5mmØ), clast supported, small bands like channel fill		0.0	TP30 - 2 1.5m			
	2.0						**End of Hole at 1.90 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:19 PM

TEST PIT LOG

Hole ID. TP31

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.90 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291969**
Drill Method:	**Excavation**	Northing:	**6261749**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, brown, organics		0.0	TP31 - 1 0.3m			
	1.0			CL			**CLAY** orange, light clay, charcoal (wood)		0.0	TP31 - 2 1.0m			
	1.5			CL			**CLAY** orange / grey mottled, with charcoal, ironstone fragments						
	2.0						**End of Hole at 1.90 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:22 PM

TEST PIT LOG

Hole ID. TP32

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.70 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0291979**
Drill Method:	**Excavation**	Northing:	**6261750**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5			CL		Natural	**TOPSOIL** Silty Clay, brown, organics		0.0	TP32 - 1 0.2m			
	1.0						**CLAY** orange / brown, with grey mottles, light clay, with black nodules, charcoal, ironstone mottling		0.0	TP32 - 2 0.5m			
	1.5								0.0	TP32 - 3 1.5m			
	2.0						**End of Hole at 1.70 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:24 PM

TEST PIT LOG

Hole ID. TP33

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.80 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292041**
Drill Method:	**Excavation**	Northing:	**6261743**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, dark brown, with gravels ~40% (2-5mmØ)	Sd	0.0	TP33 - 1 0.3m			
	1.0			CL			**CLAY** orange, grey mottles, light clay, with charcoal, weathered sandstone fragments, gravels (5-10mmØ)						
	1.5								0.0	TP33 - 2 1.5m			
	2.0						**End of Hole at 1.80 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments						
Abbreviations	D = Dry	Dp = Damp	SM = Slightly Moist	M = Moist	VM = Very Moist	W = Wet	Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:27 PM

TEST PIT LOG

Hole ID. **TP34**

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.80 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292041**
Drill Method:	**Excavation**	Northing:	**6261753**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, dark brown, organics		0.0	TP34 - 1 0.3m			
	1.0			CL			**CLAY** orange, grey mottles, light clay, charcoal						
	1.5								0.0	TP34 - 2 1.5m			
	2.0						**End of Hole at 1.80 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:29 PM

TEST PIT LOG

Hole ID. TP35

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.90 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292054**
Drill Method:	**Excavation**	Northing:	**6261781**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, dark brown, organics		0.0	TP35 - 1 0.3m			
	1.0			CL			**CLAY** orange / brown, light clay, with charcoal, small gravels (5-10mmØ)						
	1.5								0.0	TP35 - 2 1.5m			
	2.0						**End of Hole at 1.90 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:31 PM

TEST PIT LOG

Hole ID. TP36

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.80 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292137**
Drill Method:	**Excavation**	Northing:	**6261919**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5			CL		Natural	**TOPSOIL** Silty Clay, dark brown, organics						
							CLAY orange / brown, light clay, with charcoal, small gravels		0.0	TP36 - 1 0.3m			
	1.0			CL			**CLAY** orange / grey mottled, light clay, red ironstone mottles at base						
	1.5								0.0	TP36 - 2 1.5m			
	2.0						**End of Hole at 1.80 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments						
Abbreviations	D = Dry	Dp = Damp	SM = Slightly Moist	M = Moist	VM = Very Moist	W = Wet	Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:34 PM

TEST PIT LOG

Hole ID. TP37

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.20 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292147**
Drill Method:	**Excavation**	Northing:	**6261996**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, dark brown, plastic at 0.1m.	Sd	0.0	TP37 - 1 0.2m			
	1.0			CL			**CLAY** orange, grey mottles, light clay		0.0	TP37 - 2 1.2m			
							End of Hole at 1.20 m						
	1.5												
	2.0												
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:36 PM

TEST PIT LOG

Hole ID. **TP38**

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.70 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292152**
Drill Method:	**Excavation**	Northing:	**6262089**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Silty Clay, brown, organics		0.0	TP38 - 1 0.3m			
	1.0			CL			**CLAY** orange, medium clay, with sand, gravels, ironstone mottling, black nodules (rock fragments), charcoal (wood)						
	1.5								0.0	TP38 - 2 1.5m			
	2.0						**End of Hole at 1.70 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments	
Abbreviations	D = Dry Dp = Damp SM = Slightly Moist M = Moist VM = Very Moist W = Wet Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:39 PM

TEST PIT LOG

Hole ID. TP39

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**2.00 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292100**
Drill Method:	**Excavation**	Northing:	**6262129**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Fill	**FILL** Clay, brown / orange, red and dark grey mottles, light clay, organics in top 50mm. Reworked Natural.		0.0	TP39 - 1 0.2m	DUP5	TRIP5	
	1.0					Fill	**FILL** Clay, dark grey, with red / orange mottles, plastic sheet		0.0	TP39 - 2 1.1.m			
	1.5			CL		Natural	**CLAY** orange, grey / red mottles, medium clay, with ironstone fragments, calcium carbonate, small gravels (2-5mmØ)		0.0	TP39 - 3 1.7m			
	2.0						**End of Hole at 2.00 m**						
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments

Abbreviations — D = Dry; Dp = Damp; SM = Slightly Moist; M = Moist; VM = Very Moist; W = Wet; Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:42 PM

TEST PIT LOG

Hole ID. **TP40**

WSP Environmental

Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

Project Name:	**UWS Werrington**	Date Started:	**16/12/2008**
Project Number:	**1-08-135**	Date Completed:	**16/12/2008**
Location / Site:	**Werrington**	Hole Depth:	**1.50 m**
Client:		Ground Level:	———
Drilling Company:	**Advanced Plant Hire**	Easting:	**0292184**
Drill Method:	**Excavation**	Northing:	**6261865**
Logged By:	**Anne Ashworth**	Sheet:	**1 of 1**

Method	Depth (m)	RL (m)	Water Level	Classification Symbol	Graphic Log	Material Type	Material Description	Moisture	Sample PID ppm	Sample ID No.	Sample DUP	Sample TRIP	Observations / Comments
Excavation	0.5					Natural	**TOPSOIL** Clayey Silt, dark brown, organics, (fence post metal)		0.0	TP40 - 1 0.3m			
	1.0			CL			**CLAY** orange, with grey / red mottles (ironstone), medium clay, sand, rounded small gravels (10-20mmØ)		0.0	TP40 - 2 1.3m			
	1.5						**End of Hole at 1.50 m**						
	2.0												
	2.5												
	3.0												
	3.5												
	4.0												

