



Douglas Partners
Geotechnics | Environment | Groundwater

Report on
Preliminary Contamination, Salinity and Acid Sulphate
Soil Assessment

Proposed Stables Precinct
Royal Randwick Racecourse, Randwick

Prepared for
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Executive Summary

This report details the methodology and results of a preliminary contamination, salinity and acid sulphate soil assessment undertaken by Douglas Partners Pty Ltd (DP) at an area identified as the proposed Stables Precinct (the site) located at the Royal Randwick Racecourse. The current assessment was commissioned by the Australian Jockey Club (AJC). This report will be used as part of a submission relating to the Director-General Environment Assessment Requirements (DGR) for the proposed stables development.

The objective of the current assessment was to provide preliminary data on the contamination status and the presence/absence of acid sulphate soils (ASS) and saline soils at the proposed Stables Precinct. The assessment comprised a review of previous assessments undertaken at the overall Royal Randwick Racecourse (RRR), a site history review and intrusive soil investigations (from ten sampling locations) and groundwater investigations (from one groundwater monitoring well) at the site.

The site history and the field observations suggest that with the exception of the quality of fill placed on the site, the site has a relatively low potential for contamination.

The analytical results for the groundwater samples indicated that concentration of heavy metals, TPH/BTEX, PAH, OCP/PCB/OPP and phenols was generally low and within the adopted GIL. Further, the results of the assessment also showed that acid sulphate soils and saline soils are not present within the proposed development area.

The analytical results for the soil samples showed that concentration of TPH/BTEX, OCPs/PCBs/OPPs and phenols was generally low and within the adopted SAC for a commercial/industrial landuse. Whilst marginal exceedances of lead, B(a)P and total PAHs were detected in some samples, the results of the calculated 95% UCL showed that the concentration of these contaminants was below the adopted SAC.

However, asbestos (chrysotile, amosite and crocidolite) was detected in one sample viz., TP110/1.5-2.0 which was collected from TP110 at a nominal depth of 1.5 - 2.0 m bgl. The fill in this test pit which was relatively distinct to the far south-western portion of the site comprised dark brown silty sand with some shale boulders and traces of construction debris such as metal scraps, concrete boulders and PVC up to a nominal depth of 2.2 m bgl suggesting the use of uncontrolled fill in the area. Therefore, based on the analytical results and the field observations, the fill profile in the vicinity of TP110 is considered to be contaminated with asbestos. As the current assessment was preliminary in nature, it is recommended that step-out sampling at TP110 should be carried out with the objective of delineating the extent of asbestos contamination.

On the basis of the investigation findings, the site can be rendered suitable for the proposed commercial landuse subject to the remediation of the asbestos contaminated soil in the vicinity of TP110.

The results of the provisional *in situ* waste classification assessment showed that the filling is provisionally classified as GENERAL SOLID WASTE (NON PUTRESCIBLE) except in the vicinity of TP110 which is provisionally classified as SPECIAL WASTE (ASBESTOS WASTE). Both wastes should be disposed of to a landfill that is licensed to receive such waste.

Further, during earthworks, if any additional asbestos contamination is found, then the material must be segregated from the general spoil, to be further assessed/waste classified. All asbestos contaminated waste must be classified and disposed of as Special Waste (Asbestos Waste) to a suitably licensed landfill.

The natural grey/yellow/white sands in the test bore logs is considered to be Virgin Excavated Natural material (VENM), on the proviso that the natural, *in situ* soil does not contain discernible signs of contamination and is not cross-contaminated with any non-VENM material.

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Report on Preliminary Contamination, Salinity and Acid Sulphate Soil Assessment

Proposed Stables Precinct

Royal Randwick Racecourse, Randwick

1. Introduction

This report details the methodology and results of a preliminary contamination, salinity and acid sulphate soil assessment undertaken by Douglas Partners Pty Ltd (DP) at an area identified as the proposed Stables Precinct (the site) located at the Royal Randwick Racecourse. A site plan showing the location of the site is provided in Drawing 1, Appendix A. The current assessment was commissioned by the Australian Jockey Club (AJC). This report will be used as part of a submission relating to the Director-General Environment Assessment Requirements (DGR) for the proposed stables development.

The aim of the investigation was to:

- provide preliminary data on the contamination status of the subsoils present in the Stables Precinct;
- provide preliminary data on the salinity of the sub soils and, as appropriate, provide recommendations for salinity management techniques; and
- provide preliminary data on the presence/absence of acid sulphate soils (ASS) and, as appropriate, provide recommendations for acid sulphate soil management techniques.

The site, which is located within the boundaries of the Royal Randwick Racecourse (RRR), is an irregular shaped land parcel that is currently occupied by dilapidated stables and a training track. The investigation included a review of available site history, the excavation of eight test pits, drilling of two test bores, collection of soil and groundwater samples and analysis of the samples for various contamination, salinity and acid sulphate soil parameters. The details of the fieldwork are presented in this report, together with comments and recommendations on the issues listed above.

1.1 Proposed Development

Based on the information provided by the client, it is understood that the proposed Stables Precinct development will consolidate the existing on-site and off-site Royal Randwick Racecourse stabling facilities into a single location. It is expected to include:

- Demolition of the existing stripping Stalls, sand rolls, farrier's workshop, administration hut and stewards' office;
- Construction of six, two storey stable buildings, generally containing 100 stables, two sand rolls, four wash bays, a Trainer's office, store rooms, and stable hand / caretaker accommodation in each block and a mezzanine level of strapper/stable-hand accommodation with eight single bedrooms and share kitchen;

- Construction of 12 two storey mechanical Horse Walkers, a 'Bull Ring', two Parade Rings and an equine pool;
- Construction of a new Equine Tunnel to connect the Stables Precinct to the track infield;
- Landscaping of the area, including car parking;
- Associated services infrastructure upgrades, civil and landscape works;
- Single storey tie-up stalls building with 50 stalls; and
- Single storey pony enclosure for up to 25 ponies.

2. Scope of Works

The assessment has been developed broadly in accordance with the seven step data quality objective process, as defined in Australian Standard (AS) *Guide to the Sampling and Investigation of Potentially Contaminated Soil Part 1: Non-volatile and Semi-volatile Compounds* (AS 4482.1 – 2005). The DQO process is outlined in the AS and defined by:

- Stating the Problem;
- Identifying the Decision;
- Identifying Inputs to the Decision;
- Defining the Boundary of the Assessment;
- Developing a Decision Rule;
- Specifying Acceptable Limits on Decision Errors;
- Optimising the Design for Obtaining Data.

Data quality objectives have been established for the project and are summarised in Table 1 and discussed in detail in Section 9.

Table 1: Data Quality Objectives

Data Quality Objective	Report Section Where Addressed
State the Problem	S1 Introduction
Identify the Decision	S9 Site Assessment Criteria S13 Discussion S14 Conclusions
Identify Inputs to the Decision	S3 Background and Previous Reports S4 Site Description S5 Geology and Hydrogeology S7 Potential For Contamination S9 Site Assessment Criteria S11 Field Results S12 Laboratory Testing
Define the Boundary of the Assessment	S4 Site Description
Develop a Decision Rule	S9 Site Assessment Criteria
Specify Acceptable Limits on Decision Errors	Appendix D
Optimise the Design for Obtaining Data.	S8 Fieldwork Methods

The scope of works for the assessment was based on our proposal dated 20 July, 2010, and revisions dated 13 August, 2010 which were accepted by the AJC.

The scope of works for contamination component of the assessment was as follows:

Desktop Component

- Review readily available site history information available for the site including previous environmental studies, historical title deeds, Council records, 149(2) certificates, WorkCover records, historical aerial photographs, groundwater bore records;
- Review published geological, soil, salinity and acid sulphate soil maps to determine the likely soil conditions at the site.
- Conduct a site inspection to identify areas of environmental concern (AEC);

Field Component

- Excavation of a total of eight test pits (TP103 and TP110) using a backhoe and drilling of two test bores (BH5 and BH6) using a bobcat-mounted drill rig. Test pits were extended to a depth of 0.5 m into natural material (nominally 3 to 4 m) or prior refusal. The test bores were extended to a depth of 0.5 m into natural material (nominally 3 to 4 m) or prior refusal.

- b. One of the two above-mentioned test bores (BH5) was extended to a nominal depth of 6.0 m below ground level (bgl) with a view to intercepting the groundwater table, installation of a groundwater monitoring well and to evaluate the presence/absence of acid sulphate and saline soils.

Underground service scanning was conducted prior to excavation and drilling to locate detectable services as a precautionary measure.

- c. Collection of soil samples (including 10% for QA/QC) from the test pits and test bores at broadly regular intervals and, based on field observations, at signs of contamination (staining or olfactory signs).
- d. At BH5, soil samples were collected at 0.5m intervals to evaluate the potential for the presence/absence of acid sulphate soils and saline soils;
- e. Screening of all soil samples for contamination purposes using a calibrated photo-ionisation detector (PID) for volatile organic compounds;
- f. Screening of nine samples for field pH and oxidised pH to provide an indication of the samples most likely to be ASS;
- g. Despatch of 23 selected soil samples to a NATA accredited laboratory for quantitative analysis for the following potential contaminants:
- The priority heavy metals arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc (23 soil);
 - Polycyclic Aromatic Hydrocarbons (PAH) (23 soil);
 - Total Petroleum Hydrocarbons (TPH) and benzene, toluene, ethyl benzene and xylenes (BTEX) (23 soil);
 - Organochlorine pesticides (OCP) and Organophosphate pesticides (OPP) (11 Soil);
 - Total Phenols (11 soil);
 - Polychlorinated biphenyls (PCB) (11 soil);
 - Asbestos (13 soil/ material);
 - Toxicity Characteristic Leaching Procedure tests for metals and PAHs (4 samples);
- h. Despatch of nine selected soil samples to a NATA accredited laboratory for pH and electrical conductivity (Ec) to assess the potential for saline soils;
- i. Despatch of three selected soil samples to a NATA accredited laboratory for suspended peroxide oxidation combined acidity and sulphate (SPOCAS) to assess the potential for acid sulphate soils;
- j. Collection and analysis of the following samples for QA/QC purposes:
- 1 intra-laboratory and 1 inter-laboratory field replicate soil samples for heavy metals and TPH;
 - 2 trip blanks for TPH/BTEX; and
 - 2 trip spikes for BTEX
- k. Soil textural classification on nine soil samples collected from BH5 for the preliminary salinity assessment.

Reporting Component

- a. Preparation of this preliminary Contamination, Salinity and Acid Sulphate Soil Assessment which details the methodology, results of the assessments, a discussion of the analytical results and recommendations for further work if considered necessary.

3. Background and Previous Reports

Whilst DP has previously undertaken a number of contamination investigations within the overall Royal Randwick Recourse (RRR), these assessments focussed on other areas of the RRR such as the New Days Stalls site which is located approximately 500m to the north-west of the current study area. Similar contamination issues were not encountered in the current study area. Nevertheless, the following reports have been referenced with the objective of obtaining site history information (refer Section 6) which is relevant to the current study area:

- *Report on Preliminary Waste Classification, Proposed New Day Stalls, Randwick Racecourse, Alison Road, Randwick*, reference 45236, dated 28 November, 2007;
- *Report on Supplementary Waste Classification Proposed New Day Stalls, Randwick Racecourse, Alison Road, Randwick*, reference 45236.03, dated 15 April, 2008;
- *Final Report on Contamination and Validation Assessment, New Day Stalls Site, Randwick Racecourse*, reference 45236.08, dated March 2010.
- *Environmental Management Plan, New Day Stalls Site, Randwick Racecourse*, reference 45236.08, dated March 2010.

In addition to the above, a Heritage Impact Assessment Report was also undertaken at the Stables Precinct by Graham Brooks and Associates Pty Ltd (GBA) in August 2010. The results of the assessment were reported in their report titled '*Draft Royal Randwick Racecourse, Stables Precinct, Statement of Heritage Impact*' (dated August 2010). As the GBA assessment was undertaken for the proposed development, the key findings of the report are summarised in Section 3.1 below.

3.1 GBA Draft Heritage Impact Statement (dated August 2010)

The GBA assessment was undertaken to analyse the heritage impact of the proposed development at the Stables Precinct. Based on the results of the assessment, the GBA report concluded that the primary heritage significance of the Stables Precinct is its continued function as a stabling and training area. Further, the proposed new facilities are expected to 'reinforce this significance, and is consistent with the overriding aim of the *Royal Randwick Racecourse Development Control Plan* which is to optimise the Royal Randwick Racecourse as a thoroughbred, racing, training and spectator facility of highest quality'.

4. Site Description

The site is identified as the 'proposed Stables Precinct' and is located within the boundaries of the RRR. It is an irregular shaped land parcel that forms part of Lot 1 in Deposited Plan 130234 and has been leased to the Australian Jockey Club. The local government authority is the Randwick City Council. Based on information provided by the client, it is understood that the site covers an area of approximately 9 hectares.

The area of investigation is located in the south-western portion of the RRR and is bounded by Wansey Road to east, Alison Road to the north, the racetrack to the west and the "Steeple Hills Precinct" to the south. A portion of the proposed Stables Precinct (central portion) extends into a section of the racetrack area. The study area and location is shown in Drawing 1, Appendix A. At the time of the current investigation:

- The north-eastern portion of the site was occupied by nine dilapidated stalls of timber construction, a dilapidated farrier's workshop and unroofed sand rolls (utilised for horses to roll in after the removal of tack). In addition, a single storey residential building (Wansey Cottage) is also located in this section of the site;
- A two storey building of brick construction (Steward's Office/tearoom) was located in the northern portion of the site;
- The central portion of the site was occupied by a training track known as the Bull Ring;
- The southern portion of the site was occupied by unused land and a large diameter stormwater pipe;
- In the eastern portion of the site was a large stockpile of soil that is understood to have been sourced from redevelopment works at other parts of the RRR.
- The remainder of the site comprised unpaved roadways.

The surrounding landuses include:

- To the north-west - The Royal Randwick Racecourse racing track, and Spectator Precinct;
- To the east – Wansey Street and a residential area;
- To the south - the 'Steeple Hill Precinct' which currently comprises stable and training facilities, and further to the south of High Street the University of New South Wales (UNSW) and the Prince of Wales Hospital;
- To the south-west - the 'High Street Precinct' which is currently occupied by stable and training facilities, and further to the west Anzac Parade which is a mixed use corridor for public transport and local strip-shopping

5. Geology and Soil Landscape

Reference to the Sydney 1:100,000 Geological Series Sheet 9130 indicates that the site is underlain by medium to fine grained marine sands. The sands were laid down in recent geological time as transgressive dune deposits over which freshwater swamps were formed, typical of those still existing at Centennial Park and Eastlakes.

With the exception of the stockpiled area in the eastern section, the remainder of the site is relatively flat and tends to fall towards the south-west with an RL of 36 m AHD in the northern portion (in the vicinity of the Steward's office) and an RL of 31m AHD in the southern portion (in the vicinity of the unused land and stormwater pipe). Beyond the eastern boundary, the levels rise rapidly along vegetated slopes that lead to Wansey Street and Alison Road.

Surface water is expected to flow towards the south-west into the local stormwater system. It is considered that, on a regional level, the groundwater is likely to flow in an easterly direction towards Botany Bay.

A review of the Department of Land and Water Conservation (now part of the Department of Environmental, Climate Change and Water - DECCW) *Acid Sulphate Soil Risk Map for Botany Bay (Edition 2, 1997)* indicated that there is no known occurrence at the site and acid sulphate soil (ASS) is not expected to occur in the surrounding environments.

Information sourced from the DP March 2010 *Contamination and Validation Assessment Report for the New Day Stalls* site indicates that, as per the records of the NSW Groundwater Works database of licensed groundwater bores, ten registered bores were present within a 700m radius of the overall RRR. The bores were constructed for a variety of uses including industrial irrigation, recreational, monitoring and domestic purposes (refer Table 2).

Table 2: Summary of Groundwater Bores

Groundwater Bore	Standing Water Level (Bgl) (m)	Depth of Bore (m)	Purpose of Bore	
			Authorized	Intended
GW107342	Unknown	Unknown	Domestic	Unknown
GW106554	Unknown	Unknown	Domestic	Unknown
GW040223	Unknown	7.0	Recreation	Recreation
GW047544	Unknown	23.00	Industrial Irrigation	Industrial Irrigation
GW104773	4.90	25.00	Recreation	Recreation
GW040224	Unknown	7.00	Recreation (Groundwater)	Recreation (Groundwater)
GW075018	0.48	43.00	Monitoring bore	Monitoring Bore
GW107681	Unknown	Unknown	Dewatering	Dewatering
GW024367	Unknown	4.20	Commercial	General Use
GW104525	2.00	17.65	Monitoring Bore	Monitoring Bore

Based on the available data it is considered that some beneficial (domestic, industrial and recreational) use of groundwater may be occurring in the surrounding area.

The NSW Department of Infrastructure and Natural Resources (DIPNR – now Department of Water and Energy DWE) *Salinity Potential in Western Sydney* 2002 map indicates that the site is not located in an area of saline prone soils.

6. Site History

The site history information pertaining to the overall RRR that has been provided in Sections 6.1 - 6.4 has been sourced from the DP March 2010 Contamination Assessment that was undertaken at the New Day Stalls site and the GBA August 2010 *Draft Heritage Impact Statement* that focussed on the current study area. Additionally, historical aerial photographs were also reviewed as part of the current assessment to identify changes that have occurred at the current study area.

6.1 Information Sourced from AJC website

The land currently occupied by the RRR was granted for use as a racecourse in 1833. Between 1833 and 1838, the land was regularly utilised for the purpose of horse racing. As a result of track deterioration, racing activities ceased in 1838 and between 1838 and 1860, the land was used for horse training. The use of the land as a racecourse recommenced in 1860, and in 1863, the Randwick land was granted by the Crown to trustees representing the Australian Jockey Club. In 1961 the Australian Jockey Club (Amendment) Act altered the AJC lease of Randwick racecourse from a 21-year to a 99-year term.

6.2 Historical Title Deeds

As part of the DP March 2010 Contamination Assessment at the New Day Stalls site, a title deed search for the overall RRR was undertaken and has been summarised in this section. Determination of the ownership or occupancy of the property, including company names, can assist in the identification of previous land uses and therefore assist in establishing potentially contaminating activities. The land titles are included in Appendix B.