Additional Comments	**Adjacent to fence.**
Abbreviations	D = Dry Dp = Damp SM = Slightly Moist M = Moist VM = Very Moist W = Wet Sd = Saturated

REUMAD

Log Drawn By: Laurie White
Contact: laurie.white@reumad.com.au

Checked By: **Anne Ashworth** Date: **9/01/2009**

WSP LOG ALL 1-08-135 UWS WERRINGTON.GPJ WSP LOG.GDT 9/1/09 1:15:44 PM

EXCAVATION LOG LEGEND

WSP Environmental
Level 1, 41 McLaren Street
North Sydney NSW 2060
Office: +61 (0)2 8925 6700
www.wspenvironmental.com

MATERIAL SYMBOL

 FILL	 CONCRETE	 ASPHALT	 TOPSOIL
 ORGANICS	 SANDSTONE	 SHALE	 GRANITE
 ESTUARINE MUD	 PORCELLANITE	 GNEISS	 SHALE / CLAYSTONE
 CLAY	 SAND	 SILT	 GRAVEL
 Sandy CLAY	 Clayey SAND	 Clayey SILT	 Clayey GRAVEL
 Silty CLAY	 Silty SAND	 Sandy SILT	 Sandy GRAVEL
 Gravelly CLAY	 Gravelly SAND	 Gravelly SILT	 Silty GRAVEL
 Sandy Silty CLAY	 Clayey Silty SAND	 Sandy Clayey SILT	 Sandy Clayey GRAVEL
 Silty Sandy CLAY	 Silty Clayey SAND	 Clayey Sandy SILT	 Clayey Sandy GRAVEL
 Sandy Gravelly CLAY	 Clayey Gravelly SAND	 Sandy Gravelly SILT	 Silty Clayey GRAVEL
Silty Gravelly CLAY	Silty Gravelly SAND	Clayey Gravelly SILT	Clayey Silty GRAVEL
Gravelly Silty CLAY	Gravelly Silty SAND	Gravelly Clayey SILT	Sandy Silty GRAVEL
Gravelly Sandy CLAY	Gravelly Clayey SAND	Gravelly Sandy SILT	Silty Sandy GRAVEL

ABBREVIATIONS

PT	Pushtube	HA	Hand Auger
SFA	Solid Flight Auger	HFA	Hollow Flight Auger
PWS	Percussion Window Sampler		

WATER LEVELS

 Encountered Water

 Standing Water

WELL GRAPHICS

Cuttings	Bentonite
Gravel Pack	Screen
Grout	Cave-in

LOG LEGEND - SYDNEY * * 17/10/08 4:17:03 PM

Appendix C Results Tables

Table 1: Soil analysis results, 1-08-135, Summary only

	Asbestos	BTEX	Arsenic	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	PAHs (Sum of total)	Phenolics Total	PCBs (Sum of total)	OCP	OPP	TPH C6 - C9 (Sum of total)	TPH C10 - C36 (Sum of total)
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			1	1	1	1	0.05	1	1							
EPA 1994 Service Station						300				20					65	1000
NEPM 1999 EIL			20		100	600	1	60	200							
NEPM 1999 HIL A			100	12000	1000	300	15	600	7000	20	320	10				

Field_ID	Sample Date															
ASB-1	15/12/2008	Chrysotile, amosite, crocidolite														
MW101/0.3	21/01/2009	nd	nd	5	19	8	10	nd	2	7	nd	nd	nd	nd	nd	nd	nd
MW102/0.3	21/01/2009	nd	4	<0.1	17	5	10	<0.05	2	5	nd	nd	nd	nd	nd	nd	nd
MW102/3	21/01/2009	nd	1	<0.1	2	4	5	<0.05	2	6							
MW103/0.3	21/01/2009	nd	nd	5	17	12	19	nd	5	11	nd	nd	nd	nd	nd	nd	nd
TP01-1	15/12/2008	nd	nd	5	16	14	16	nd	8	16	nd	nd	nd	nd	nd	nd	nd
TP01-2	15/12/2008	nd	nd	5	11	11	8	nd	2	8	nd	nd	nd	nd	nd	nd	nd
TP02-1	15/12/2008	nd	nd	7	16	14	17	nd	6	21	nd	nd	nd	nd	nd	nd	nd
TP03-1	15/12/2008	nd	nd	8	16	17	12	nd	4	15	nd	nd	nd	nd	nd	nd	nd
TP04-1	15/12/2008	nd	nd	9	11	21	31	nd	25	23	nd	nd	nd	nd	nd	nd	nd
TP05-1	15/12/2008	nd	nd	6	10	19	14	nd	12	22	nd	nd	nd	nd	nd	nd	nd
TP06-1	15/12/2008	nd	nd	12	28	28	30	0.06	21	34	nd	nd	nd	nd	nd	nd	nd
TP06-2	15/12/2008	nd	nd	3	11	13	9	nd	8	13	nd	nd	nd	nd	nd	nd	nd
TP07-1	15/12/2008	nd	nd	6	16	10	12	0.05	8	14	nd	nd	nd	nd	nd	nd	nd
TP08-1	15/12/2008	nd	nd	7	19	7	15	0.05	5	9	nd	nd	nd	nd	nd	nd	nd
TP09-1	15/12/2008	nd	nd	5	13	11	14	nd	10	14	nd	nd	nd	nd	nd	nd	nd
TP10-1	15/12/2008	nd	nd	15	40	10	41	nd	13	15	nd	nd	nd	nd	nd	nd	nd
TP10-2	15/12/2008	nd	nd	7	18	13	11	0.08	4	11	nd	nd	nd	nd	nd	nd	nd
TP11-1	15/12/2008	nd	nd	10	25	10	27	nd	5	16	nd	nd	nd	nd	nd	nd	nd
TP12-1	15/12/2008	nd	nd	9	30	15	33	nd	9	18	nd	nd	nd	nd	nd	nd	nd
TP12-2	15/12/2008	nd	nd	3	10	7	8	nd	1	nd	nd	nd	nd	nd	nd	nd	nd
TP13-1	15/12/2008	nd	nd	2	17	9	8	nd	7	18	nd	nd	nd	nd	nd	nd	nd
TP14-1	15/12/2008	nd	nd	9	28	13	22	nd	9	13	nd	nd	nd	nd	nd	nd	nd
TP15-1	15/12/2008	nd	nd	5	13	10	11	nd	3	7	nd	nd	nd	nd	nd	nd	nd
TP16-1	16/12/2008	nd	nd	8	25	12	20	nd	4	9	nd	nd	nd	nd	nd	nd	nd
TP17-1	16/12/2008	nd	nd	7	19	8	18	nd	3	9	nd	nd	nd	nd	nd	nd	nd
TP18-1	16/12/2008	nd	nd	10	16	9	39	nd	8	14	nd	nd	nd	nd	nd	nd	nd
TP19-1	16/12/2008	nd	nd	8	27	7	10	nd	3	12	nd	nd	nd	nd	nd	nd	nd
TP20-1	16/12/2008	nd	nd	8	28	8	11	nd	3	12	nd	nd	nd	nd	nd	nd	nd
TP20-2	16/12/2008	nd	nd	8	22	10	15	nd	12	10	nd	nd	nd	nd	nd	nd	nd
TP21-1	16/12/2008	nd	nd	5	15	7	9	nd	3	6	nd	nd	nd	nd	nd	nd	nd
TP22-1	16/12/2008	nd	nd	20	24	39	21	nd	20	82	nd	nd	nd	nd	nd	nd	nd
TP22-2	16/12/2008	nd	nd	4	10	15	15	nd	15	20	nd	nd	nd	nd	nd	nd	nd
TP23-1	16/12/2008	nd	nd	10	47	6	25	nd	6	10	nd	nd	nd	nd	nd	nd	nd
TP24-1	16/12/2008	nd	nd	6	18	14	13	nd	8	21	nd	nd	nd	nd	nd	nd	nd
TP25-1	16/12/2008	nd	nd	8	28	7	20	nd	4	11	nd	nd	nd	nd	nd	nd	nd
TP25-2	16/12/2008	nd	nd	4	14	9	9	nd	4	10	nd	nd	nd	nd	nd	nd	nd
TP26-1	16/12/2008	nd	nd	5	17	12	25	nd	5	18	nd	nd	nd	nd	nd	nd	nd
TP27-1	16/12/2008	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TP28-1	16/12/2008	nd	nd	7	28	12	16	nd	9	16	nd	nd	nd	nd	nd	nd	nd
TP29-1	16/12/2008	nd	nd	7	28	8	17	nd	6	13	nd	nd	nd	nd	nd	nd	nd
TP30-1	16/12/2008	nd	nd	8	29	9	15	nd	6	11	nd	nd	nd	nd	nd	nd	nd
TP31-1	16/12/2008	nd	nd	12	38	13	27	nd	9	26	nd	nd	nd	nd	nd	nd	nd
TP32-1	16/12/2008	nd	nd	8	26	16	15	nd	12	21	nd	nd	nd	nd	nd	nd	nd
TP32-2	16/12/2008	nd	nd	4	13	14	8	nd	5	16	nd	nd	nd	nd	nd	nd	nd
TP33-1	16/12/2008	nd	nd	8	25	16	15	nd	11	21	nd	nd	nd	nd	nd	nd	nd
TP34-1	16/12/2008	nd	nd	14	26	12	36	nd	12	28	nd	nd	nd	nd	nd	nd	nd
TP35-1	16/12/2008	nd	nd	10	26	11	27	nd	12	19	nd	nd	nd	nd	nd	nd	nd
TP36-1	16/12/2008	nd	nd	4	20	8	15	nd	3	5	nd	nd	nd	nd	nd	nd	nd
TP37-1	16/12/2008	nd	nd	5	27	9	11	0.06	4	5	nd	nd	nd	nd	nd	nd	nd
TP38-1	16/12/2008	nd	nd	3	11	6	16	nd	3	8	nd	nd	nd	nd	nd	nd	nd
TP39-1	16/12/2008	nd	nd	5	14	12	11	nd	7	14	nd	nd	nd	nd	nd	nd	nd
TP39-2	16/12/2008	nd	nd	5	13	15	14	nd	7	19	nd	nd	nd	nd	nd	nd	nd
TP40-1	16/12/2008	nd	nd	4	22	3	21	0.07	2	13	nd	nd	nd	nd	nd	nd	nd
TP40-2	16/12/2008	nd	nd	6	12	10	8	nd	4	17	nd	nd	nd	nd	nd	nd	nd

Statistical Summary

Number of Results	54	53	52	52	52	52	6	52	51	53	53	53	53	53	53	53
Minimum Detect	nd	ND	2	10	3	8	0.05	1	5	ND	ND	ND	ND	ND	ND	ND
Maximum Detect	-	ND	20	47	39	41	0.08	25	82	ND	ND	ND	ND	ND	ND	ND
Average Concentration	-	0	7.1	21	12	17	0.062	7.3	16	0	0	0	0	0	0	0
Standard Deviation	-	0	3.3	8.2	5.8	8.4	0.012	5	11	0	0	0	0	0	0	0
Number of Guideline Exceeda	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 2: Groundwater analysis, 1-08-135, UWS Werrington, January 2009