The land occupied by the Royal Randwick Racecourse (of which the site is a part) is currently registered in the name of Leslie Fredrick Bridge, Ken Arthur Murray and Paul Francis Patrick Whelan and has been leased to the Chairman of the Committee of the Australian Jockey Club since as early as 1907. Ownership of the property from 1915 to 2006 is summarised in Table 3, below, together with the occupation of the owner given in the title and the likely use of the site or nature of the business of the site/owner.

Table 3: Land Ownership Lot 1 DP 130234

Royal Randwick Racecourse			
Lot 1 DP 130234			
Year of Transfer	Owner's Name	Occupation of Owner	Likely Use of the Property
1915	Henry Cary Dangar Adrian Knox Edmund Fosbery	Esquire Barrister of Law Member of Legislative Council	Racecourse
1917	Adrian Knox Edmund Fosbery	Barrister of Law Member of Legislative Council	Racecourse
1917	Adrian Knox Samuel Hordern Richard Halifax Dangar	Barrister of Law; Esquire; and Esquire.	Racecourse
1932	Samuel Hordern Richard Halifax Dangar	Esquire; and Esquire.	Racecourse.
1932	Samuel Hordern Richard Halifax Dangar; and Thomas Lloyd Forster Rutledge	Esquire; Esquire; and Grazier	Racecourse
1941	Samuel Hordern; Thomas Lloyd Forster Rutledge; and George Main	Esquire; Grazier; and Grazier	Racecourse
1955	Samuel Hordern; Thomas Lloyd Forster Rutledge; William McCulloch Gollan; and Maurice Victorian Point	Esquire; Grazier; Member of Legislative Council; Grazier	Racecourse
1963	William McCulloch Gollan; and Maurice Victorian Point	Member of Legislative Council; Grazier	Racecourse
1980	Sidney George White; Robert William Askin; and Laurie John Ferguson	Unknown; Unknown; and Unknown.	Racecourse
1983	Laurie John Ferguson; Tristan Antico; and Leslie Fredrick Bridge	Unknown; Unknown; and Unknown.	Racecourse
2006#	Leslie Fredrick Bridge; Ken Arthur Murray; and Paul Francis Patrick Whelan	Unknown; Unknown; and Unknown.	Racecourse

= Current Owner

6.3 WorkCover, NSW Records

As part of the DP March 2010 Contamination Assessment, a review of WorkCover NSW records pertaining to the overall RRR was undertaken. Therefore, during the current assessment, DP reviewed these WorkCover NSW records to verify whether any dangerous goods were stored in the current study area. The review indicated that that no dangerous goods were stored within the boundaries of

the site currently being investigated (proposed Stables Precinct). The NSW WorkCover records pertaining to the Randwick Racecourse are provided in Appendix C. WorkCover records did, however, indicate the presence of three underground storage tanks (USTs), two aboveground storage tanks, oil storage drums and two bowzers in the vicinity of the maintenance workshop located south-west of the current area of investigation. In this regard, it is noted that in February 2009, DP undertook a remediation and validation assessment for the removal of the above-mentioned USTs and AST. The results of the assessment were presented in DP's report titled '*Remediation and Validation Assessment, High Street Connection, Randwick Racecourse*' dated 27 February, 2009 (DP ref: 45781.01-3).

6.4 Information Sourced from GBA August 2010 Heritage Impact Assessment Report

Based on the information provided in the GBA report, it is understood that the current study area has been utilised as part of the racecourse for training purposes since at least 1860. A number of the stalls in the north-eastern portion were constructed in 1919 and the training area is understood to have evolved from a large, single training track to formal training rings in the 1920s. Modifications during 1951 and 1961 resulted in the addition of the farrier's workshop. Further, the stalls and other areas of the site have been modified over time and the current configuration of the site can be traced back to the 1980s.

6.5 Historical Aerial Photographs

1930 Image (Plate 1)

The 1930 aerial image indicates that the racecourse was operational at this stage. With regard to the current study area, the stalls in the north-eastern portion of the site had already been constructed. The image indicates two circular landforms in the central portion of the site which most probably was the training ring. There appear to be a number of roadways leading to the stables area. The remainder of the site appears to be vegetated.

1943 Image (Plate 2)

The 1943 aerial photograph indicates that the site remained relatively unchanged since 1930.

1951 Image (Plate 3)

The 1951 image indicates that the site remained relatively unchanged since 1930 and 1943.

1965 Image (Plate 4)

The 1965 aerial photograph indicates that the site remained relatively unchanged since 1951.

1970 Image (Plate 5)

The site appears to be relatively unchanged since 1951.

2000 Image (Plate 6)

The site appears to have undergone minor changes when compared to the 1970 image. The two circular landforms that were first seen in the 1931 image appear to have been replaced by a single oval shaped ring which is similar to the present day training ring. A fence has been erected around the oval ring. Further, there appear to be some minor earthmoving activities in the eastern portion of the site that is currently occupied by the stockpile. The site layout appears to be relatively similar to the present day layout.

2007 Image (Plate 7)

The site appears to be relatively unchanged since 2000.

The historical aerial photographs for the site are provided in Appendix B.

7. Potential for Contamination

In general contaminants may be present on site due to the placement of imported fill. Therefore, the soil samples were assessed for a combination of the following suite of the common contaminants:

- The priority heavy metals arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc;
- Polycyclic Aromatic Hydrocarbons (PAH);
- Total Petroleum Hydrocarbons (TPH) and benzene, toluene, ethyl benzene and xylenes (BTEX);
- Organochlorine pesticides (OCP) and Organophosphate Pesticides (OPP);
- Total Phenols;
- Polychlorinated biphenyls (PCB); and
- Asbestos.

To address the potential for groundwater impacts, a groundwater monitoring well was installed in BH5 the groundwater sample was analysed for the following:

- Priority Heavy metals (As, Cd, Cr, Pb, Cu, Hg, Ni, Zn);
- Monocyclic Aromatic Hydrocarbons;
- Total Petroleum Hydrocarbons;
- Polycyclic Aromatic Hydrocarbons;
- Polychlorinated Biphenyl;
- Organochlorine Pesticides ;
- Phenols; and
- pH and hardness.

8. Fieldwork

The current assessment at the proposed Stables Precinct comprised soil sampling from eight test pits (TP103 and TP110) and two test bores (BH5-BH6), installation of one groundwater monitoring well in BH5 and groundwater sampling in accordance with scope works provided in Section 2.

Fieldwork was undertaken on 20 and 23 August 2010. Prior to the commencement of drilling/test pitting all test locations were checked for underground services using an electronic scanner and a review of available plans. A differential GPS was used to determine the position of each test bore/pit. The test bore/pit logs and coordinates are provided in Appendix D.

Test pits 103 and 110 were excavated by means of a backhoe to nominal depths of 3-4 m bgl or 0.5 m into natural material (whichever was the lesser). Bores BH5 and BH6 were drilled to nominal depths of 3 m bgl with a bobcat mounted rig using solid flight augers. In this regard, it is noted the BH5 was extended to a nominal depth of 6 m bgl with the objective of intercepting the groundwater table, installing a groundwater monitoring well and for acid sulphate soil and soil salinity sampling. Soil samples were collected at regular intervals, at signs of contamination (eg., odours or staining) and at profile changes.

8.1 Environmental Soil Sampling Procedures

Environmental sampling was performed according to standard operating procedures outlined in the DP *Field Procedures Manual*. All sampling data was recorded on DP chain-of-custody sheets. The general soil sampling procedure comprised:-

- decontamination of all re-usable sampling equipment using a 3% solution of phosphate free detergent (Decon 90) and distilled water prior to collecting each sample or use of disposable sampling equipment;
- transfer of samples into laboratory-prepared glass jars and capping immediately with teflon lined lids;
- collection of at least 10% replicate samples for QA/QC purposes;
- labelling of sample containers with individual and unique identification, including project number, sample location and sample depth; and
- placement of the sample jars and replicate sample bags into a cooled, insulated and sealed container for transport to the laboratory.

SGS Australia Pty Ltd and Labmark laboratories, accredited by the NATA, were employed to conduct the sample analysis. The laboratories are required to carry out routine in-house QC procedures.

8.2 Groundwater Monitoring Well (Piezometer) Construction and Sampling Details

One piezometer was installed in BH5 to a nominal depth of 5 m bgl (refer Drawing 1, Appendix A). Piezometer construction details are presented in the Test Bore Logs in Appendix D.

The piezometer was constructed of 50 mm diameter acid washed, class 18 PVC, casing and machine slotted well screen intervals. Joints were screw threaded, thereby avoiding the use of glues and solvents which may contaminate the groundwater. The well was completed with a gravel pack extending at least 0.3 m above the well screen and, thence, a bentonite plug of at least 0.5 m thickness. The well was capped and finished flush with the ground by means of a Gatic.

The water level in BH5 was recorded prior to development using an electronic interface probe which can detect the presence of separate phase liquid in the water column (such as light non-aqueous phase liquids (LNAPL) including petroleum hydrocarbons). No free product or separate phase liquid was detected in the BH2. Subsequently, the well was developed on 3 September, 2010, by removing a minimum of three bore volumes of water using a typhoon pump. The well construction and development details are summarized in Table 4 below.

Table 4: Piezometer Construction Details

Bore ID	Location of Groundwater Monitoring Well	Bore Depth (m bgl)	Screened Interval (m bgl)	Pre-purge Standing Water Level Depth (m bgl)	Well Volume (L)	Volume Purged (L)	Standing Water Level After Well Development (m bgl)	Method of Purging
BH5	Adjacent to the tracks and in the vicinity of the proposed tunnel	4.54	2.0-5.0	3.53	7.5	50	3.53	Typhoon Pump

Groundwater sampling was undertaken using a decontaminated, low-flow geo-pump. The decontamination procedures for the pump consisted of a "three bucket wash" i.e. the equipment was rinsed of sediment in tap water then decontaminated using a 3% Decon 90 solution and rinsed using demineralised water. Field parameters were measured using a 90FLMV water quality meter, with the probes placed inside a flow-through cell. The flow-through cell's inlet was directly from the micro-purge pump and the outflow was collected in a bucket for disposal. Measurement of field parameters including depth to water (DTW), dissolved oxygen (DO), temperature, pH, electrical conductivity and turbidity were measured constantly during purging. The samples were collected after stable readings were obtained for pH, conductivity, dissolved oxygen and temperature (Refer Section 11.3). Samples were carefully decanted from the flow-through cell connected to the geo-purge pump, into laboratory prepared sampling vessels including hydrochloric acid (HCl) preserved BTEX vials. The groundwater sample collected for heavy metal testing was filtered in the field through a 45 µm membrane filter into nitric acid preserved bottles.

Collection of groundwater samples was carried out in accordance with the methodology prescribed in the *DP Field Procedures Manual*. Sample handling and transport was as set out below:-

- sample containers (supplied by the laboratory) were labelled with individual and unique identification, including project number and sample number;
- collection of one replicate sample for QA/QC purposes;
- samples were placed in insulated coolers and maintained at a temperature of approximately 4°C until transported to the analytical laboratory; and
- chain-of-custody documentation was maintained at all times and countersigned by the receiving laboratory on transfer of samples.

All samples were dispatched to NATA accredited laboratories for analysis under chain-of-custody documentation.

8.3 Acid Sulphate Soil Screening

Samples collected from BH5 were screened for pH and peroxide pH to check for signs of potential acid sulphate producing soils. On the basis of the pH screening results, three samples were despatched to SGS, a National Association of Testing Authorities (NATA) accredited analytical laboratory, for suspended peroxide oxidation acidity and sulphate (SPOCAS) testing as per Method 21 of the *NSW Acid Sulphate Soil Management Advisory Committee Manual* (1998) [ASSMAC].

The following methodology was adopted for pH pre-screening:

pH measurement

- placement of 10 mL of soil in small glass container;
- addition of 25 mL of water followed by thorough mixing; and
- measurement of pH using a calibrated Ionode IJ46 pH probe.

Peroxide pH measurement

- placement of 10 mL of soil in small glass container;
- addition of a few drops of pH-adjusted 30% hydrogen peroxide solution;
- observation of sample for effervescence, colour change or odour;
- addition of 25 mL of water followed by thorough mixing; and
- measurement of pH using a calibrated Ionode IJ46 pH probe.

On the basis of the pH screening results, three samples deemed as most likely to be ASS were selected for SPOCAS testing.

The results of pH screening is summarised in Section 11.2.3. Detailed laboratory test results are included in Appendix E.

9. Data Quality Objectives

The scope of the Preliminary Contamination Assessment works has been devised generally in accordance with the seven step data quality objective (DQO) process, as defined in Australian Standard *Guide to the investigation and sampling of sites with potentially contaminated soil Part 1: Non-volatile and semi-volatile compounds* (AS 4482.1 – 2005) and DP's proposal dated 20 July 2010 (revised 13 August 2010) which was accepted by AJC.

The seven step DQO process is as follows:

- 1) State the Problem
- 2) Identify the Decision
- 3) Identify Inputs to the Decision
- 4) Define the Boundary of the Assessment
- 5) Develop a Decision Rule
- 6) Specify Acceptable Limits on Decision Errors
- 7) Optimise the Design for Obtaining Data.

1. State the Problem

The site is required to be rendered suitable for a commercial land use wherein two storey stables and associated infrastructure for the horses will be constructed over the majority of the site. It is also understood that the upper level of the each stable block will comprise eight bedrooms which will be utilised by stable-hands as overnight accommodation on a rotational basis. The purpose of this investigation is to assess the suitability of the site for the intended landuse. This will be achieved by obtaining preliminary data to characterise the soil and groundwater from a contamination perspective and also to verify the presence/absence of saline and acid sulphate soils.

2. Identify the Decision

Based on the information provided at the time of the current assessment, it is understood that the proposed development will comprise construction of 6 two storey stable blocks and associated infrastructure for the horses. It is also understood that the upper level of the stable blocks will comprise 10 bedrooms which will be utilised by stable-hands as overnight accommodation on a rotational basis. Whilst it is noted that the Randwick Racecourse would generally be considered as a recreational open space, the area where the stables precinct is considered to be a commercial site as:

- It is assumed that exposure of the general public to the soil is expected to be minimal, as only a limited number of people are expected to visit the site several times a year (owners, stable-hands and trainers) for relatively short periods (typically 8 hours/day);
- Further, whilst stable-hands will utilise the upper level of the stable blocks for overnight accommodation, it is expected that the overnight stay will be on a rotational basis and will not be permanently occupied by a single person. Therefore, the stable-hands are expected to be exposed to the soils for a maximum duration of 8 hours/day and a maximum period of 10 – 20 years;
- There will be no individual private gardens;
- In addition, other persons that are expected to be exposed to the soil for greater periods of time are the staff associated with the racecourse and the events such as trainers; and

- The Randwick Racecourse has recently extended its lease for the site for a period of 99 years. Therefore, there appears to be no likelihood that the area where the stables will be constructed will be used for any permanent residential purpose and, as such, a 'residential' setting has not been considered for the stables area.

The suitability of the site for a commercial land use will be on the basis of the current preliminary soil and groundwater investigations. As such, the analysis will focus on the contaminants of concern viz., heavy metals, TPH/BTEX, PAH, PCB, OCP/OPP, phenols and asbestos.

The soil analytical data for the stables precinct has been compared to the Site Assessment Criteria (SAC) for a commercial land use. In view of the proposed commercial land use of the site, provisional phytotoxicity based investigation levels (PPILs) were not considered as part of the SAC. The optimal situation is for soil/ filling materials remaining on the site to be within the adopted SAC, therefore, forming a suitable substrate without requiring management. The soil health-based investigation levels (HILs) sourced from the DECC publication *Guidelines for the NSW Site Auditor Scheme* (2006), Appendix II, Column 2 and 4, are summarized in Table 5.

The applicable guidelines for groundwater are the NSW DECC (2007) *Guidelines for the Assessment and Management of Contaminated Groundwater*. The DECC (2007) guidelines state that 'the concentrations must be compared against the existing generic GILs [Groundwater Investigation Levels], if available, which protect the following environmental values':

- *Drinking Water* (Australian Drinking Water Guidelines (NHMRC & NRMCC, 2004));
- *Aquatic ecosystems* (ANZECC & ARMCANZ, 2000).

As the regional groundwater direction is expected to be in a easterly direction towards Botany Bay, the nearest receptor and surface water body is considered to be Musgrave Pond located approximately 2 km north-east of the site. The appropriate Groundwater Investigation Levels (GILs) are, therefore, considered to be the ANZECC *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (2000) trigger values for toxicants in freshwaters for the protection of 95% of freshwater species. The GILs adopted for the site are shown in Table 6.

With regard to waste classification, it is noted that wherever possible the materials will be reused on site. However some surplus material may be present. Any surplus material that requires offsite disposal to landfill requires waste classification. For waste classification purposes, filling materials will be assessed against:

- *NSW DECC Waste Classification Guidelines: Classifying Waste* (2008, revised 2009).

The waste classification criteria for the contaminants of concern are provided in Table 7.

3. Identify Inputs to the Decision

The primary inputs that will be utilized to assess the suitability of the site for a commercial land use are:

- Available site information regarding activities undertaken on the site and the surrounding area;
- Results of previous investigations undertaken by DP and others (outlined in Section 3);

- The local geology, topography and hydrology;
- Potential contaminants;
- Published guidelines for assessing soil and groundwater quality; and
- Field observations/measurements and analytical results from the current assessment.

4. Define the Boundary of the Assessment

The boundary of the assessment is defined by the extent of the works required to construct the proposed Stables Precinct and is shown in Drawing 1, Appendix A. This is considered to be the extent of the contamination assessment.

5. Develop a Decision Rule

The decision rule is the comparison of the analytical results against relevant published guideline criteria including:

- i. NSW DECC *Guidelines for the NSW Site Auditor Scheme 2nd edition* (2006);
- ii. NSW DECC *Guidelines for Assessing Service Station Sites* (1994); and
- iii. ANZECC *Guidelines for Fresh and Marine Water Quality* ANZECC (2000) for the protection of 95% of Marine species; and
- iv. NSW DECCW *Waste Classification Guidelines: Classifying Waste* (2008, revised 2009).

These assessment criteria will be used to evaluate whether the site is suitable for a commercial land use, from a contamination standpoint.