		BTEX						Chlorinated Hydrocarbons																																	
		Benzene	Ethylbenzene	Toluene	Xylene (m & p)	Xylene (o)	Xylene Total	1,1,1,2-tetrachloroethane	1,1,1-trichloroethane	1,1,2,2-tetrachloroethane	1,1,2-trichloroethane	1,1-dichloroethane	1,1-dichloroethene	1,2,3-trichloropropane	1,2-dichlorobenzene	1,2-dichloroethane	1,3-dichlorobenzene	1,4-dichlorobenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane	Chloroform	cis-1,2-dichloroethene	cis-1,3-dichloropropene	Hexachlorobutadiene	TCE	Tetrachloroethene	trans-1,2-dichloroethene	trans-1,3-dichloropropene	Vinyl chloride	1,2-dibromoethane	Bromodichloromethane	Bromoform	Chlorodibromomethane	Dibromomethane	Trichlorofluoromethane	Arsenic (Filtered)	Cadmium (Filtered)	Chromium (III+VI) (Filtered)	Copper (Filtered)	Lead (Filtered)	Mercury (Filtered)	Nickel (Filtered)	Zinc (Filtered)
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
EQL		1	1	1	2	1		5	5	5	5	5	5	5	5	5	5	5	1	5	50	5	5	5	5	5	5	5	5	50	5	5	5	5	5	50	1	0.1	1	1	1	0.1	1	5
ANZECC 2000 FW 95%		950				350					6500				160		260	60																			13	0.2	1	1.4	3.4	0.6	11	8
Field_ID	**Sample Date**																																										
MW101	30/01/2009	<1	<1	<1	<2	<1	<3 - 0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5	<50	<5	<5	<5	<5	<5	<50	<20	0.4	<5	<10	6	<0.2	<5	33
MW102	30/01/2009	<1	<1	<1	<2	<1	<3 - 0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5	<50	<5	<5	<5	<5	<5	<50	<20	0.4	<5	<10	1	<0.2	<5	48
MW103	30/01/2009	<1	<1	<1	<2	<1	<3 - 0	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<1	<5	<50	<5	<5	<5	<5	<5	<5	<5	<5	<50	<5	<5	<5	<5	<5	<50	<20	0.4	<5	<10	9	<0.2	<5	30
Statistical Summary																																											
Number of Results		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Number of Detects		0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	3	0	0	3
Minimum Detect		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	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	ND	ND	1	ND	ND	30
Maximum Detect		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	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.4	ND	ND	9	ND	ND	48
Average Concentration		0.5	0.5	0.5	1	0.5	0.75	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.5	2.5	25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	25	2.5	2.5	2.5	2.5	2.5	25	10	0.4	2.5	5	5.3	0.1	2.5	37
Median Concentration		0.5	0.5	0.5	1	0.5	0.75	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	0.5	2.5	25	2.5	2.5	2.5	2.5	2.5	2.5	2.5	25	2.5	2.5	2.5	2.5	2.5	25	10	0.4	2.5	5	6	0.1	2.5	33
Standard Deviation		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	9.6

		PAH/Phenols																	TPH					VOC							
		Acenaphthene	Acenaphthylene	Anthracene	Benz(a)anthracene	Benzo(a) pyrene	Benzo(b)&(k)fluoranthene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	PAHs (Sum of total)	Phenanthrene	Phenolics Total	Pyrene	TPH C 6 - C 9 Fraction	TPH C10 - C14 Fraction	TPH C15 - C28 Fraction	TPH C29-C36 Fraction	TPH+C10 - C36 (Sum of total)	1,1-dichloropropene	1,2-dibromo-3-chloropropane	1,2-dichloropropane	1,3-dichloropropane	2,2-dichloropropane	Bromomethane	Chloromethane	Dichlorodifluoromethane
		µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
EQL		1	1	1	1	1	2	1	1	1	1	1	1	1		1	10	1	50	50	200	50		5	5	5	5	5	50	50	50
ANZECC 2000 FW 95%														16																		
Field_ID	**Sample Date**																															
MW101	30/01/2009	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	0	<1	10	<1	<50	<50	<200	<50	300 -	<5	<5	<5	<5	<5	<50	<50	<50
MW102	30/01/2009	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	0	<1	10	<1	<50	<50	<200	<50	300 -	<5	<5	<5	<5	<5	<50	<50	<50
MW103	30/01/2009	<1	<1	<1	<1	<1	<2	<1	<1	<1	<1	<1	<1	<1	0	<1	10	<1	<50	<50	<200	<50	300 -	<5	<5	<5	<5	<5	<50	<50	<50
Statistical Summary																															
Number of Results		3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Number of Detects		0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0
Minimum Detect		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Detect		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration		0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0.5	10	0.5	25	25	100	25	75	2.5	2.5	2.5	2.5	2.5	25	25	25
Median Concentration		0.5	0.5	0.5	0.5	0.5	1	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0	0.5	10	0.5	25	25	100	25	75	2.5	2.5	2.5	2.5	2.5	25	25	25
Standard Deviation		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix D Laboratory Reports

LabMark
ENVIRONMENTAL LABORATORIES

ilac-MRA NATA Accreditation No. 13542

Accredited for compliance with ISO/IEC 17025. The results of tests, calibrations and/or measurements included in this document are traceable to Australian/national standards. NATA is a signatory to the APLAC mutual recognition arrangement for the mutual recognition of the equivalence of testing, calibration and inspection reports.

AQIS
AUSTRALIAN QUARANTINE AND INSPECTION SERVICE
SYDNEY License No. N0356.

Quarantine Approved Premises criteria 5.1 for quarantine containment level 1 (QCI) facilities. Class five criteria cover premises utilised for research, analysis and testing of biological material, soil, animal, plant and human products.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS

FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION

Laboratory Report No:	E041074	Cover Page 1 of 4 plus Sample Results
Client Name:	WSP Environmental Pty Ltd	
Client Reference:	Werrington	
Contact Name:	Anne Ashworth	
Chain of Custody No:	na	Date Received: 18/12/2008
Sample Matrix:	SOIL	Date Reported: 31/12/2008

This Final Certificate of Analysis consists of sample results, DQI's, method descriptions, laboratory definitions, and internationally recognised NATA accreditation and endorsement. The DQO compliance relates specifically to QA/QC results as performed as part of the sample analysis, and may provide an indication of sample result quality. Transfer of report ownership from Labmark to the client shall only occur once full & final payment has been settled and verified. All report copies may be retracted where full payment has not occured within the agreed settlement period.

QUALITY ASSURANCE CRITERIA

Accuracy:	matrix spike:	1 in first 5-20, then 1 every 20 samples
	lcs, crm, method:	1 per analytical batch
	surrogate spike:	addition per target organic method
Precision:	laboratory duplicate:	1 in first 5-10, then 1 every 10 samples
	laboratory triplicate:	re-extracted & reported when duplicate RPD values exceed acceptance criteria
Holding Times:	soils, waters:	Refer to LabMark Preservation & THT table VOC's 14 days water / soil VAC's 7 days water or 14 days acidified VAC's 14 days soil SVOC's 7 days water, 14 days soil Pesticides 7 days water, 14 days soil Metals 6 months general elements Mercury 28 days
Confirmation:	target organic analysis:	GC/MS, or confirmatory column
Sensitivity:	EQL:	Typically 2-5 x Method Detection Limit (MDL)

QUALITY CONTROL GLOBAL ACCEPTANCE CRITERIA (GAC)

Accuracy:	spike, lcs, crm surrogate:	general analytes 70% - 130% recovery phenol analytes 50% - 130% recovery organophosphorous pesticide analytes 60% - 130% recovery phenoxy acid herbicides, organotin 50% - 130% recovery
	anion/cation bal:	+/- 10% (0-3 meq/l), +/- 5% (>3 meq/l)
Precision:	method blank:	not detected >95% of the reported EQL
	duplicate lab RPD (metals):	0-30% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)
	duplicate lab RPD:	0-50% (>10xEQL), 0-75% (5-10xEQL) 0-100% (<5xEQL)

QUALITY CONTROL ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)

Accuracy:	spike, lcs, crm surrogate:	analyte specific recovery data <3xsd of historical mean
Uncertainty:	spike, lcs:	measurement calculated from historical analyte specific control charts

RESULT ANNOTATION

Data Quality Objective	s:	matrix spike recovery	p:	pending	bcs:	batch specific lcs
Data Quality Indicator	d:	laboratory duplicate	lcs:	laboratory control sample	bmb:	batch specific mb
Estimated Quantitation Limit	t:	laboratory triplicate	crm:	certified reference material		
not applicable	r:	RPD relative % difference	mb:	method blank		

[redacted]

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NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.

B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.

C. Laboratory QA/QC samples are specific to this project.

D. Inter-laboratory proficiency results are available upon request. NATA accreditation details available at www.nata.asn.au.

E. VOC spikes & surrogates added to samples during extraction, SVOC spikes & surrogates added prior to extraction.

F. Recovery data outside GAC limits shall be investigated and compared to ASAC (historical mean +/- 3sd). If recovery data <20%, then the relevant results for that compound are considered not reliable.

G. Recovery data (ms, surrogate, crm, lcs) outside ASAC limits shall initiate an investigative action. Anomolous QC data is examined in conjunction with other QC samples and a final decision whether to accept or reject results is provided by the professional judgement of the senior analyst. The USEPA-CLP National Functional Guidelines are referred to for specific recommendations.

H. Extraction (preparation) date refers to the date that sample preparation was initiated. Note that certain methods not requiring sample preparation (eg. VOCs in water, etc) may report a common extraction and analysis date.

I. LabMark shall maintain an official copy of this Certificate of Analysis for all tracable reference purposes.

2. CHAIN OF CUSTODY (COC) & SAMPLE RECEIPT NOTICE (SRN) REQUIREMENTS

A. SRN issued to client upon sample receipt & login verification.

B. Preservation & sampling date details specified on COC and SRN, unless noted.

C. Sample Integrity & Validated Time of Sample Receipt (VTSR) Holding Times verified (preservation may extend holding time, refer to preservation chart).

3. NATA ACCREDITED METHODS

A. NATA accreditation held for each in-house method and sample matrix type reported, unless noted below (Refer to subcontracted test reports for NATA accreditation status).

B. NATA accredited in-house laboratory methods are referenced from NEPC, ASTM, modified USEPA / APHA documents. Corporate Accreditation No. 13542.

C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.
Reported by Amdel Limited, NATA accreditation No.1526.

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4. QA/QC FREQUENCY COMPLIANCE TABLE SPECIFIC TO THIS REPORT

Matrix: **SOIL**

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	BTEX by P&T	52	6	12%	0	3	6%
1	Volatile TPH by P&T (vTPH)	52	6	12%	0	3	6%
8	Petroleum Hydrocarbons (TPH)	52	6	12%	0	3	6%
15	Polyaromatic Hydrocarbons (PAH)	52	6	12%	0	3	6%
22	Phenols by GC/MS	52	6	12%	0	3	6%
29	Organochlorine Pesticides (OC)	52	6	12%	0	3	6%
36	Organophosphorus Pesticides (OP)	52	6	12%	0	3	6%
43	Polychlorinated Biphenyls (PCB)	52	6	12%	0	3	6%
50	Acid extractable metals (M7)	52	6	12%	3	3	6%
58	Acid extractable metals - mercury	52	6	12%	0	3	6%
62	Moisture	52	--	--	--	--	--

GLOSSARY:

#d	number of discrete duplicate extractions/analyses performed.
%d-ratio	NEPC guideline for laboratory duplicates is 1 in 10 samples (min 10%).
#t	number of triplicate extractions/analyses performed.
#s	number of spiked samples analysed.
%s-ratio	USEPA guideline for laboratory matrix spikes is 1 in 20 samples (min 5%).

Environmental Laboratory Industry Group
Foundation Member

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5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, Corporate Site No. 13535, unless indicated below.
B. Spike recoveries for chromium and zinc in sample 190851s at 59% and 64%, corresponding lcs recoveries at 86% and 94% respectively.
C. Spike recoveries for arsenic, chromium, nickel and lead in sample 190871s at 59%, 160%, 56% and 63%, corresponding lcs recoveries at 90%, 86%, 90% and 92% respectively.
D. Lab #190850d reported RPD of 40% for lead, triplicate result issued.
E. Lab #190860d reported RPD of 31% for chromium, triplicate result issued.
F. Lab #190870d reported RPD of 54% for chromium, triplicate result issued.
G. Spike recoveries for chromium and copper in sample 190896s at 63% and 68%, corresponding lcs recoveries at 86% and 92% respectively.

Laboratory QA/QC data shall relate specifically to this report, and may provide an indication of site specific sample result quality. LabMark DOES NOT report NON-RELEVANT BATCH QA/QC data. Acceptance of this self assessment certificate does not preclude any requirement for a QA/QC review by a accredited contaminated site EPA auditor, when and wherever necessary. Laboratory QA/QC self assessment references available upon request.

LabMark
ENVIRONMENTAL LABORATORIES

Laboratory Report No: E041074
Client Name: WSP Environmental Pty Ltd
Contact Name: Anne Ashworth
Client Reference: Werrington 1-08-135

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plus cover page
Date: 31/12/08
This report supercedes reports issued on: N/A