Table 5: Site Acceptance Criteria for Soil

Contaminant	Adopted Site Assessment Criteria (SAC)	Source
TPH C ₆ – C ₉ C ₁₀ – C ₃₆	65 mg/kg 1000 mg/kg	NSW EPA Contaminated Sites <i>Guidelines for Assessing Service Station Sites</i> (1994) threshold concentrations for sensitive land use - soils. Currently there are no other comprehensive, EPA endorsed investigation levels for petroleum hydrocarbons.
BTEX Benzene Toluene Ethylbenzene Xylene	1 mg/kg 1.4 mg/kg 3.1 mg/kg 14 mg/kg	
Metals Arsenic (total) Cadmium Chromium Copper Lead Mercury Nickel Zinc	500mg/kg 100 mg/kg 60% 5000 mg/kg 1500 mg/kg 75 mg/kg 3000 mg/kg 35,000 mg/kg	NSW EPA Contaminated Sites <i>Guidelines for the NSW Site Auditor Scheme</i> (2 nd Edition) (2006) Soil Investigation Levels for Urban Redevelopment Sites in NSW Heath-based Investigation Levels outlined in Column 4, Appendix II for commercial and industrial sites
Total Phenols	42,500 mg/kg	
PAH Total Benzo(a)Pyrene	100 mg/kg 5 mg/kg	NSW EPA Contaminated Sites <i>Guidelines for the NSW Site Auditor Scheme</i> (2 nd Edition) (2006) Soil Investigation Levels for Urban Redevelopment Sites in NSW Heath-based Investigation Levels outlined in Column 4, Appendix II for commercial and industrial sites
PCB	50 mg/kg	
OPP	Not defined	
OCP Aldrin + Dieldrin Chlordane DDT+DDD+ DDE Heptachlor	50 mg/kg 250 mg/kg 1000 mg/kg 50 mg/kg	
Asbestos	No asbestos present in soil at the surface	Correspondence from NSW EPA Director of Contaminated Sites to Accredited Site Auditors

Notes to Table 5:

1. NSW EPA is now part of the NSW Department of Environment and Climate Change and Water (DECCW).
2. DECC now administered by the DECCW.

A contaminant concentration in soil/filling material is considered to be significant if:

- The concentration of the contaminant is more than 2.5 times the site assessment criteria (SAC). Any location more than 2.5 times the SAC is classified as a 'hotspot', requiring further assessment/ management
- For a data of like material, with respect to the health-based criteria, the calculated 95% Upper Confidence Limit of average concentrations (excluding any 'hotspot' concentrations) exceeds the SAC.
- The standard deviation of the results is greater than 50% of the health-based investigation levels (HIL).

Table 6: Groundwater Investigation Levels for the Protection of a Freshwater Ecosystem (ANZECC)^a

Compound	Groundwater Investigation Levels (GILs) (µg/L)
Arsenic	13 ^b
Cadmium	0.2 ^b
Chromium(III)	27.4 ^c
Copper	1.4 ^b
Lead	3.4 ^b
Mercury(Total)	0.6 ^b
Nickel	11 ^b
Zinc	8 ^b
TPH: C ₆ -C ₉	150 ^d
TPH: C ₁₀ -C ₃₆	600 ^d
Benzene	950 ^b
Toluene	300 ^e
Ethyl benzene	140 ^e
Xylene	380 ^e
PAH-total	not available
Naphthalene	16 ^b
Total phenols	320 ^b
PCBs	0.6/0.03 b (Arochlor 1242 and 1254 respectively)

Compound	Groundwater Investigation Levels (GILs) (µg/L)
OCPs	
Chlordane	0.08 ^b
DDT	0.01 ^b
Heptachlor	0.09 ^b

Notes for Table 6:

- Australian and New Zealand Environment and Conservation Council 'Australian and New Zealand Guidelines for Fresh and Marine Water Quality – October 2000'.
- Trigger Values for a 95% Level of Protection of Species in Fresh Water (Table 3.4.1)
- Trigger Values for a 95% Level of Protection of Species in Marine Water (Table 3.4.1) adopted in the absence of trigger values for freshwater species.
- ANZECC threshold not available. It is noted there is a 'low reliability' Interim Working Value (Section 8.3.7) final chronic value of 7 µg/L for petroleum hydrocarbon but that commercial laboratories are not generally able to achieve the necessary detection limits to demonstrate compliance. For reference purposes, DP has referred to other available Australian guidelines for TPH viz. *Airport (Environment Protection) Regulations* (1997), Schedule 2 Water Pollution Accepted Limits: Table 1.03 – Accepted limits of contamination. It should be noted however that these have not been endorsed by DECCW and are used as 'screening levels' only.
- NSW EPA Contaminated Sites *Guidelines for Assessing Service Station Sites* (1994) *Threshold concentrations for sensitive land use, Protection of Aquatic Ecosystem* is adopted in the absence of other comprehensive investigation levels for toluene and ethyl benzene in freshwater.

Table 7: Contaminant Threshold Values (CT1 and CT2) for Classifying Waste by Chemical Assessment without the Leaching (TCLP) Test

Contaminant	Maximum Values of specific contaminant concentration for classification without TCLP	
	General Solid Waste ¹	Restricted Solid Waste
	CT1 (mg/kg)	CT2 (mg/kg)
Arsenic	100	400
Benzene	10	40
Benzo(a)pyrene ²	0.8	3.2
Cadmium	20	80
Chromium (IV) ³	100	400
Ethyl Benzene	600	2400
Lead	100	400
Mercury	4	16
Nickel	40	160
C6-C9 Petroleum Hydrocarbons	650 ⁴	2600 ⁴

Contaminant	Maximum Values of specific contaminant concentration for classification without TCLP	
	General Solid Waste ¹	Restricted Solid Waste
	CT1 (mg/kg)	CT2 (mg/kg)
C10-C36 Petroleum Hydrocarbons	10000 ⁴	40000 ⁴
Phenol	288	1152
Polychlorinated Biphenyls	<50 ⁴	<50 ⁴
Polycyclic Aromatic Hydrocarbons (total)	200 ⁴	800 ⁴
Scheduled Chemicals	<50 ⁴	<50 ⁴
Toluene	288	1152
Xylenes (total)	1000	4000
Asbestos	Not present	Not Present

Notes to Table 7:

1. Values are the same for both general solid waste (putrescible) and general solid waste (non-putrescible)
2. There may be a need for the laboratory to concentrate the sample to achieve the TCLP limit value for benzo(a)pyrene with confidence
3. These limits apply to chromium in the +6 oxidation state only
4. Criteria taken from table for Leachable Concentrations (TCLP) and Specific Contaminant Concentrations (SCC) as no CT criteria available

With regard to natural soil, currently the DECCW has not specified any specific assessment criteria for virgin excavated natural material (VENM). Typically, however, natural soils are compared against the National Environment Protection Measure (NEPM) 1999, Schedule B(1) *Guidelines on the Investigation Levels for Soils and Groundwater, Soil Investigation Levels, Background Ranges* – for background levels. Note that with respect to organic analytes which have no published background levels, the results will be assessed against their practical quantitation limits (PQL).

6. Specify Acceptable Limits on Decision Errors

In order to ensure the quality of the soil and groundwater data, appropriate and adequate quality assurance and quality control (QA/QC) measures and evaluations should be incorporated into the sampling and testing regime.

A field and laboratory QA/QC regime, comprising the collection and analysis of Intra-laboratory and Inter-laboratory replicate samples was implemented to meet the requirements associated with the following data quality indicators (DQIs).

- conformance with specified holding times;
- accuracy of spiked samples within the laboratory's acceptable range (typically 70-130% for inorganic contaminants and greater for some organic contaminants);

- field and laboratory duplicates and replicates samples will have a precision average of +/- 30% relative percent difference (RPD) for inorganic analytes and +/- 50% RPD for organic analytes; and
- field replicates were collected at a frequency of at least 10% of all samples.

7. Optimise the Design for Obtaining Data

In order to ensure the representativeness of the database, sampling locations:

- were distributed in a broad grid pattern across accessible areas of the Stable Precinct; and
- were positioned to obtain representative groundwater quality data.

The sampling locations are presented in Drawing 1, Appendix A.

To optimise the investigation, all samples collected were screened using a calibrated photo-ionisation detector (PID). The results of the PID readings are provided in the Pit/Bore Logs (Appendix D). The interpretation of PID values allowed for better assessment of the investigation samples to determine the analytical programme and the need, if any, for further investigation.

Table 8 summarises the data quality indicators (DQIs) and the procedures designed to enable achievement of the DQIs. For reference purposes, relevant sections of the report are also identified.

Table 8: Data Quality Indicators

DQI	Achievement Evaluation Procedure
Documentation completeness	Completion of field and laboratory chain of custody documentation, completion of test bore report sheets in Appendix E and Appendix – D, respectively
Data completeness	Sampling density based on DP's proposal.
Data comparability	Use of NATA certified laboratories, use of consistent sampling techniques (Appendix F).
Data representativeness	Sampling on a systematic and targeted basis to obtain representative samples. (Section 10)
Precision and accuracy for sampling and analysis	Achievement of 30% RPD for inorganic replicate analysis and 50% for organic replicate analysis, acceptable levels for laboratory QC criteria (Appendix F).

Discussion of how the sampling and analysis programme met the DQIs is provided in Appendix F.

10. Sampling and Analytical Rationale

The DECC *Sampling Design Guidelines 1995* recommends that a minimum of 107 test locations is required for the characterisation a site of up to 9 ha. As part of the current assessment, a total of ten sampling locations i.e., eight test pits and two test bores were utilised to obtain preliminary data pertaining to the contamination status of the site. However, the purpose of the current assessment was to obtain preliminary data on the contamination status of the site the sampling density is considered appropriate for a preliminary assessment. The test pits and bores were placed in a rough grid-pattern at accessible areas of the proposed development area. Further, noting that as part of the proposed development, excavations in the central and western portions of the site would be extended to nominal depths of 4 m bgl for the proposed tunnel, one test bore (BH5) in the western section of the site was extended to a nominal depth of 6 m bgl with to the objective of obtaining data pertaining to groundwater levels and representative groundwater quality at the site. The sampling locations are shown in Drawing 1, Appendix A. As the purpose of the current assessment was to obtain preliminary data on the contamination status of the site and in view of the generally low potential for contamination associated with previous site use, the sampling density is considered appropriate for a preliminary assessment

In addition to the above, soil samples were also collected from BH5 to nominal depths of 6.0 m bgl (i.e., more than 1 metre below the proposed excavation depth) with to the objective of verifying the presence/absence of acid sulphate soils and saline soils at the site. Whilst the site is not located in an area that is prone to either ASS or saline soils (as mentioned in Section 5), soil sampling from BH5 was undertaken to verify the information provided in the published literature.

A total of 23 soil samples (plus one inter-laboratory and one intra-laboratory replicate QA/QC) were analysed for various combinations of the contaminants of concern. In addition, selected samples were extracted and analysed using the TCLP (for preliminary waste classification purposes), SPOCAS (to verify the presence/absence of ASS) and pH and electrical conductivity (EC 1:5 to verify the presence/absence of saline soils) (refer to Table 8).

10.1 Field Quality Assurance and Quality Control (QA/QC)

The field QC procedures for sampling as prescribed in Douglas Partners' *Field Procedures Manual* were followed during the assessment. Field sampling comprised intra- and inter-laboratory replicate sampling at a rate of approximately one replicate sample for every ten samples. QA/QC sampling also consisted of trip spikes and trip blanks. The comparative results of analysis conducted by DP are summarised in Appendix F.

10.2 Laboratory QA/QC

The analytical laboratories are NATA accredited and are required to conduct in-house QA/QC procedures. These are normally incorporated into every analytical run and include reagent blanks, spike recovery, surrogate recovery and duplicate samples. These results are included in the laboratory reports in Appendix E.

Table 9: Analytical Scheme

Sample ID	Heavy Metals	TPH	BTEX	Phenol	PAH	OPP/ OCP/PCB	Asbestos	TCLP	pH	EC _{1:5}	SPOCAS
Stables Precinct Soil											
BH5/ 0-0.3	✓	✓	✓	✓	✓	✓	✓	-	✓	✓	✓
BH5/ 0.6-1.0	-	-	-	-	-	-	-	-	✓	✓	-
BH5/ 1.1-1.5	-	-	-	-	-	-	-	-	✓	✓	-
BH5/ 1.6-2.0	-	-	-	-	-	-	-	-	✓	✓	-
BH5/ 2.1-2.5	-	-	-	-	-	-	-	-	✓	✓	✓
BH5/ 2.6-3.0	-	-	-	-	-	-	-	-	✓	✓	-
BH5/ 3.4-3.9	✓	✓	✓	✓	✓	-	-	-	✓	✓	-
BH5/ 4-4.5	-	-	-	-	-	-	-	-	✓	✓	-
BH5/ 5.5-6.0	-	-	-	-	-	-	-	-	✓	✓	✓
BH6/ 0.3-0.6	✓	✓	✓	-	-	✓	✓	-	-	-	-
BH6/ 0.6-1.0	✓	✓	✓	✓	✓	-	-	-	-	-	-
BD3/ 200810	✓	✓	-	-	-	-	-	-	-	-	-
TP103/ 0-0.3	✓	✓	✓	-	✓	✓	✓	✓	-	-	-
TP103/ 0.4-0.9	✓	✓	✓	-	✓	-	-	-	-	-	-
TP104/ 0-0.2	✓	✓	✓	-	✓	✓	✓	-	-	-	-
TP104/ 0.3-0.8	✓	✓	✓	-	✓	-	✓	-	-	-	-

Sample ID	Heavy Metals	TPH	BTEX	Phenol	PAH	OPP/ OCP/PCB	Asbestos	TCLP	pH	EC _{1:5}	SPOCAS
TP104/ 1-1.6	✓	✓	✓	-	✓	-	-	-	-	-	
BD4/230810*	✓	✓		✓	-	-	-	-	-	-	-
TP105/ 0.3-0.6	✓	✓	✓	-	✓	✓	✓	-	-	-	-
TP105/ 1-1.5	✓	✓	✓	-	✓	-	-	-	-	-	
TP106/ 0-0.3	✓	✓	✓	✓	✓	✓	✓	-	-	-	-
TP106/ 0.4-1.0	✓	✓	✓	✓	✓	-	-	✓	-	-	-
TP107/ 0-0.3	✓	✓	✓	✓	✓	✓	✓	-	-	-	-
TP107/ 0.4-0.6	✓	✓	✓	✓	✓	✓	-	-	-	-	-
TP107/ 0.8-1.3	✓	✓	✓	✓	✓	-	-	-	-	-	-
TP108/ 0-0.3	✓	✓	✓	✓	✓	✓	✓	-	-	-	-
TP108/ 0.6-1.1	✓	✓	✓		✓	-	-	-	-	-	-
TP109/ 0-0.3	✓	✓	✓		✓	-	✓	✓	-	-	-
TP109/ 0.6-1.1	✓	✓	✓		✓	-	-	✓	-	-	-
TP110/ 0-0.3	✓	✓	✓		✓	✓	✓	-	-	-	-
TP110/ 0.5-1.0	✓	✓	✓		✓	✓	✓	-	-	-	-
TP110/ 1.5-2.0	✓	✓	✓		✓	-	✓	-	-	-	-

11. Field Work Results

11.1 Field Observations

Filling was encountered at all sampling locations to depths ranging between 0.3 m – 2.2 m bgl. The deepest fill was encountered in the south-western portion of the site in the vicinity of sampling locations TP108, TP109 and TP110 with the fill in this section ranging to nominal depths between 1.2 m and 2.2 m bgl. At BH5, groundwater was encountered at a nominal depth of 3.53 m bgl (RL 27.47 AHD)

The subsurface profile at the sampling locations is summarised in Table 10 below.

Table 10: Summary of Subsurface Profile at Sampling Locations

Sampling Location	Bitumen / Roadbase	Topsoil	Filling	Natural
TP103	-	-	0 - 0.4 m bgl - Black ashy sand filling with trace timber and some sandstone cobbles	Brown sands from 0.4 m bgl
TP104	-	-	0 - 0.2 m bgl - Brown silty sand filling with trace gravel; 0.2 - 0.9 – Filling – black ash and sand filling with trace gravel and PVC pipe	0.9 - 1.7 m bgl - Grey sands; 1.7 m onwards – yellow sands;
TP105	-	-	0 - 0.2 m bgl – Roadbase filling; 0.2 - 0.7 m bgl – black ash filling with trace gravel.	0.7 - 0.8 m bgl – brown sands; 0.8 - 1.6 m bgl grey sands; 1.6 m onwards – yellow sands.
TP106	-	0 - 0.4 m bgl – Black ashy silty sand topsoil filling with some rootlets and trace gravel.	-	0.4 m onwards – Brown and grey sands.
TP107	-	0 - 0.4 m bgl – Black ashy silty sand topsoil filling with some rootlets and trace gravel and brick fragments.	0.4 - 0.7 m bgl – Black ash filling with some gravel and trace brick fragments	0.7m onwards brown and grey sands.

Sampling Location	Bitumen / Roadbase	Topsoil	Filling	Natural
TP108	-	0 - 0.4 m bgl – Black ashy silty sand topsoil filling with some rootlets and trace gravel, glass and terracotta fragments.	0.4 - 1.2 m bgl – Brown sands (possibly natural)	1.2 m onwards – grey and yellow sands.
TP109	-	0 - 0.3 m bgl – Brown silty sand topsoil filling with some rootlets and trace gravel, glass and charcoal.	0.3 - 1.3 m bgl – Brown silty sand filling with trace terracotta fragments, gravel, metal scraps and charcoal	1.3 m bgl onwards – grey and brown sands.
TP110	-	0 - 0.4 m bgl – Brown silty sand topsoil filling with some rootlets and gravel and trace terracotta and brick fragments.	0.4 - 2.2 m bgl – Dark brown silty sand filling with some shale and concrete boulders and trace PVC, charcoal metal scraps.	2.2 m bgl onwards – grey sands.
BH5	-	0.0.3 m bgl – Brown silty sand topsoil with trace rootlets.	-	0.3 m onwards – white, yellow, yellow mottled orange and grey sands.
BH6	0 - 0.1 m bgl – Bitumen; 0.1 - 0.3 m bgl – Roadbase	-	0.3 - 0.6 m bgl – Dark red-brown silty sand filling with trace gravel;	0.6 m onwards – grey and coffee brown sands.