Final
Certificate
of Analysis

Laboratory Identification		**190850**	**190851**	**190852**	**190853**	**190854**	**190855**	**190856**	**190857**	**190858**	**190859**
Sample Identification		TP01-1	TP02-1	TP03-1	TP04-1	TP05-1	TP06-1	TP07-1	TP08-1	TP09-1	TP10-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
meta- and para-Xylene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ortho-Xylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	*93%*	*91%*	*93%*	*91%*	*96%*	*90%*	*94%*	*95%*	*96%*	*91%*
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Identification		**190860**	**190861**	**190862**	**190863**	**190864**	**190865**	**190866**	**190867**	**190868**	**190869**
Sample Identification		TP11-1	TP12-1	TP13-1	TP14-1	TP15-1	TP16-1	TP17-1	TP18-1	TP19-1	TP20-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
meta- and para-Xylene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ortho-Xylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	*91%*	*97%*	*93%*	*91%*	*94%*	*73%*	*90%*	*90%*	*92%*	*91%*
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Identification		**190870**	**190871**	**190872**	**190873**	**190874**	**190875**	**190876**	**190877**	**190878**	**190879**
Sample Identification		TP21-1	TP22-1	TP23-1	TP24-1	TP25-1	TP26-1	TP27-1	TP28-1	TP29-1	TP30-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
meta- and para-Xylene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ortho-Xylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	*91%*	*94%*	*92%*	*96%*	*94%*	*88%*	*99%*	*97%*	*96%*	*94%*
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Identification		**190880**	**190881**	**190882**	**190883**	**190884**	**190885**	**190886**	**190887**	**190888**	**190889**
Sample Identification		TP31-1	TP32-1	TP33-1	TP34-1	TP35-1	TP36-1	TP37-1	TP38-1	TP39-1	TP40-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
meta- and para-Xylene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ortho-Xylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	*96%*	*94%*	*94%*	*92%*	*86%*	*94%*	*97%*	*91%*	*89%*	*93%*
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Identification		**190890**	**190891**	**190894**	**190895**	**190896**	**190897**	**190898**	**190899**	**190900**	**190901**
Sample Identification		DUP1	DUP2	TP01-2	TP06-2	TP10-2	TP12-2	TP20-2	TP22-2	TP25-2	TP32-2
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	16/12/08	15/12/08	15/12/08	15/12/08	15/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	26/12/08	26/12/08
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
meta- and para-Xylene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
ortho-Xylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	*92%*	*93%*	*93%*	*88%*	*92%*	*95%*	*94%*	*93%*	*95%*	*93%*
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Identification		**190902**	**190903**	**190850d**	**190850r**	**190860d**	**190860r**	**190870d**	**190870r**	**190880d**	**190880r**
Sample Identification		TP39-2	TP40-2	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		16/12/08	16/12/08	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	--	23/12/08	--	23/12/08	--	23/12/08	--
Laboratory Analysis Date		26/12/08	26/12/08	25/12/08	--	25/12/08	--	25/12/08	--	25/12/08	--
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	<0.2	<0.2	--	<0.2	--	<0.2	--	<0.2	--
Toluene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Ethylbenzene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
meta- and para-Xylene	1	<1	<1	<1	--	<1	--	<1	--	<1	--
ortho-Xylene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Total Xylene	--	--	--	--	--	--	--	--	--	--	--
CDFB (Surr @ 10mg/kg)	--	*96%*	*94%*	*95%*	*2%*	*93%*	*2%*	*95%*	*4%*	*98%*	*2%*
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	<10	<10	--	<10	--	<10	--	<10	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Identification		190895d	190895r	190903d	190903r	190851s	190871s	190896s	lcs	mb	
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	
Depth (m)		--	--	--	--	--	--	--	--	--	
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	
Laboratory Extraction (Preparation) Date		23/12/08	--	23/12/08	--	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	
Laboratory Analysis Date		25/12/08	--	26/12/08	--	25/12/08	25/12/08	25/12/08	23/12/08	23/12/08	
Method : E002.2											
BTEX by P&T	**EQL**										
Benzene	0.2	<0.2	--	<0.2	--	99%	94%	94%	97%	<0.2	
Toluene	0.5	<0.5	--	<0.5	--	102%	97%	98%	98%	<0.5	
Ethylbenzene	0.5	<0.5	--	<0.5	--	95%	92%	93%	97%	<0.5	
meta- and para-Xylene	1	<1	--	<1	--	98%	94%	96%	100%	<1	
ortho-Xylene	0.5	<0.5	--	<0.5	--	99%	95%	97%	100%	<0.5	
Total Xylene	--	--	--	--	--	--	--	--	--	--	
CDFB (Surr @ 10mg/kg)	--	*93%*	*6%*	*94%*	*0%*	*95%*	*93%*	*93%*	*71%*	*80%*	
Method : E003.2											
Volatile TPH by P&T (vTPH)	**EQL**										
C6 - C9 Fraction	10	<10	--	<10	--	90%	83%	89%	95%	<10	

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E003.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID.
E002.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/PID/MSD.

Laboratory Identification		**190850**	**190851**	**190852**	**190853**	**190854**	**190855**	**190856**	**190857**	**190858**	**190859**
Sample Identification		TP01-1	TP02-1	TP03-1	TP04-1	TP05-1	TP06-1	TP07-1	TP08-1	TP09-1	TP10-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Sum of TPH C10 - C36	--	--	--	--	--	--	--	--	--	--	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Identification		**190860**	**190861**	**190862**	**190863**	**190864**	**190865**	**190866**	**190867**	**190868**	**190869**
Sample Identification		TP11-1	TP12-1	TP13-1	TP14-1	TP15-1	TP16-1	TP17-1	TP18-1	TP19-1	TP20-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Sum of TPH C10 - C36	--	--	--	--	--	--	--	--	--	--	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Identification		**190870**	**190871**	**190872**	**190873**	**190874**	**190875**	**190876**	**190877**	**190878**	**190879**
Sample Identification		TP21-1	TP22-1	TP23-1	TP24-1	TP25-1	TP26-1	TP27-1	TP28-1	TP29-1	TP30-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Sum of TPH C10 - C36	--	--	--	--	--	--	--	--	--	--	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Identification		**190880**	**190881**	**190882**	**190883**	**190884**	**190885**	**190886**	**190887**	**190888**	**190889**
Sample Identification		TP31-1	TP32-1	TP33-1	TP34-1	TP35-1	TP36-1	TP37-1	TP38-1	TP39-1	TP40-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Sum of TPH C10 - C36	--	--	--	--	--	--	--	--	--	--	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Identification		**190890**	**190891**	**190894**	**190895**	**190896**	**190897**	**190898**	**190899**	**190900**	**190901**
Sample Identification		DUP1	DUP2	TP01-2	TP06-2	TP10-2	TP12-2	TP20-2	TP22-2	TP25-2	TP32-2
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	16/12/08	15/12/08	15/12/08	15/12/08	15/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	24/12/08
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100
Sum of TPH C10 - C36	--	--	--	--	--	--	--	--	--	--	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Identification		190902	190903	190850d	190850r	190860d	190860r	190870d	190870r	190880d	190880r
Sample Identification		TP39-2	TP40-2	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		16/12/08	16/12/08	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	--	23/12/08	--	23/12/08	--	23/12/08	--
Laboratory Analysis Date		24/12/08	24/12/08	24/12/08	--	24/12/08	--	24/12/08	--	24/12/08	--
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	<50	<50	--	<50	--	<50	--	<50	--
C15 - C28 Fraction	100	<100	<100	<100	--	<100	--	<100	--	<100	--
C29 - C36 Fraction	100	<100	<100	<100	--	<100	--	<100	--	<100	--
Sum of TPH C10 - C36	--	--	--	--	--	--	--	--	--	--	--

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Identification		**190895d**	**190895r**	**190903d**	**190903r**	**190851s**	**190871s**	**190896s**	**lcs**	**mb**	
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	
Depth (m)		--	--	--	--	--	--	--	--	--	
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	
Laboratory Extraction (Preparation) Date		23/12/08	--	23/12/08	--	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	
Laboratory Analysis Date		24/12/08	--	24/12/08	--	24/12/08	24/12/08	24/12/08	23/12/08	23/12/08	
Method : E006.2											
Petroleum Hydrocarbons (TPH)	**EQL**										
C10 - C14 Fraction	50	<50	--	<50	--	72%	70%	71%	75%	<50	
C15 - C28 Fraction	100	<100	--	<100	--	--	--	--	--	<100	
C29 - C36 Fraction	100	<100	--	<100	--	--	--	--	--	<100	
Sum of TPH C10 - C36	--	--	--	--	--	--	--	--	--	--	

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E006.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/FID.

Laboratory Identification		**190850**	**190851**	**190852**	**190853**	**190854**	**190855**	**190856**	**190857**	**190858**	**190859**
Sample Identification		TP01-1	TP02-1	TP03-1	TP04-1	TP05-1	TP06-1	TP07-1	TP08-1	TP09-1	TP10-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(a) pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of reported PAHs	--	--	--	--	--	--	--	--	--	--	--
2-FBP (Surr @ 5mg/kg)	--	*87%*	*86%*	*90%*	*99%*	*102%*	*93%*	*96%*	*85%*	*87%*	*104%*
TP-d14 (Surr @ 5mg/kg)	--	*90%*	*89%*	*96%*	*105%*	*102%*	*97%*	*97%*	*86%*	*95%*	*102%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Identification		**190860**	**190861**	**190862**	**190863**	**190864**	**190865**	**190866**	**190867**	**190868**	**190869**
Sample Identification		TP11-1	TP12-1	TP13-1	TP14-1	TP15-1	TP16-1	TP17-1	TP18-1	TP19-1	TP20-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(a) pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of reported PAHs	--	--	--	--	--	--	--	--	--	--	--
2-FBP (Surr @ 5mg/kg)	--	*86%*	*91%*	*87%*	*97%*	*90%*	*112%*	*106%*	*90%*	*83%*	*98%*
TP-d14 (Surr @ 5mg/kg)	--	*84%*	*90%*	*81%*	*94%*	*88%*	*125%*	*108%*	*83%*	*80%*	*101%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Identification		**190870**	**190871**	**190872**	**190873**	**190874**	**190875**	**190876**	**190877**	**190878**	**190879**
Sample Identification		TP21-1	TP22-1	TP23-1	TP24-1	TP25-1	TP26-1	TP27-1	TP28-1	TP29-1	TP30-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(a) pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of reported PAHs	--	--	--	--	--	--	--	--	--	--	--
2-FBP (Surr @ 5mg/kg)	--	*105%*	*104%*	*81%*	*116%*	*87%*	*122%*	*95%*	*103%*	*95%*	*110%*
TP-d14 (Surr @ 5mg/kg)	--	*103%*	*106%*	*82%*	*117%*	*88%*	*112%*	*105%*	*106%*	*91%*	*112%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Identification		**190880**	**190881**	**190882**	**190883**	**190884**	**190885**	**190886**	**190887**	**190888**	**190889**
Sample Identification		TP31-1	TP32-1	TP33-1	TP34-1	TP35-1	TP36-1	TP37-1	TP38-1	TP39-1	TP40-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(a) pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of reported PAHs	--	--	--	--	--	--	--	--	--	--	--
2-FBP (Surr @ 5mg/kg)	--	*100%*	*97%*	*103%*	*123%*	*85%*	*94%*	*85%*	*105%*	*94%*	*111%*
TP-d14 (Surr @ 5mg/kg)	--	*101%*	*100%*	*102%*	*122%*	*89%*	*95%*	*87%*	*111%*	*94%*	*116%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Identification		**190890**	**190891**	**190894**	**190895**	**190896**	**190897**	**190898**	**190899**	**190900**	**190901**
Sample Identification		DUP1	DUP2	TP01-2	TP06-2	TP10-2	TP12-2	TP20-2	TP22-2	TP25-2	TP32-2
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	16/12/08	15/12/08	15/12/08	15/12/08	15/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Acenaphthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluorene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Phenanthrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoranthene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benz(a)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chrysene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(b)&(k)fluoranthene	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Benzo(a) pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-c,d)pyrene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Dibenz(a,h)anthracene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(g,h,i)perylene	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sum of reported PAHs	--	--	--	--	--	--	--	--	--	--	--
2-FBP (Surr @ 5mg/kg)	--	*96%*	*92%*	*112%*	*98%*	*105%*	*109%*	*97%*	*92%*	*99%*	*103%*
TP-d14 (Surr @ 5mg/kg)	--	*95%*	*97%*	*112%*	*104%*	*108%*	*102%*	*95%*	*93%*	*101%*	*104%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Identification		**190902**	**190903**	**190850d**	**190850r**	**190860d**	**190860r**	**190870d**	**190870r**	**190880d**	**190880r**
Sample Identification		TP39-2	TP40-2	QC	QC	QC	QC	QC	QC	QC	QC
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		16/12/08	16/12/08	--	--	--	--	--	--	--	--
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	--	23/12/08	--	23/12/08	--	23/12/08	--
Laboratory Analysis Date		25/12/08	25/12/08	24/12/08	--	25/12/08	--	25/12/08	--	25/12/08	--
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Acenaphthylene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Acenaphthene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Fluorene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Phenanthrene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Anthracene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Fluoranthene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	1	>67%
Pyrene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	0.8	>46%
Benz(a)anthracene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	0.5	>0%
Chrysene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	0.5	>0%
Benzo(b)&(k)fluoranthene	1	<1	<1	<1	--	<1	--	<1	--	<1	--
Benzo(a) pyrene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	0.5	>0%
Indeno(1,2,3-c,d)pyrene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Dibenz(a,h)anthracene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Benzo(g,h,i)perylene	0.5	<0.5	<0.5	<0.5	--	<0.5	--	<0.5	--	<0.5	--
Sum of reported PAHs	--	--	--	--	--	--	--	--	--	3.3	--
2-FBP (Surr @ 5mg/kg)	--	*101%*	*91%*	*93%*	*7%*	*84%*	*2%*	*88%*	*18%*	*100%*	*0%*
TP-d14 (Surr @ 5mg/kg)	--	*101%*	*98%*	*96%*	*6%*	*85%*	*1%*	*93%*	*10%*	*101%*	*0%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Identification		190895d	190895r	190903d	190903r	190851s	190871s	190896s	lcs	mb	
Sample Identification		QC	QC	QC	QC	QC	QC	QC	QC	QC	
Depth (m)		--	--	--	--	--	--	--	--	--	
Sampling Date recorded on COC		--	--	--	--	--	--	--	--	--	
Laboratory Extraction (Preparation) Date		23/12/08	--	23/12/08	--	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	
Laboratory Analysis Date		25/12/08	--	25/12/08	--	24/12/08	25/12/08	25/12/08	23/12/08	23/12/08	
Method : E007.2											
Polyaromatic Hydrocarbons (PAH)	**EQL**										
Naphthalene	0.5	<0.5	--	<0.5	--	93%	111%	103%	92%	<0.5	
Acenaphthylene	0.5	<0.5	--	<0.5	--	89%	108%	97%	91%	<0.5	
Acenaphthene	0.5	<0.5	--	<0.5	--	95%	107%	100%	94%	<0.5	
Fluorene	0.5	<0.5	--	<0.5	--	85%	104%	94%	99%	<0.5	
Phenanthrene	0.5	<0.5	--	<0.5	--	95%	122%	110%	100%	<0.5	
Anthracene	0.5	<0.5	--	<0.5	--	90%	114%	109%	103%	<0.5	
Fluoranthene	0.5	<0.5	--	<0.5	--	92%	110%	103%	101%	<0.5	
Pyrene	0.5	<0.5	--	<0.5	--	85%	109%	99%	98%	<0.5	
Benz(a)anthracene	0.5	<0.5	--	<0.5	--	89%	111%	101%	105%	<0.5	
Chrysene	0.5	<0.5	--	<0.5	--	100%	124%	109%	106%	<0.5	
Benzo(b)&(k)fluoranthene	1	<1	--	<1	--	99%	122%	108%	104%	<1	
Benzo(a) pyrene	0.5	<0.5	--	<0.5	--	96%	119%	108%	104%	<0.5	
Indeno(1,2,3-c,d)pyrene	0.5	<0.5	--	<0.5	--	83%	111%	101%	97%	<0.5	
Dibenz(a,h)anthracene	0.5	<0.5	--	<0.5	--	89%	120%	106%	104%	<0.5	
Benzo(g,h,i)perylene	0.5	<0.5	--	<0.5	--	80%	109%	99%	98%	<0.5	
Sum of reported PAHs	--	--	--	--	--	--	--	--	--	--	
2-FBP (Surr @ 5mg/kg)	--	*105%*	*7%*	*97%*	*6%*	*95%*	*108%*	*90%*	*90%*	*103%*	
TP-d14 (Surr @ 5mg/kg)	--	*105%*	*1%*	*100%*	*2%*	*92%*	*108%*	*94%*	*105%*	*119%*	