11.2 Field Testing Results

11.2.1 Soil

Replicate soil samples collected in plastic bags were allowed to equilibrate under ambient temperatures before screening for Total Photoionisable Compounds (TOPIC) using a calibrated Photoionisation Detector (PID). The PID readings were all <2 ppm and typical of Australian soil background levels.

11.2.2 Groundwater

On 3 September, 2010, BH5 was purged and groundwater samples were collected from this piezometer. The groundwater samples were collected using low-flow sampling techniques after stable

readings were obtained for pH, conductivity, dissolved oxygen, turbidity and temperature (presented in Table 11 below).

Table 11: Groundwater Readings Prior to Sampling

pH	Electrical Conductivity (µs/cm)	Dissolved Oxygen (ppm)	Turbidity (NTU)	Temperature (°C)
BH5				
6.38	556	0.11	over NTU ¹	16.5
6.29	533	2.23	over NTU ¹	16.8
6.34	518	2.98	818	16.8
6.38	517	3.97	873	16.8
6.68	493	5.88	832	16.8
6.92	455	6.24	756	16.8
7.11	423	6.7	698	16.8
7.85	423	7.3	654	16.8
7.85	423	7.4	654	16.8
7.85	423	7.3	654	16.8

Note: 1 – Over instrument limit

11.2.3 Acid Sulphate Soil Screening

The results for pH screening undertaken on the samples collected from BH5 are presented in Table 12. Screening results are for indicative purposes only and no firm criteria are applicable. General comparative values for pH screening are provided by ASS Management Advisory Committee (ASSMAC), however it is noted that these may provide a false indication due to potential presence of inclusions in the soil (e.g. organic matter, shells) that may affect the pH values. In general, however, a substantial drop in pH value typically suggests the potential presence of ASS.

Table 12: Results of Acid Sulphate Soil Screening

Sample Location	Depth (m)	pH _F	pH _{FOX}	pH _F - pH _{FOX}	Strength of Reaction
BH5	0 - 0.3	7.58	5.61	1.97	1F
	0.6 - 1	7.08	6.12	0.96	1
	1.1 - 1.5	7.09	6.00	1.09	1
	1.6 - 2.0	6.40	6.04	0.36	1
	2.1 - 2.5	6.39	5.54	0.85	1
	2.6 - 3.0	6.28	5.67	0.61	1
	3.4 - 3.9	5.78	5.32	0.46	1
	4.0 - 4.5	5.43	5.17	0.26	1
	5.5 - 6.0	6.48	6.47	0.01	1
Indicative Values	-	<4/4-5	<3	≥1	-

Notes:

pH_F non-oxidised pH (soil in distilled water) measures existing acidity

pH_{FOX}

1 no or slight reaction

2 moderate reaction

3 vigorous reaction

4 volcanic' reaction

F bubbling/frothy reaction indicative of organics

Indicative Values

screening/selection criteria for SPOCAS analysis

pH_F <4, pH_F = 4-5 may indicate actual acidity

pH_{FOX} <3 may indicate potential acidity

pH_F - pH_{FOX} ≥1 may indicate PASS

12. Laboratory Testing

The results of the laboratory analysis undertaken are presented in the following tables:

- Table 12: Contamination Assessment Laboratory Results – Soils;
- Table 13: Contamination Assessment Laboratory Results – Groundwater;
- Table 14: Preliminary Salinity Results; and
- Table 15: Preliminary Acid Sulphate Soil Assessment Results.

The full laboratory reports together with the chain of custody and sample receipt information is presented in Appendix E.

Table 14 - Spectator Precinct, Groundwater Results

(All Results Reported in µg/L Unless Otherwise Specified)

Sample ID	Heavy Metals								PAH			TPH		Benzene	Toluene	Ethylbenzene	Total Xylene	Total PCB	OCP	OPP's	Phenols (mg/L)	Calcium (mg/L)	Magnesium (mg/L)	Hardness by calculation (mgCaCO ₃ /L)
	As	Cd	Cr~	Cu	Pb	Hg	Ni	Zn	B(a)P	Naphthalene	Total +ve PAH	C6-C9	C10-C36											
DP 2009 Assessment																								
BH5	<1	<0.1	<1	2	<1	<0.1	1	15	<0.5	<0.5	<PQL	<40	<300	<0.5	<0.5	<0.5	<1.5	<PQL	<PQL	<PQL	<0.01	33	6.2	108
BD2/030910	<5	<0.2	<5	<5	<5	<0.1	<5	9	<1	<1	<PQL	-	-	-	-	-	-	-	-	-	-	-	-	-
TS1/030910	-	-	-	-	-	-	-	-	-	-	-	-	-	101%	104%	99%	96%	-	-	-	-	-	-	-
TB/030910	-	-	-	-	-	-	-	-	-	-	-	<40	-	<0.5	<0.5	<0.5	<1.5	-	-	-	-	-	-	-
PQL	4	1	1	1	1		1	1	0.5	<0.5	0.5	10	250	1	1	1	3	0.004	0.002	0.01	0.01			
GIL	13	0.54	27.4	3.5	13.6	0.6	27.5	20	Not specified	16	Not specified	150	600	950	300	140	380	Not specified	0.8/0.01/0.09	Not defined	320			

Notes:

- All Chromium are assumed to exist in the stable Cr(III) oxidation state,
 Guidelines for the NSW Site Auditor Scheme (2nd Edition)

PQL Practical Quantitation Limit

BD2/030910 Inter-laboratory duplicate sample collected at BH5

TS1/030910 Trip Spike

TB/030910 Trip Blank

Exceeds GIL

Table 15: Preliminary Salinity Results

Test Bore	Sample Depth (m)	pH	Soil Texture Group [after DLWC]	Textural Factor [M] [after DLWC]	EC 1:5 [Lab.] (µS/cm)	ECe [M x EC1:5] (dS/m)	Salinity Class [Richards 1954]	Material Type
5	0-0.3	7.2	Sandy loam	14	15	0.2	Non Saline	filling – topsoil
	0.6-1.0	6.7	Sand	17	6	0.1	Non Saline	sand
	1.1-1.5	6.4	Sand	17	7	0.1	Non Saline	sand
	1.6-2.0	6.1	Sand	17	6	0.1	Non Saline	sand
	2.1-2.5	6.0	Sand	17	10	0.2	Non Saline	sand
	2.6-3.0	6.1	Sand	17	9	0.2	Non Saline	sand
	3.4-3.9	5.5	Sandy loam	14	14	0.2	Non Saline	sand
	4-4.5	5.3	Sand	17	21	0.4	Non Saline	sand
	5.5-6.0	6.5	Sandy loam	14	30	0.4	Non Saline	sand

Table 16: SPOCAS Results

Sample ID	SPOCAS Results							
	pHKCl	pHox	Acid Trail (mol H+/tonne)			Sulphur Trail (%)		
			TPA	TAA	TSA	Sp	SKCL	SPOS
BH5/0-0.3	6.8	5.2	<5	<5	<5	<0.005	<0.005	<0.005
BH5/2.1-2.5	5.8	5.8	<5	<5	<5	<0.005	<0.005	<0.005
BH5/5.5-6.0	6.1	6.1	<5	11	<5	<0.005	<0.005	<0.005
Guidelines 2								
Action Criteria if more than 1000 tonnes disturbed (Coarse Texture - Sands to loamy sands)	-	-	18	-	18	-	-	0.03

13. Discussion

13.1 General

The results of the site history search showed that the site has been used as part of the RRR since 1860. The stables in the north-eastern portion, were constructed in 1919 and the training area is understood to have evolved from a large, single training track to formal training rings in the 1920s. Modifications to the site between 1951 and the 1980s resulted in the addition of the farrier's workshop and the current configuration of the site.

The DECC *Sampling Design Guidelines 1995* recommends that a minimum of 107 test locations is required for the characterisation a site of 9 ha. However as the purpose of the current assessment was to obtain preliminary data on the contamination status, the current assessment comprised soil and groundwater sampling from a total of ten sampling locations which is considered to be appropriate for a preliminary contamination assessment.

The results of the field investigations showed that the deepest fill profile was present in the far south-western section of the site in the vicinity of TP110 (to a nominal depth of 2.2 m bgl). Further, the road-tar profile which was seen at the New Day Stalls site was not observed in the current study area. Groundwater was encountered at a nominal depth of 3.53m bgl (RL 27.4 AHD).

Therefore, the site history and the field observations suggest that with the exception of the quality of fill placed on the site, the site has a relatively low potential for contamination. Additionally, as the site has undergone modifications since as early as 1919, there may also be a potential for buried asbestos pipes to be uncovered during bulk excavation works as found during the earthworks phase of the Day Stalls construction.

13.2 Contamination Assessment - Soil Analytical Results

The analytical results for the soil samples showed that the concentration of TPH C₆-C₉, BTEX, PCB, OCP/OPP and phenols in all analysed soil samples were below the laboratory's limit of reporting and within the adopted SAC for a commercial/industrial site. Whilst marginally elevated concentrations of TPH C₁₀-C₃₆ were detected in some samples, these detected concentrations were generally low and well within the adopted SAC. However, the following lead, PAHs and asbestos exceedances were detected in the soil samples collected from the Stables Precinct:

- The concentration of lead in one soil sample viz., TP109/0-0.3 (1500 mg/kg) was detected at the SAC concentration of 1500 mg/kg;
- The concentration of benzo(a)pyrene in two samples viz., TP106/0.4-1.0 (5.9 mg/kg) and TP109/0.6-1.1 (11 mg/kg) exceeded the adopted SAC of 5 mg/kg;
- The concentration of total PAHs in one sample viz., 109/0.6-1.1 (112.34 mg/kg) marginally exceeded the adopted SAC of 100 mg/kg; and
- Asbestos was positively detected in one soil sample viz., TP110/1.5-2.0.

With regard to heavy metals, whilst the concentration of arsenic, cadmium, chromium, copper, mercury, nickel and zinc in all analysed samples were generally low and within the adopted SAC, the concentration of lead in one sample i.e., TP109/0-0.3 (1500 mg/kg) was detected at the adopted SAC concentration of 1500 mg/kg. In view of the detected lead exceedance, a 95% upper confidence limit (UCL) (using 99% Chebyshev (Mean, SD) UCL method) for all lead concentrations in the fill material was calculated and found to be 1008 mg/kg with a standard deviation of 355.1 mg/kg, which is below the adopted SAC. Therefore on the basis of the analytical results and the statistical analysis, the concentration of heavy metals, including lead, in the fill material is considered to be within the adopted SAC.

With regard to B(a)P, in view of the detected B(a)P exceedances in samples TP106/0.4-1.0 (5.9 mg/kg) and TP109/0.6-1.1 (11 mg/kg), a 95% UCL was calculated (using 95% KM Chebyshev UCL method) for all B(a)P concentrations in the fill material and was found to be 4.878 mg/kg with a standard deviation of 1.603 mg/kg which is within the adopted SAC. Therefore, on the basis of the analytical results and the statistical analysis, the B(a)P concentrations in the fill material is considered to be within the adopted SAC.

With regard to total PAHs, in view of the detected total PAHs exceedance in sample TP109/0.6-1.1, a 95% UCL was calculated (using 95% KM Chebyshev UCL method) for all total PAH concentrations in the fill material. The results of the 95% UCL calculation showed that the average total PAH concentrations were 54.39 mg/kg with a standard deviation of 28.76 mg/kg which is within the adopted SAC of 100 mg/kg. Therefore, on the basis of the analytical results and the statistical analysis, the concentration of total PAHs in the fill material is considered to be within the adopted SAC.

With regard to asbestos, of the thirteen soil samples that were analysed for this analyte, asbestos (chrysotile, amosite and crocidolite) was detected in only one sample viz., TP110/1.5-2.0 which was collected from TP110 at a nominal depth of 1.5 - 2.0 m bgl. The asbestos was incorporated in a 5 mm X 3mm cement sheet fragment that was found in the soil sample. It is noted that TP110 was excavated in the far south-western portion of the Stable Precinct and was found to have the deepest fill (between 0 m - 2.2 m bgl). The fill in this test pit was relatively distinct when compared to the remainder of the sampling locations and comprised dark brown silty sand with some shale boulders and traces of construction debris such as metal scraps, concrete boulders and PVC up to a nominal depth of 2.2 m bgl suggesting the use of uncontrolled fill in the area. Further, this fill profile was underlain by natural sand which is not considered to be contaminated with asbestos. Therefore, based on the analytical results and the field observations, the fill profile in the vicinity of TP110 is considered to be contaminated with asbestos. Noting that;

- asbestos or asbestos fibres were not detected at the other sampling locations;
- the depth of uncontrolled fill at TP110 (which was also not observed at the remainder of the sampling locations);
- the dark brown silty sand filling profile was not observed at any of the other sampling locations;

it is considered that the asbestos contamination may be limited to this dark brown sand fill profile present at a nominal depth of 0.4 m – 2.2 m bgl located in the vicinity of TP110. Having said this, asbestos contamination tends to be relatively sporadic in nature and is generally associated with construction debris in the fill.

As the current assessment was preliminary in nature, there is insufficient information to delineate the extent of the asbestos contamination in the vicinity of TP110. Therefore, it is recommended that additional investigations comprising step-out sampling at TP110 should be carried out in the south-western section of the Stable Precinct with the objective of delineating the extent of asbestos contamination.

Subsequent to delineating the extent of the asbestos contamination in the vicinity of TP110, remedial works should be undertaken to render the site suitable for the proposed development. Typical remediation options that should be considered are:

1. Removal and disposal of all asbestos contaminated filling material to landfill and validation of the remedial pit to verify the removal of the asbestos contaminated soils. If this option is adopted, a waste classification assessment of the filling material in the vicinity of TP110 would also have to be undertaken. The waste classification should be carried out in accordance with the Department of Environment and Climate Change and Water (DECCW) *Waste Classification Guidelines April 2008* (revised 2009).
2. Alternatively, if substantial quantities of asbestos contaminated fill are identified, on-site containment of the contaminated filling would also be a practical remedial option in view of the absence of groundwater in the impacted horizon and the immobile nature of asbestos. This option consists of placing a marker layer (e.g. geofabric) over the identified asbestos contaminated materials, followed by the placement of a permanent capping layer (consisting of either permanent pavement or the placement of a minimum of 0.5 m of verified clean soil/ filling). An Environmental Management Plan (EMP) should be prepared to detail the ongoing management requirements for the encapsulated asbestos contaminated materials which are to be retained on site beneath capping structures. This option will manage potential exposure of site users to asbestos, without the need for bulk excavation and off-site disposal of substantial quantities of asbestos contaminated filling. The cap and contain strategy is endorsed by enHealth (2005)¹.

13.3 Contamination Assessment - Groundwater Analytical Results

The results of the field screening exercise indicated that groundwater is expected to be intercepted at a nominal depth of 3.53 m bgl (27.4 m AHD) at the Stable Precinct. The analytical results for the groundwater samples showed that the concentration of heavy metals, TPH/BTEX, PAH, OCP/OPP/PCB and phenols were either below the laboratory's limit of reporting or generally low and within the adopted GILs. Therefore, based on the analytical results, the groundwater at the site is not considered to be impacted by heavy metal, TPH/BTEX, PAH, OCP/OPP/PCB and phenol contamination and further groundwater assessment is not deemed necessary.

Given that dewatering may be required as part of the proposed development, the groundwater may need to be assessed specifically for discharge parameters. In this regard, it should be noted that the management of dewatering is the responsibility of the DECCW under the *Water Management Act 2000*. Advice should be sought from the department in regards to licensing requirements. All regulatory requirements relating to dewatering must be met prior to commencement of any dewatering

¹ enHealth (2005), *Management of asbestos in the non-occupational environment*. Department of Health and Ageing

works. Further, it may be necessary to obtain a temporary dewatering license for the duration of the construction works.

13.4 Preliminary Waste Classification Results

It is intended that during the proposed development, wherever possible, the materials generated from bulk excavation works will be reused on site. However some surplus material may be present which may require off site disposal. Therefore, a provisional *in situ* waste classification assessment was conducted as part of the current assessment for the purpose of off-site disposal of any excess material. Classification of the material was generally conducted in accordance with the six step process as set out in the *Waste Classification Guidelines* 2008 (as shown in Table 17).

Table 17: Six Step Waste Classification Process

Step	Comments	Rationale
1. Is it special waste?	TP110 - Yes No - TP103, TP104, TP105, TP106, TP107, TP108, TP109, BH5 and BH6.	Waste not considered to have clinical, or tyre waste. In TP110 asbestos fibres were detected in the sample collected from the 1.5-2.0m fill profile. Therefore, the fill material at TP110 would be pre-classified as Special Waste/Asbestos Waste At TP101, BH1, BH2, BH3 and BH4, asbestos was not identified visually and was not detected in the remainder of the filling material samples. The potential for asbestos contamination, however, exists. Spoil excavated/generated during excavation/earthworks should be specifically checked for the presence of asbestos. If asbestos is found, then the affected material must be classified as Asbestos Waste.
2. Is it liquid waste?	No	Waste composed of sand, concrete rubble and metal scraps and slag (i.e. no liquids).
3. Is the waste "pre-classified"?	TP110 – Yes No - TP103, TP104, TP105, TP106, TP107, TP108, TP109, BH5 and BH6.	Dark brown silty sand fill profile in TP110 is pre-classified as Asbestos Waste. Filling material in TP101, BH1, BH2, BH3 and BH4 is not pre-classified.

Step	Comments	Rationale
4. Does the Waste have hazardous waste characteristics	Laboratory Analysis conducted to confirm whether contaminant concentrations were within General Solid Waste Criteria	Waste not observed to/ or considered at risk to contain explosives, gases, flammable solids, oxidising agents, organic peroxides, toxic substances or corrosive substances, waste not observed to contain coal tar, batteries or dangerous goods containers. However, laboratory analysis was carried out to verify the contaminant concentrations
5. Chemical Assessment	Conducted	Refer to Table 13
6. Is the Waste Putrescible?	No	All observed components of the material comprised material pre-classified as non-putrescible (i.e. silty sand and gravel).

Laboratory results were compared to the General Solid Waste Screening Threshold Values (refer to Table 12).

The preliminary analytical results (without TCLP) for the filling material samples collected from the site indicated the following exceedances of the “screening” criteria for General Solid Waste (non-putrescible) without TCLP:

- The concentration of lead in six samples viz., TP016/0.4-1.0 (120 mg/kg), TP108/0.6-1.1 (120 mg/kg), TP109/0-0.3 (1500 mg/kg), TP109/0.6-1.1 (300 mg/kg), TP110/0-0.3 (110 mg/kg) and TP110/1.5-2.0 mg/kg) exceeded the threshold criteria (100 mg/kg) for General Solid Waste (non-putrescible) without TCLP;
- The concentration of nickel in one soil sample TP103/0-0.3 (51 mg/kg) exceeded the threshold criteria (40 mg/kg) for General Solid Waste (non-putrescible) without TCLP;
- The concentration of B(a)P in five samples TP0106/0.4-1.0 (5.9 mg/kg), TP108/0.6-1.1 (4.1 mg/kg), TP109/0-0.3 (3.1 mg/kg), TP109/0.6-1.1 (11 mg/kg) and TP110/0.5-1.0 (0.87 mg/kg) exceeded the threshold criteria (0.8mg/kg) for General Solid Waste (non-putrescible) without TCLP.

As samples TP109/0-0.3 (1500 mg/kg) and TP109/0.6-1.1 (300 mg/kg) showed the highest lead concentrations, TCLP tests for lead were carried out on these samples. The analytical results showed that the leachable concentration of lead in sample TP109/0-0.3 was 0.7 mg/L and in sample TP109/0.6-1.1 was 0.2 mg/L which were within the threshold concentration for General Solid Waste (non-putrescible) with TCLP.

In view of the detected nickel concentration, sample TP103/0-0.3 was subjected to TCLP analysis for nickel. The results of the TCLP analysis showed that the leachable concentration of nickel in this sample was 0.034 mg/L which is within the threshold concentration for General Solid Waste (non-putrescible) with TCLP.

With regard to B(a)P, samples TP106/0.4 - 1.0 (5.9 mg/kg) and TP109/0.6-1.1 (11 mg/kg) showed the highest B(a)P concentrations and were also considered to be representative of the fill material at the site. Therefore, these samples were subjected TCLP analysis for B(a)P. The results of the TCLP analysis showed that the leachable concentration of B(a)P in these samples was below the

laboratory's limit of reporting (i.e., >0.05 mg/L) and also within the threshold concentration for General Solid Waste (non-putrescible) with TCLP. Further, it is also noted that the total concentration of B(a)P in sample TP109/0.6-1.1 (11 mg/kg) exceeded the threshold concentration of total B(a)P (10 mg/kg) in General Solid Waste with TCLP. In view of the exceedance, a 95% UCL was calculated (using 95% KM Chebyshev UCL method) for all B(a)P concentrations in the fill material and was found to be 4.878 mg/kg with a standard deviation of 1.603 mg/kg which is within the threshold criteria for total lead in General Solid Waste (non-putrescible).

Therefore, on the basis of the total and leachable concentrations of the contaminants, the filling in the vicinity of sampling locations BH5, BH6, TP103, TP104, TP015, TP106, TP017, TP018 and TP019 is provisionally classified as GENERAL SOLID WASTE (NON PUTRESCIBLE) and should be disposed off site to a landfill licensed to receive such waste. At sampling location TP110, asbestos was detected in the soil sample collected from the dark brown silty sand filling present at a depth of 1.5 - 2.0 m bgl. Therefore, the fill material in the vicinity of TP110 is provisionally classified as SPECIAL WASTE (ASBESTOS WASTE) and should be disposed of to a landfill that is licensed to receive such waste.

Whilst asbestos fibres were not detected in the analysed filling material samples collected from TP10, TP104, TP105, TP106, TP107, TP108, TP109, BH5 and BH6 in view of the brick and demolition debris fragments observed at TP107, TP108 and TP019, it is prudent that during earthworks, the excavated filling material should be checked for signs of asbestos. If asbestos contamination is found, then the material must be segregated from the general spoil, to be further assessed/waste classified. All asbestos contaminated waste must be classified and disposed of as Special Waste (Asbestos Waste) to a suitably licensed landfill.

The natural grey/yellow/white sands in the test bore/pit logs is considered to be Virgin Excavated Natural material (VENM), on the proviso that the natural, *in situ* soil does not contain discernible signs of contamination and is not cross-contaminated with any non-VENM material.

13.5 Salinity Results

To verify the presence/absence of saline soils at the site, nine soil samples that were collected from BH5 were analysed for pH and electrical conductivity (EC_{1:5}). The results of the pH and EC_{1:5} analysis are presented in Table 15 (above). Based on the published mapping and the analytical results it is considered that the soils at the site are not saline.

13.6 Acid Sulphate Soil Results

Based on the acid sulphate soil screening results (Section 11.2.3), three selected soil samples from BH5 were despatched to the laboratory for SPOCAS analysis to verify the presence/absence of acid sulphate soils at the site. The results of the SPOCAS analysis are presented in Table 16 (above). The results of the SPOCAS analysis indicate that acid sulphate soils are not present at BH5. Therefore, based on the published mapping and the SPOCAS results, it is considered that acid sulphate soils are not present at the site.

14. Conclusion and Recommendations

The objective of the current assessment was to provide preliminary data on the contamination status and the presence/absence of ASS and saline soils at the proposed Stables Precinct. The assessment comprised a review of previous assessments undertaken at the overall RRR, a site history review and intrusive soil investigations (from ten sampling locations) and groundwater investigations (from one groundwater monitoring well) at the site.

The site history and the field observations suggest that with the exception of the quality of fill placed on the site, the site has a relatively low potential for contamination.

The analytical results for the groundwater samples indicated that concentration of heavy metals, TPH/BTEX, PAH, OCP/PCB/OPP and phenols was generally low and within the adopted GIL. Further, the results of the assessment also showed that acid sulphate soils and saline soils are not present within the proposed development area.

The analytical results for the soil samples showed that concentration of TPH/BTEX, OCPs/PCBs/OPPs and phenols was generally low and within the adopted SAC for a commercial/industrial landuse. Whilst marginal exceedances of lead, B(a)P and total PAHs were detected in some samples, the results of the calculated 95% UCL showed that the concentration of these contaminants was below the adopted SAC.

However, asbestos (chrysotile, amosite and crocidolite) was detected in one sample viz., TP110/1.5-2.0 which was collected from TP110 at a nominal depth of 1.5 - 2.0 m bgl. The fill in this test pit which was relatively distinct to the far south-western portion of the site comprised dark brown silty sand with some shale boulders and traces of construction debris such as metal scraps, concrete boulders and PVC up to a nominal depth of 2.2 m bgl suggesting the use of uncontrolled fill in the area. Therefore, based on the analytical results and the field observations, the fill profile in the vicinity of TP110 is considered to be contaminated with asbestos. As the current assessment was preliminary in nature, it is recommended that step-out sampling at TP110 should be carried out with the objective of delineating the extent of asbestos contamination.

On the basis of the investigation findings, the site can be rendered suitable for the proposed commercial landuse subject to the remediation of the asbestos contaminated soil in the vicinity of TP110.

The results of the provisional *in situ* waste classification assessment showed that the filling is provisionally classified as GENERAL SOLID WASTE (NON PUTRESCIBLE) except in the vicinity of TP110 which is provisionally classified as SPECIAL WASTE (ASBESTOS WASTE). Both wastes should be disposed of to a landfill that is licensed to receive such waste.

Further, during earthworks, if any additional asbestos contamination is found, then the material must be segregated from the general spoil, to be further assessed/waste classified. All asbestos contaminated waste must be classified and disposed of as Special Waste (Asbestos Waste) to a suitably licensed landfill.

The natural grey/yellow/white sands in the test bore logs is considered to be Virgin Excavated Natural material (VENM), on the proviso that the natural, *in situ* soil does not contain discernible signs of contamination and is not cross-contaminated with any non-VENM material.

15. Limitations

Douglas Partners (DP) has prepared this report for a project at the proposed Stables Precinct located within the Royal Randwick Racecourse, Randwick, NSW in accordance with DP's proposal dated 20 July 2010 (Revised 13 August, 2010) and acceptance received from Mr Daniel Lacey of Australian Jockey Club on 30 July 2010. The report is provided for the exclusive use of the Australian Jockey Club for this project only and for the purpose(s) described in the report. It should not be used for other projects or by a third party. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions only at the specific sampling or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of anthropogenic influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by DP in this report may be limited by undetected variations in ground conditions between sampling locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

This report must be read in conjunction with all of the attached notes and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion given in this report.

Douglas Partners Pty Ltd

Appendix A

Drawings



LEGEND

Stables Precinct Site Boundary

Test Pit Location

Borehole

Borehole and Groundwater Monitoring Well

TP110 Positive Asbestos Detection in Sample TP110/1.5-2.0

 Douglas Partners Geotechnics Environment Groundwater	CLIENT: Australian Jockey Club		TITLE: Sampling Locations, Stables Precinct Preliminary Contamination, Salinity and Acid Sulphate Soil Assessment Royal Randwick Racecourse	Project No:	71976.01-2
	OFFICE: Sydney	DRAWN BY: NSA		Drawing No:	1
	SCALE: NTS	DATE: 17.09.2010		Revision:	A

Appendix B

Historical Title Deeds

ACN: 093 398 611
ABN: 61 093 412 474

Peter S. Hopley Pty Limited
Legal Searchers

1 Boronia Avenue
Mount Annan, NSW, 2567
Mobile: 0412 199 304
Fax 9233 4590 (Attn Box 29)

SUMMARY AS TO OWNERS.

Property: - Randwick Race Course

Description: Part Lot 1 D.P. 130234

01.06.1915	Henry Cary Dangar (<i>Esquire</i>) Adrian Knox (<i>Barrister at Law</i>) Edmund Fosbery (<i>Member of the Legislative Council</i>)	Vol 2579 Fol 66
11.12.1917	Adrian Knox (<i>Barrister at Law</i>) Edmund Fosbery (<i>Member of the Legislative Council</i>)	Vol 2579 Fol 66
09.11.1917	Adrian Knox (<i>Barrister at Law</i>) Samuel Hordern (<i>Esquire</i>) Richard Halifax Dangar (<i>Esquire</i>)	Vol 2579 Fol 66
23.08.1932 ?	Samuel Hordern (<i>Esquire</i>) Richard Halifax Dangar (<i>Esquire</i>)	Vol 2579 Fol 66
29.07.1932	Samuel Hordern (<i>Esquire</i>) Richard Halifax Dangar (<i>Esquire</i>) Thomas Lloyd Forster Rutledge (<i>Grazier</i>)	Vol 2579 Fol 66
28.03.1941?	Samuel Hordern (<i>Esquire</i>) Thomas Lloyd Forster Rutledge (<i>Grazier</i>)	Vol 2579 Fol 66
18.03.1941	Samuel Hordern (<i>Esquire</i>) Thomas Lloyd Forster Rutledge (<i>Grazier</i>) George Main (<i>Grazier</i>)	Vol 2579 Fol 66
12.09.1955?	Samuel Hordern (<i>Esquire</i>) Thomas Lloyd Forster Rutledge (<i>Grazier</i>)	Vol 2579 Fol 66
04.07.1955	Samuel Hordern (<i>Esquire</i>) Thomas Lloyd Forster Rutledge (<i>Grazier</i>) William McCulloch Gollan (<i>Member of the Legislative Council</i>) Maurice Victorian Point (<i>Grazier</i>)	Vol 2579 Fol 66

ACN: 093 398 611
ABN: 61 093 412 474

Peter S. Hopley Pty Limited
Legal Searchers

1 Boronia Avenue
Mount Annan , NSW , 2567
Mobile: 0412 199 304
Fax 9233 4590 (Attn Box 29)

20.08.1963	William McCulloch Gollan (<i>Member of the Legislative Council</i>) Maurice Victorian Point (<i>Grazier</i>)	Vol 2579 Fol 66
13.10.1980	Sidney George White Robert William Askin Laurie John Ferguson	Vol 2579 Fol 66
21.06.1983	Laurie John Ferguson Tristan Antico Leslie Frederick Bridge	1/130234
07.03.2006	# Leslie Frederick Bridge # Ken Arthur Murray # Paul Francis Patrick Whelan	1/130234

Current Registered Proprietors

During the course of our search numerous leases were found to
"The Chairman of the Committee of the Australian Jockey Club"
going back as far as 1907

LegalStream Australia Pty Ltd

ABN: 80 002 801 498

Level 15, 115 Pitt Street, SYDNEY NSW 2000, AUSTRALIA * DX654, SYDNEY
Tel: (02) 9231 0122 Fax: (02) 9233 6411 www.legalstream.com.au

An Approved
LPI NSW
Information

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/130234

SEARCH DATE	TIME	EDITION NO	DATE
24/2/2009	8:17 PM	1	7/3/2006

LAND

LOT 1 IN DEPOSITED PLAN 130234
AT RANDWICK
LOCAL GOVERNMENT AREA RANDWICK
PARISH OF ALEXANDRIA COUNTY OF CUMBERLAND
TITLE DIAGRAM DP130234

FIRST SCHEDULE

LESLIE FREDERICK BRIDGE
KEN ARTHUR MURRAY
PAUL FRANCIS PATRICK WHELAN
AS JOINT TENANTS

(AP AC117117)

SECOND SCHEDULE (8 NOTIFICATIONS)

- 1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE CROWN GRANT(S)
- 2 J758496 EASEMENT FOR WATER SEWERAGE AND DRAINAGE 7.62 WIDE AFFECTING PART OF THE LAND ABOVE DESCRIBED DESIGNATED (A) IN THE TITLE DIAGRAM
- 3 DP644957 EASEMENT TO DRAIN WATER 4 WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED SEE DP 644957
- 4 DP644957 EASEMENT TO FLOOD LIMITED BY STRATA 4 WIDE APPURTENANT TO THE LAND ABOVE DESCRIBED SEE DP644957
- 5 L361810 RESTRICTION ON USER (S.27E(6) MAIN ROADS ACT, 1924) - (LOT5 IN DP236188)
- 6 T15486 LEASE TO THE SYDNEY COUNTY COUNCIL OF SUBSTATION PREMISES NO.2919 (1ST FLOOR LVL) TOGETHER WITH RIGHTS OF WAY AND EASEMENTS FOR ELECTRICITY PURPOSES. EXPIRES 31.12.1996
- 7 Z404960 LEASE TO THE SYDNEY COUNTY COUNCIL OF SUBSTATION PREMISES NO.6787 TOGETHER WITH RIGHTS OF WAY AND EASEMENTS FOR ELECTRICITY PURPOSES AS SHOWN IN DP123678. EXPIRES 4.9.2013
- 8 E452870 LEASE TO THE CHAIRMAN OF THE COMMITTEE OF THE AUSTRALIAN JOCKEY CLUB. EXPIRES 30.6.2042

NOTATIONS

DP1045661 NOTE: PLAN OF PROPOSED EASEMENTS
DP1110270 NOTE: PLAN OF PROPOSED EASEMENT FOR ELECTRICITY AND OTHER

END OF PAGE 1 - CONTINUED OVER

nizam

PRINTED ON 24/2/2009

LegalStream Australia Pty Ltd

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Level 15, 115 Pitt Street, SYDNEY NSW 2000, AUSTRALIA * DX654, SYDNEY
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LPI NSW
Information

LAND AND PROPERTY INFORMATION NEW SOUTH WALES - TITLE SEARCH

FOLIO: 1/130234

PAGE 2

NOTATIONS (CONTINUED)

PURPOSES
UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

nizam

PRINTED ON 24/2/2009



Search

☐ Address ☐ Place names ☒ Lot / DP

Lot: 1

Section:

Plan Number: 130234

Get results

Lot T1
1

Section T1
Plan Number T1
130234

Info tool results

Type T1

Details T1



PLAN OF PART OF 81.75 ha GRANT BEING LAND IN
 VOL. 2579 FOL. 66

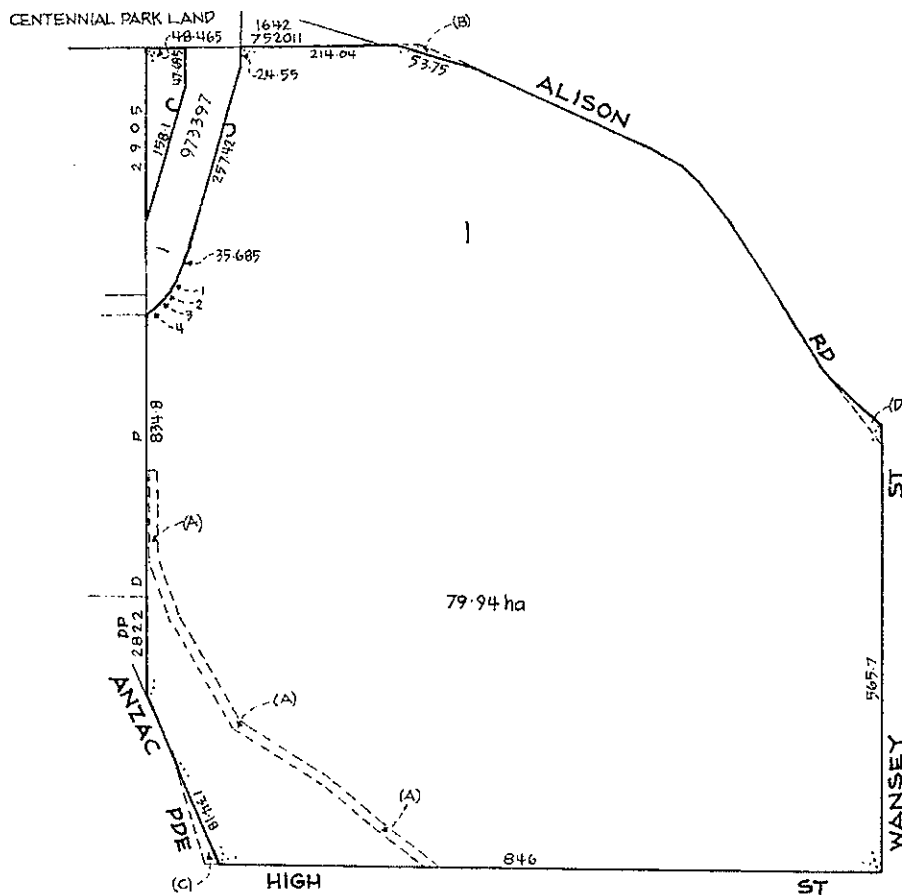
D.P. 130234

20-0090

LGA RANDWICK
 Men./Shire/City
 Town or Locality RANDWICK
 Parish ALEXANDRIA
 County CUMBERLAND
 Reduction Ratio 1: NTS Lengths are in metres

Registered:  20.6.95
 C.A.:
 Title System: TORRENS
 Purpose: DEPARTMENTAL
 Ref. Map: U 1045-813 #
R10876.1603, R11058.1603,
 Last Plan: 8375.3000, 3383.3000

B
1
D
1
O
O
O
Z



- (A) EASEMENT 7.62 WIDE - J 758496
 (B) ROAD R 10876-1603
 (C) ROAD R 11058-1603
 (D) RESTRICTION ON USER VAR. WIDTH - L 361810 (DP 236188)

NOTES

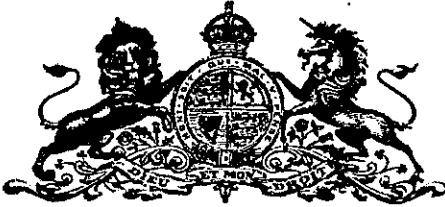
FULL DIMENSIONS ARE NOT AVAILABLE FOR THE
 LOT. ANY DIVISION OF THE LAND HEREIN MAY
 NECESSITATE THE LODGMENT OF A PLAN
 OF SURVEY.