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E007.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Identification		**190850**	**190851**	**190852**	**190853**	**190854**	**190855**	**190856**	**190857**	**190858**	**190859**
Sample Identification		TP01-1	TP02-1	TP03-1	TP04-1	TP05-1	TP06-1	TP07-1	TP08-1	TP09-1	TP10-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	15/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		24/12/08	24/12/08	24/12/08	24/12/08	24/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E008.2											
Phenols by GC/MS	**EQL**										
Phenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-methylphenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3-&4-methylphenol	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-nitrophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-chloro-3-methylphenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-trichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sum of reported phenols	--	--	--	--	--	--	--	--	--	--	--
2-FP (Surr @ 5mg/kg)	--	*86%*	*82%*	*89%*	*91%*	*85%*	*83%*	*93%*	*86%*	*85%*	*89%*
Phenol-d5 (Surr @ 5mg/kg)	--	*78%*	*77%*	*81%*	*85%*	*81%*	*83%*	*78%*	*72%*	*80%*	*83%*
2,4,6-TBP (Surr @ 5mg/kg)	--	*101%*	*120%*	*100%*	*119%*	*90%*	*98%*	*86%*	*78%*	*90%*	*97%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E008.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.

Laboratory Identification		**190860**	**190861**	**190862**	**190863**	**190864**	**190865**	**190866**	**190867**	**190868**	**190869**
Sample Identification		TP11-1	TP12-1	TP13-1	TP14-1	TP15-1	TP16-1	TP17-1	TP18-1	TP19-1	TP20-1
Depth (m)		--	--	--	--	--	--	--	--	--	--
Sampling Date recorded on COC		15/12/08	15/12/08	15/12/08	15/12/08	15/12/08	16/12/08	16/12/08	16/12/08	16/12/08	16/12/08
Laboratory Extraction (Preparation) Date		23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08	23/12/08
Laboratory Analysis Date		25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08	25/12/08
Method : E008.2											
Phenols by GC/MS	**EQL**										
Phenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-chlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2-methylphenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
3-&4-methylphenol	1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
2-nitrophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dimethylphenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
4-chloro-3-methylphenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,6-trichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
2,4,5-trichlorophenol	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Pentachlorophenol	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Sum of reported phenols	--	--	--	--	--	--	--	--	--	--	--
2-FP (Surr @ 5mg/kg)	--	*82%*	*82%*	*81%*	*91%*	*83%*	*113%*	*98%*	*78%*	*77%*	*86%*
Phenol-d5 (Surr @ 5mg/kg)	--	*73%*	*80%*	*81%*	*82%*	*79%*	*105%*	*81%*	*74%*	*72%*	*78%*
2,4,6-TBP (Surr @ 5mg/kg)	--	*90%*	*94%*	*87%*	*82%*	*87%*	*96%*	*102%*	*82%*	*76%*	*83%*

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E008.2: 8-10g soil extracted with 20ml DCM/Acetone/Hexane (10:45:45). Analysis by GC/MS.