REFERENCE :

NO.	DISTANCE
1	4.755
2	4.79
3	9.59
4	8.115

(C.)

New South Wales.



Reference to last Certificate
(Volume 1525 Folio 146)

[CERTIFICATE OF TITLE.]

(Joint Tenancy)
(Order N° A178698)
(Residue after Notification of Resumption N° 679923)

REGISTER BOOK.

VOL. 2579 FOLIO 66

CANCELLED

ON ISSUE OF NEW FOLIO 1/130234

Henry Cary Dangar Esquire Adrian Knox N. C. Barrister-at-Law and The
Honorable Edmund Hosbery Member of the Legislative Council of Sydney by virtue of Certificate of
Title Volume 1525 Folio 146 now surrendered as to residue after Notification of Resumption N° 679923 are now the proprietors of
an Estate in Fee Simple as Joint Tenants subject nevertheless to the reservations and conditions if any contained in the Grant
hereinbefore referred to and also subject to such encumbrances, liens, and interests as are notified herein in that piece of land
situated in the Municipality of Randwick Parish of Alexandra and County of Cumberland containing One hundred and
ninety seven acres two rods thirty six and one half perches or thereabouts as shown in the plan hereon and therein
edged red being the land delineated in the Public Map of the said Parish in the Department of Lands originally granted to
Edward Davis Thomson, Richard Jones and William Bede Tacey by Crown Grant dated the fifteenth day of June One
thousand eight hundred and sixty three Registered in the Land Titles Office Sydney Volume 1 Folio 46
Exclusively of the land colored yellow in said plan, hereon being Four acres one rod three and one half perches resumed
by the Chief Commissioner for Railways and Tramways by Notification of Resumption N° 679923 the area of which is not
included in the above mentioned area of One hundred and ninety seven acres two rods thirty six and one half perches

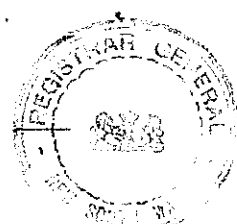
In Witness

whereof I have hereunto signed my name and affixed my Seal this
first day of June One thousand nine hundred and fifteen

Signed the 1st day of June 1915
in the presence of

[Signature]

Deputy Registrar General



Amongst the reservations and conditions contained in the Grant
above referred to are the following namely
Reservations of Minerals &c

[Signature]

Deputy Registrar General

N° 453221 Lease dated the 31st day of January 1907 from
Henry Cary Dangar, Frederick Close Griffiths and Richard
Jones to Adrian Knox of Sydney Esquire as Chairman of
the Committee of the Australian Jockey Club Produced and
entered the 15th day of February 1907 at 10 o'clock in the
forenoon

[Signature]

Deputy Registrar General

Subject to the Road of variable width colored red, in the plan
hereon the area of which namely 4 3/4 perches is not
deducted from the above mentioned statement of area of
197 acres 2 rods 36 1/2 perches
this Road Catalogued K 10876 1603 was resumed under the
Public Roads Act 1902 vide Gazette Notice dated the 15th day of
May 1912 folio 3621

[Signature]

Deputy Registrar General

No. A 351832 NOTICE of DEATH. Proof having been furnished
to me of the death of the said Henry Cary Dangar
the surviving Joint Tenants Adrian Knox and Edmund Hosbery
are now registered sole proprietors of the Land within described.
Produced and entered 11th December 1914
at Bank Hill 2 o'clock in the afternoon

[Signature]

REGISTRAR GENERAL

No. A 351833 TRANSFER dated 9th November 1917
from the said Adrian Knox and Edmund Hosbery to the said
Adrian Knox Edmund Hosbery of Sydney Esquire and Richard
Katharine Dangar of Westfield Esquire as Joint
Tenants of the land within described.
Produced and entered 11th December 1917
at Bank Hill 2 o'clock in the afternoon
[Signature]
REGISTRAR GENERAL

No. A 342841 RESUMPTION of land for PUBLIC ROAD. Notice
in Government Gazette, dated 25th September 1912 folio 5949
whereby and by operation of the Public Roads Act of 1902, the road colored
pink on the plan hereon was declared to be a Public Road, and the same
has become vested in His Most Gracious Majesty KING GEORGE V.
PRODUCED and ENTERED 5th April
1918, at 10 o'clock in the forenoon
[Signature]
REGISTRAR GENERAL

Lease N° 453221 having been procured by
operations of law the memorial of such lease
is cancelled.
Date 2nd February 1920
File A 540328
[Signature]
REGISTRAR GENERAL

A540328 Lease. Dated 4th February 1920
from the said *Adrian Knox, Samuel Henderson and Richard Halifax Dangar* To *The Chairman of the Committee of the Australasian Jockey Club and his successors in office*
Produced and entered 4th March 1920
at 12 o'clock in the noon.
W. H. Wells
REGISTRAR GENERAL.

No. *C131172* NOTICE of DEATH. Proof having been furnished to me of the death of the said *Adrian Knox*
the surviving Joint Tenants *Samuel Henderson and Richard Halifax Dangar*
are now registered sole proprietors of the Land within described.
Produced and entered 22nd August 1932
at 10 o'clock in the forenoon.
W. H. Wells
REGISTRAR GENERAL.

No. *C131177* TRANSFER dated 29th July 1932
from the said *Samuel Henderson and Richard Halifax Dangar*
to the said *Samuel Henderson and Richard Halifax Dangar and Thomas Lloyd Foster Rutledge*
of the Land within described
Produced and entered 22nd August 1932
at 10 o'clock in the forenoon.
W. H. Wells
REGISTRAR GENERAL.

Surrender in Law of the within Lease No. *A540328* by
reason of fresh Lease dated 5th July 1935 No. *C354264*
Dated 23rd August 1935. File *C36269*.

W. H. Wells
Registrar General

No. *C354264* Lease dated 5th July 1935 from the said
Samuel Henderson, Richard Halifax Dangar and Thomas Lloyd Foster Rutledge to *The Chairman of the Committee of the Australasian Jockey Club and his successors in office*
of the Land within described, excluding the road shown by pink
colour in the plan hereon.
Produced 17th July 1935 and entered 23rd August 1935 at 10 o'clock in the forenoon.
W. H. Wells
Registrar General

No. *D11445* NOTICE of DEATH. Proof having been furnished to me of the death of the said *Richard Halifax Dangar*
the surviving Joint Tenants *Samuel Henderson and Thomas Lloyd Foster Rutledge*
are now registered sole proprietors of the Land within described.
Produced and entered 23rd March 1941
at 10 o'clock in the forenoon.
W. H. Wells
REGISTRAR GENERAL.

No. *D11446* TRANSFER dated 13th March 1941
from the said *Samuel Henderson and Thomas Lloyd Foster Rutledge* to the said
Samuel Henderson and Thomas Lloyd Foster Rutledge and George James McDill
of the Land within described, including the road shown
by pink colour on plan hereon.
Produced and entered 28th March 1941
at 10 o'clock in the forenoon.
W. H. Wells
REGISTRAR GENERAL.

Surrender in Law of the within Lease No. *C354264* by
reason of fresh Lease dated 12th July 1963 No. *D871614*
Dated 20th December 1963. File *D871614*.

W. H. Wells
Registrar General

No. *D871614* Lease dated 12th July 1963 from the said
Thomas Lloyd Foster Rutledge and George James McDill to *The Chairman of the Committee of the Australasian Jockey Club and his successors in office*
of the Land within described, including the road shown
by pink colour on plan hereon.
Produced and entered 28th September 1963 at 12 o'clock in the noon.
W. H. Wells
Registrar General

No. *C332502* NOTICE of DEATH. Proof having been furnished to me of the death of the said *George James McDill*
the surviving Joint Tenants *Samuel Henderson, Thomas Lloyd Foster Rutledge and George James McDill*
are now registered sole proprietors of the Land within described.
Produced and entered 12th September 1963
at 12 o'clock in the noon.
W. H. Wells
REGISTRAR GENERAL.

No. *C332503* TRANSFER dated 12th July 1963
from the said *Samuel Henderson and Thomas Lloyd Foster Rutledge* to
the said *Thomas Lloyd Foster Rutledge and Honorable William McCallum*
of the Land within described, including the road shown by pink colour on plan hereon.
Produced 15th July 1963 and entered 12th September 1963
at 12 o'clock in the noon.
W. H. Wells
REGISTRAR GENERAL.

The Honorable William McCallum the surviving Joint Tenants
and *Maurice Victoria Point* are now registered sole proprietors of the Land within described.
See Notice of Death (Section 11) No. *C332502*
Entered 26th August 1963.
W. H. Wells
REGISTRAR GENERAL.

Lease No. *D871614* has been surrendered by
operation of law.
See *J469606*
Entered 20th December 1963.

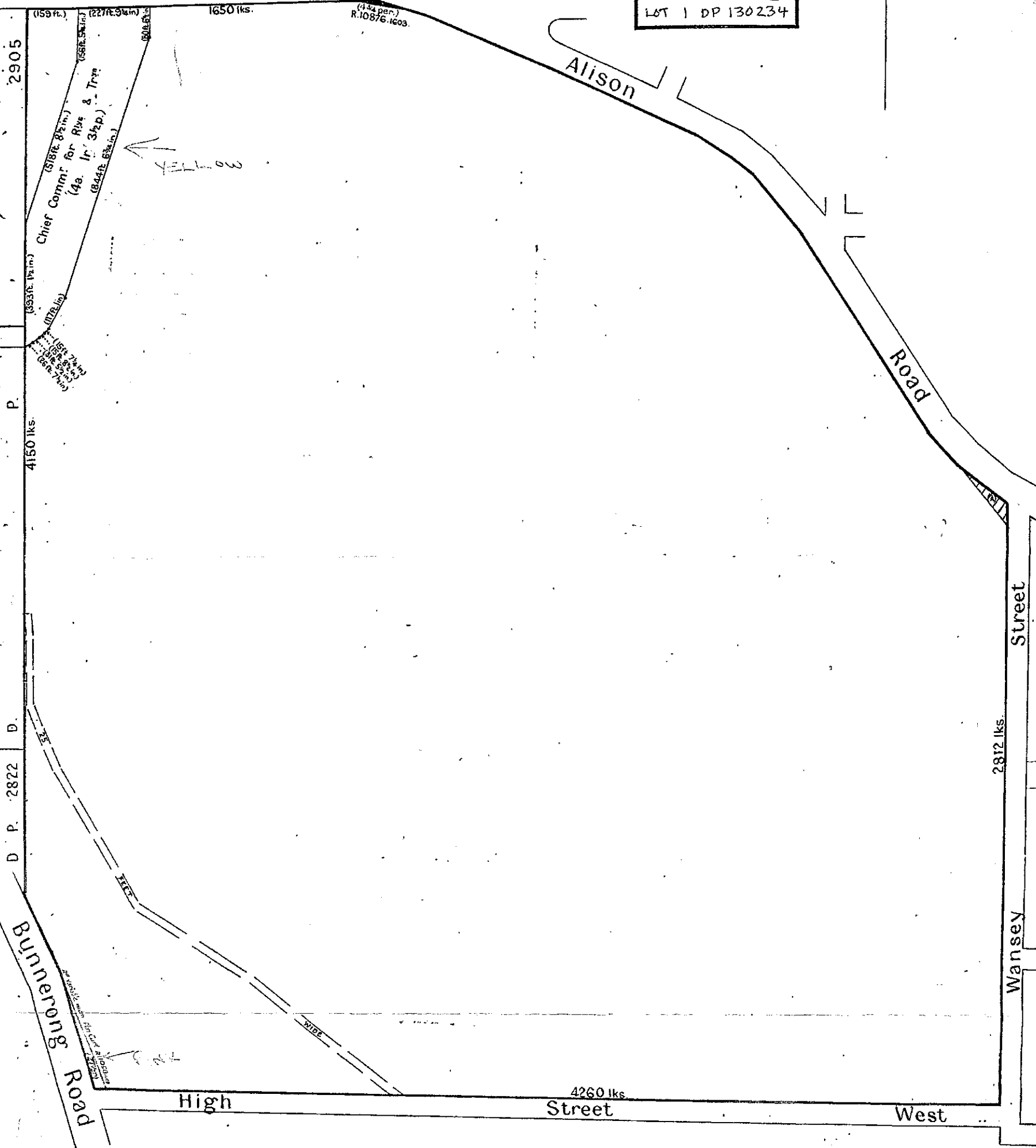
W. H. Wells
Registrar General

No. *J469606* LEASE dated 16th September 1963
to the Chairman of the Committee of the Australasian
Jockey Club of the Land within described excluding
road shown by pink colour on plan hereon.
Entered 20th December 1963.
W. H. Wells
REGISTRAR GENERAL.

No. *J758496* NOTICE OF RESUMPTION
The Metropolitan Water Supply and Sewerage Board
is the proprietor of an easement affecting that part of the land within
described shown as 25 feet wide on the plan hereon, freed from
all other interests.
Entered: 20th October, 1964.
W. H. Wells
Registrar General

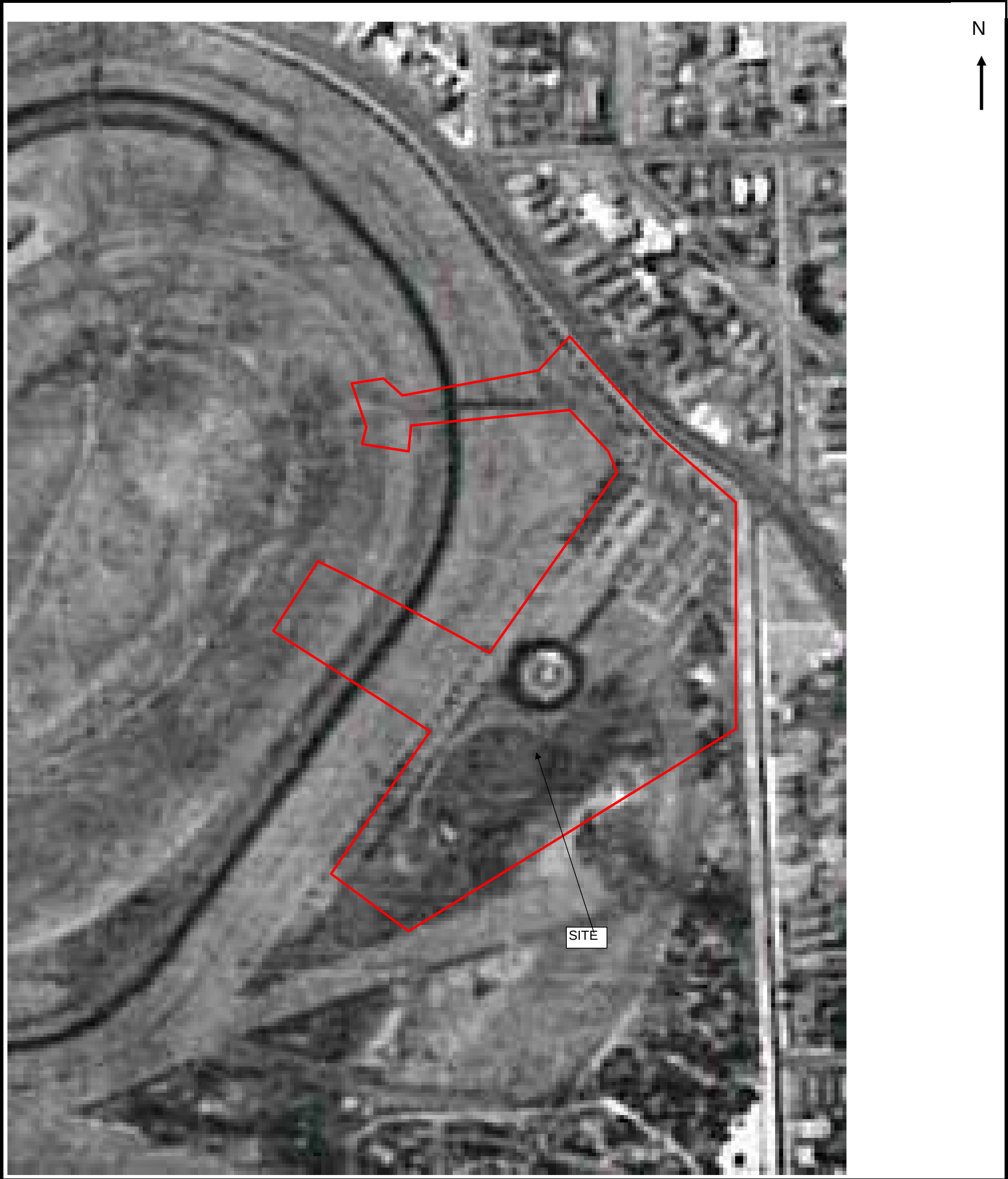
2579-66

THE LAND WITHIN
DESCRIBED IS NOW
LOT 1 DP 130234

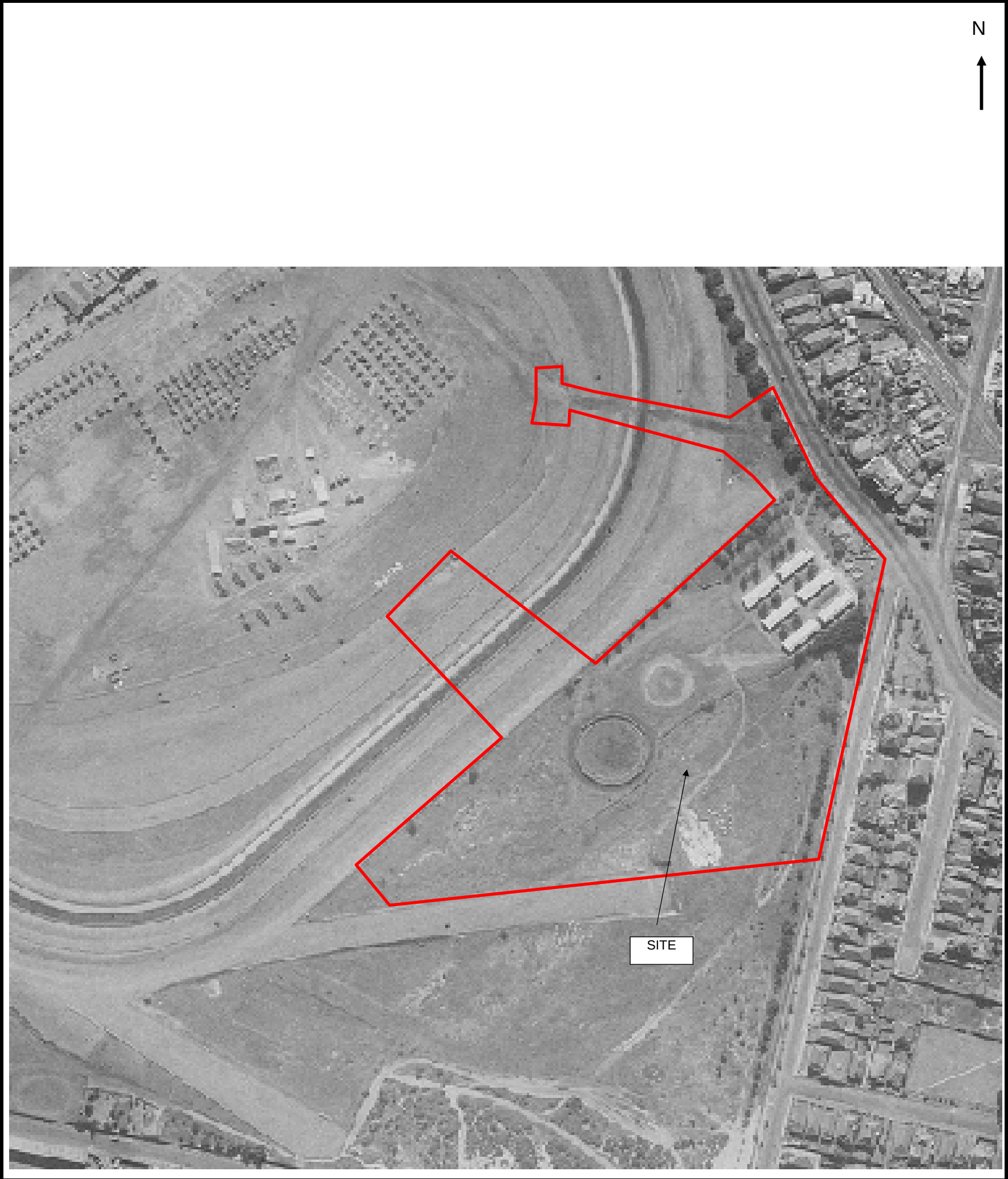


Total area included in certificate, 197a 2r. 36 1/2 p. ex land
colored yellow
Scale 4 chains to one inch

A 170638



Preliminary Contamination, Salinity and Acid Sulphate Soil Assessment Stables Precinct	Project 71976.01-2	September 2010	Plate 1 1930 Image
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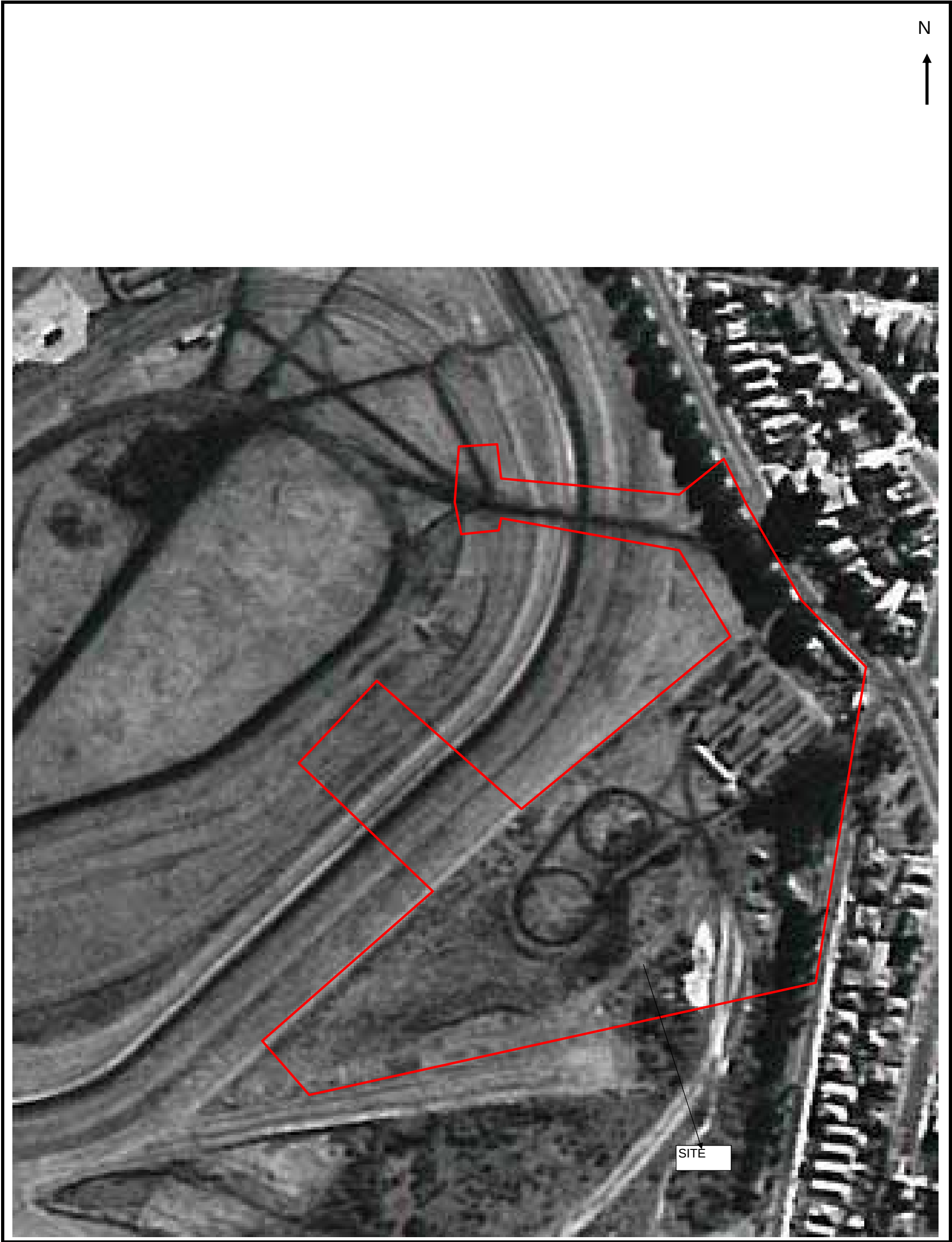
Preliminary Contamination, Salinity and Acid Sulphate Soil Assessment Stables Precinct	Project 71976.01-2	September 2010	Plate 2 1943 Image
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Preliminary Contamination, Salinity and Acid Sulphate Soil Assessment Stables Precinct	Project 71976.01-2	September 2010	Plate 3 1951 Image
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Preliminary Contamination, Salinity and Acid Sulphate Soil Assessment Stables Precinct	Project 71976.01-2	September 2010	Plate 4 1965 Image
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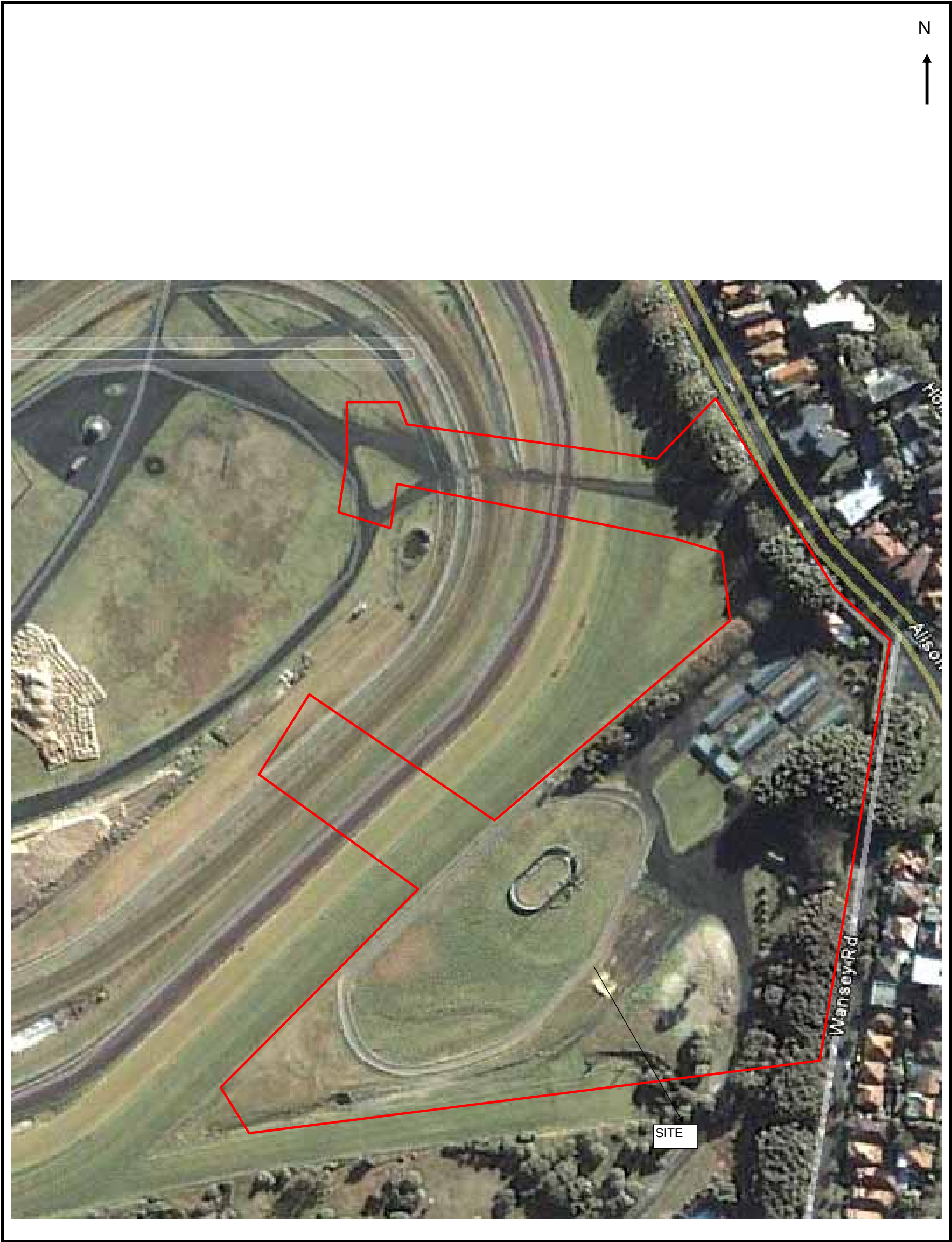


Preliminary Contamination, Salinity and Acid Sulphate Soil Assessment
Stables Precinct

Project
71976.01-2

September
2010

Plate
5
1970 Image



Preliminary Contamination, Salinity and Acid Sulphate Soil Assessment
Stables Precinct

Project
71976.01-2

September
2010

Plate
6
2000 Image



Preliminary Contamination, Salinity and Acid Sulphate Soil Assessment
Spectator Precinct

Project
71976.01-2

September
2010

Plate
7
2007 Image

Appendix C

WorkCover NSW Records



35/003022

AIF

67

Dangerous Goods Licensing

ph (02) 4321 5500 fax (02) 9287 5500

Attn: PAUL BARNES
Licensee: AUSTRALIAN JOCKEY CLUB
RANDWICK RACECOURSE, ALISON RD
RANDWICK NSW 2031

LICENCE FOR THE KEEPING OF DANGEROUS GOODS

ISSUED UNDER AND SUBJECT TO THE PROVISIONS OF THE DANGEROUS GOODS ACT, 1975 AND REGULATIONS THEREUNDER

Licence Number 35/003022 Expiry Date 1/01/2005 No. of Depots 4

Licensee Contact PAUL BARNES Ph. 9663 8465 Fax. 9662 4275

Premises Licensed to Keep Dangerous Goods RANDWICK RACECOURSE
AUSTRALIAN JOCKEY CLUB
ALISON RD RANDWICK 2031

Nature of Site SPORT

Major Supplier of Dangerous Goods UNKNOWN OR OTHER

Emergency Contact for this Site WATCHMEN Ph. 0419 223 660

Site staffing 9 HRS 5 DAYS

Details of Depots

Depot No.	Depot Type	Goods Stored in Depot	Qty
1	UNDERGROUND TANK	Class 3	12000 L
	UN 1203 PETROL		6000 L
2	UNDERGROUND TANK	Class 3	4500 L
	UN 1203 PETROL		2000 L
LPG1	CYLINDER STORE	Class 2.1	250 KG
	UN 1075 PETROLEUM GASES, LIQUEFIED		250 KG
LPG2	CYLINDER(S) IN USE	Class 2.1	450 KG
	UN 1075 PETROLEUM GASES, LIQUEFIED		450 KG

PLEASE RETAIN AS PROOF OF LICENCE

Issued by Workcover Authority of New South Wales on
8 April 2004

WorkCover. Watching out for you.

- 3 DEC 1993

DANGEROUS
GOODS

WORKCOVER AUTHORITY



LICENCE TO KEEP DANGEROUS GOODS

Existing licence, issue 80125 e dated 11/5/91 (Dangerous Goods Act 1975)

Application for new licence, amendment or transfer

EXPIRY : 3.1.95

1. Name of applicant		ACN	
AUSTRALIAN JOCKEY CLUB			
2. Site to be licensed			
No	Street		
	ALISON RD (RANDWICK RACECOURSE)		
Suburb/Town		Postcode	
RANDWICK		2031	
3. Previous licence number (if known) 35 0030220			
4. Nature of site RACECOURSE			
5. Emergency contact on site			
Phone		Name	
663 8521 018 440651		ROD WILLIAMSON - WORKING HOURS DUTY WATCHMAN AFTER HOURS	
6. Site staffing: Hours per day NINE Days per week FIVE			
7. Major supplier of dangerous goods SHORE PETROLEUM			
8. If new site or significant modification			
Plan stamped by:		Accredited consultant's name:	
9. Number of dangerous goods depots at site ONE			
10. Trading name or occupier's name			
AUSTRALIAN JOCKEY CLUB			
11. Postal address of applicant		Suburb/Town	Postcode
RANDWICK RACECOURSE - ALISON RD		RANDWICK	2031
12. Contact for licence enquiries:			
Phone		Fax	Name
663 8521		662 2482	ROD WILLIAMSON
I certify that the details contained in this application (or the accompanying computer disk) are true and correct.			
13. Signature of applicant		Date	
		2/12/93	

Please complete attached site sketch, depot listing and check sheet
(if required) and return to WorkCover Authority in envelope provided.

Site Sketch

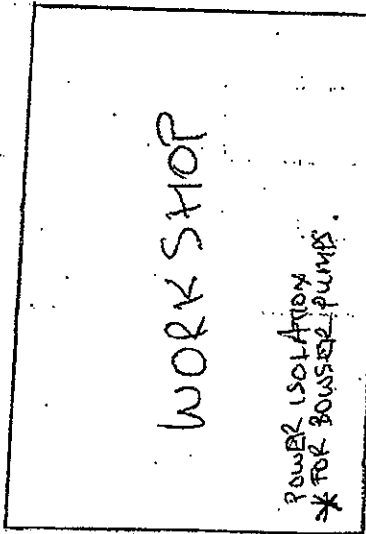
Please carefully read the instructions in Part B of the guide before sketching the site.

356003022

RACE TRACK ADJACENT TO WORKSHOP

* HYDRANT ADJACENT LABORATORY BLDG APPROX 100m.

ROADWAY APPROX 250m TO BOWKAL LANE ENTRY



HYDRANT
APPROX 50m FROM
* WORKSHOP

4,500 L
DIESEL ABOVE GROUND

PETROL BOWSERS

UNDERGROUND
PETROL STORAGE
12,000 L UNLEADED &
4,500 L SUPER

4,500 L
DIESEL ABOVE GROUND

OIL STORE
(DRUMS)

Metro East
SEEN.
C. Devo
Date 11/16/94

N

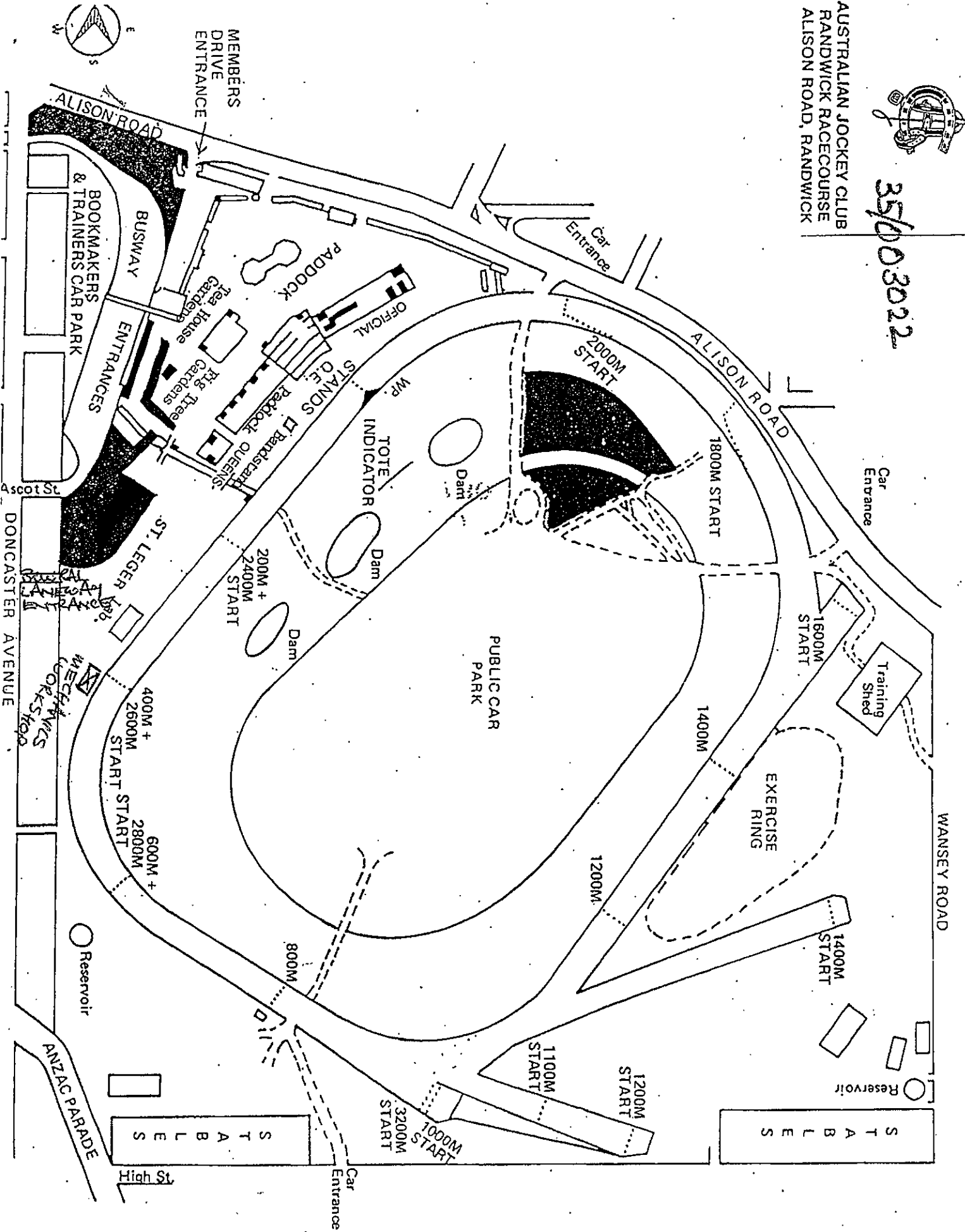
PART B

ROADWAY
APPROX 100m
TO HYDRANT ST.
ENTRY



AUSTRALIAN JOCKEY CLUB
RANDWICK RACECOURSE
ALISON ROAD, RANDWICK

35/003022



AMPOL PETROLEUM LIMITED

A.G.L. CENTRE,
111 PACIFIC HIGHWAY,
NORTH SYDNEY. 2060

BOX 4090, G.P.O., SYDNEY, 2001
TELEPHONE: 929-6222
CABLES: AMPOLCO

Date 24-8-77

JB/sj

The Superintendent,
Dangerous Goods Branch,
Explosives Department,
P.O. Box 846,
DARLINGHURST, N.S.W. 2010

Dear Sir,

(removing)
We wish to advise that we will be (installing)
11,900 (litre) (gallon) underground storage tank (s)
at the following location :-

RAWDICK RACE COURSE
ANSON ROAD
RAWDICK

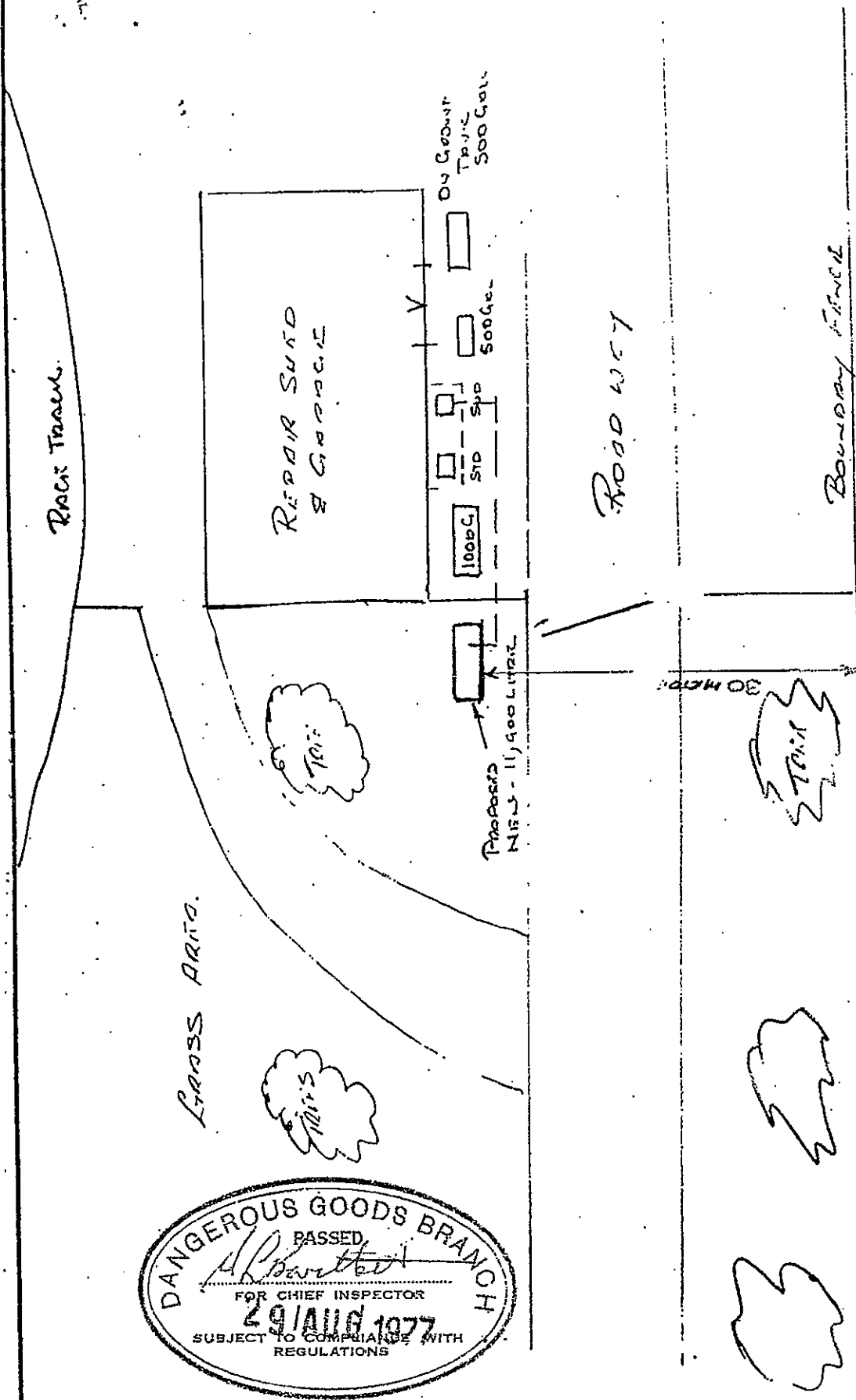
Yours faithfully,

J. BAIKIE
WORKS SUPERVISOR, N.S.W.

Contractor:

BONANZA INST.
31 SHANNON ST
GARDEN SPRING

SUBJECT: Randomized Respiz. (Gurukul, Niz. 11, 900 Ltr.)



LOCATION OF PROPOSED 1500 LINE U.C. TRAIL
AT RANDOLPH RACE COURSE

SCALE: N T 3

DATE: 4. 7. 77

DR BY: J. B. 11/12

FORM B

INFLAMMABLE LIQUID ACT, 1915

LICENCE No. 03022

APPLICATION FOR:

REGISTRATION OF PREMISES
STORE LICENCE
AMENDMENT TO REGISTRATION OR LICENCEB } FOR THE KEEPING OF
INFLAMMABLE LIQUID
AND/OR DANGEROUS GOODS. 01

Name of Occupier

(Surname)

(First Names)

Trading Name (if any)

Postal Address

Postcode

Address of the
premises in which the
spot or depots are
situatedRandwick Racecourse
Alison Road Randwick.

Postcode

2031

Occupation

Horse Racing

Nature of Premises

Racecourse.

Particulars of construction of depots and maximum quantities of inflammable liquid and/or dangerous goods to be kept at any one time.

PLEASE SKETCH SITE ON BACK OR ATTACH PLAN

Tank or Depot Number	Construction of depots *			Inflammable Liquid		Dangerous Goods.						
	Walls	Roof	Floor	Mineral spirit litres	Mineral oil litres	Class 1 litres	Class 2 litres	Class 3 kg	Class 4 m ³	Class 5A# litres	Class 5B# litres	Class 9 litres
1	Underground Tank			12000								
2	✓	✓	✓	5000								
3	✓		✓	2500								
4												
5												
6												
7												
8												
9												
10												
TOTAL												

* If kept in tanks describe depots as underground or aboveground tanks.

Insert water capacity of tanks or cylinders.

Name of Company supplying inflammable liquid AmpolHave premises previously been licensed? Yes Licence No. 3022-1If known, state name of previous occupier As above.

Signature of applicant

R. Paul

Date

13/10/77

CERTIFICATE OF INSPECTION

I, William A. Mathon being an Inspector under the Inflammable Liquid Act, 1915, do hereby certify that the premises or store described above does comply with the requirements of that Act and regulations with regard to its situation and construction for the keeping of inflammable liquid and/or dangerous goods in quantity and nature specified.

INFLAMMABLE LIQUID ACT, 1915 (AS AMENDED)

Applicatig for Registration of Premises or Store Licence under Division A. or for the transfer alteration or amendment of any such Registration or Licence, for the keeping of Inflammable Liquid and/or Dangerous Goods, in accordance with the provisions of the Inflammable Liquid Act, 1915 (as amended), for the ensuing year.

DIRECTIONS

- Applications must be forwarded to the Chief Inspector of Inflammable Liquid, Explosives Department, Box R.216, Royal Exchange Sydney, N.S.W. 2000 and must be accompanied by the prescribed fee, as set out hereunder:
Registration of Premises (Fee \$3.00 p.a.) - For quantities not exceeding 300 gallons of mineral oil and 100 gallons of mineral spirit, if kept together; or 800 gallons of mineral oil and 100 gallons of mineral spirit, if kept separate depots; or 500 gallons of mineral spirit, if kept in an underground tank depot; or 800 gallons of mineral oil and 500 gallons of mineral spirit, if mineral spirit is kept in an underground tank depot.
In addition to, or in lieu of the above, similar quantities of Dangerous Goods of Classes 1 and 2 may be kept under the like conditions; reading Dangerous Goods of Class 1 for the words Mineral Spirit and Dangerous Goods of Class 2 for the words Mineral Oil.
- Store Licence, Div. A (Fee, \$6.50 p.a.) - For quantities in excess of those stated above, but not exceeding 4,000 gallons mineral oil and/or mineral spirit, and/or Dangerous Goods of Classes 1, 2 and 9.
- Store Licence, Div. B (Fee, See Regulation 7) - For quantities exceeding 4,000 gallons of mineral spirit, and/or dangerous goods of Classes 1 and 2, and/or dangerous goods of Class 3.
- For the keeping of Dangerous Goods of Classes 3 and/or 4, (\$15.00 p.a.).
- Fees for the keeping of inflammable liquid and dangerous goods in excess of the above stated quantities and also for Liquid Petroleum Gas storage are set out in Regulation 7.

AMPOA

1. Name of occupier including full christian names.	AUSTRALIAN JOCKEY CLUB
2. Trading Name (if any)	
3. Locality of the premises in which the depot or depots are situated	No. or Name <u>RANDWICK RACECOURSE</u> Street <u>ALISON ROAD</u> Town <u>RANDWICK</u> Postcode <u>2031</u>
4. Postal address	
5. Occupation	<u>HORSE RACING</u>
6. Nature of premises (dwelling, garage etc.)	<u>ENGINEER'S WORKSHOP</u>

7. Particulars of construction of depots and maximum quantities of inflammable liquid and/or Dangerous Goods to be kept at any one time.

PLEASE ATTACH PLAN OF PREMISES

Depot No.	Construction of depots *			Inflammable liquid		Dangerous goods					
	Walls	Roof	Floor	Mineral spirit gallons	Mineral oil gallons	Class 1 gallons	Class 2 gallons	Class 3 lb	Class 4 cu ft	Class 5A water gal	Class 9 gallons
1	<u>Underground Tanks</u>			<u>1000</u>							
2				<u>500</u>							
3											
4											
5											
6											
7											
8											
9											
10											

* If product is kept in tanks describe depots as underground or aboveground tanks.

Signature of applicant X. [Signature]
Assistant Manager

Date of application 5th Jan., 1971

CERTIFICATE OF INSPECTION

APPLICATION for Registration of Premises or Store License under Division for the keeping of Inflammable Liquid in accordance with the provisions of the Inflammable Liquid Act, 1915, for the year ending 30th June, 1932.

3022

DIRECTIONS.

1. Applications must be forwarded to the Chief Inspector of Inflammable Liquids, Explosives Department, Department of Mines, Bridge-street, Sydney, and must be accompanied by the statutory fee, as set out hereunder:—

REGISTRATION OF PREMISES (FEE 10s.).—For quantities not exceeding 300 gallons of oil and 100 gallons of spirit, if kept together; or 800 gallons of oil and 100 gallons of spirit, if kept in separate depots; or 500 gallons of spirit, if kept in an underground tank depot; or 800 gallons of oil and 500 gallons of spirit, if spirit is kept in an underground tank depot.

STORE LICENSE, DIV. A (FEE £1).—For quantities in excess of those stated above, but not exceeding 4,000 gallons mineral oil or mineral spirit.

STORE LICENSE, DIV. B (FEE £2).—For quantities exceeding 4,000 gallons.

23 MAR 1932

2. The certificate of inspection on back hereof must be signed by an Inspector under the Inflammable Liquid Act, 1915, or Police Officer, or other officer duly authorised in that behalf, and where the premises are situated outside the Metropolitan Area it is requested that such certificate be obtained prior to forwarding application.

1. Name in full of occupier	A. J. C.
2. Calling	Racing Club
3. Locality of the premises in which the depot or depots are situated	No. or Name Randwick Racecourse
	Street Allison Road
	Town Randwick
4. Description of premises	Racecourse
5. Will mineral spirit (benzine, petrol, &c.) be kept in same depot with mineral oil (kerosene)?	Underground Tank outside Gal. Iron and Wood Structure Gal. Iron Roof
6. Will mineral oil be completely surrounded by a screen (fireproof) wall?	Gal. Iron Building
7. Will mineral spirit be completely surrounded by a screen (fireproof) wall?	Underground Tank
8. Will mineral oil be kept in a prescribed underground tank depot?	No.
9. Will mineral spirit be kept in a prescribed underground tank depot?	Yes
10. Will mineral spirit in quantities exceeding 3 gallons be kept or used for any industrial purpose?	No.
	State nature of industry.

11. Particulars of construction of depots and quantities of inflammable liquid, &c., to be kept:—

Depot No.	Construction of Depots.			Maximum Quantities of Inflammable Liquid to be kept at any one time.		Nature and Quantity of Other Goods to be kept in Depot (in case of Licensed Store only).
	Walls.	Roof.	Floor.	Mineral Spirit, Gallons.	Mineral Oil, Gallons.	
1	Underground Tank			500	10 GALS	Nil.
2	Iron					
3						

12. Schedule of distances separating depot or depots from protected works (see tables on other side):—

Protected Works	Distance in Feet from Depot.			
	No. 1 to contain not exceeding 300 gallons mineral spirit and 10 gallons mineral oil.	No. 2 to contain not exceeding 300 gallons mineral spirit and 10 gallons mineral oil.	No. 3 to contain not exceeding 300 gallons mineral spirit and 10 gallons mineral oil.	No. 4 to contain not exceeding 300 gallons mineral spirit and 10 gallons mineral oil.
Building in which any person dwells	200			
Building in which persons are accustomed to assemble for the purposes of public concourse, public religious worship, public entertainment or amusement, education or discussion	300			
Public Offices	500			
Stores (bonded or free, or bonded and free combined)	Nil			
Other warehouses	Nil			
Building in which persons are employed for the purpose of any trade or business, and which is not situate on the store	Nil			
Dock, wharf (including any quay, landing-place, landing-stage, jetty, pier, hulk, or other place at which goods are landed, loaded or unloaded), or timber yard,				

23/3/32
22723

Buildings and places comprising the premises.
 Storage Depot
 Adjoins a Gal. Iron & Wood Structure
 with a concrete floor and Gal. Iron roof
 or removed from any other buildings
 fences and well within our own premises,
 the pump of the underground tank being
 fixed in the said Gal. Iron building.

dimensions, including those of the pit or lower part
 designed to prevent outflow.

Underground Tank

in the open

AUSTRALIAN JOCKEY CLUB

Signature of Applicant Chas. H. Cooper
 Date of Application 19.3.1932 Postal Address 6 R. High Street
Sydney N.S.W.

CERTIFICATE OF INSPECTION.

I, A. R. Shaw
 being an Inspector under the Inflammable Liquid Act, 1915, do hereby certify that the
 premises or store herein referred to and described is suitable with regard to its situation
 and construction for the safe keeping of inflammable liquid in quantity and nature specified.
 Place Sydney Signature of Inspector A. R. Shaw
 Date 23/3/32

TABLES SHOWING DISTANCES WHICH UNDER LICENSE MUST SEPARATE PROTECTED
 WORKS FROM DEPOTS.

TABLE I.—Where Mineral Spirit (with or without Mineral Oil) is to be kept:—

In an underground Tank Depot, in quantity exceeding 800 gallons, but not exceeding—	In an above-ground Tank Depot or other Depot wholly surrounded by a screen wall, in quantity exceeding 100 gallons, but not exceeding—	In an above-ground Tank Depot or other Depot not wholly surrounded by a screen wall in quantity exceeding 100 gallons, but not exceeding—	Distance not less than—
Gallons.	Gallons.	Gallons.	Feet.
2,000.	1,000	250	10
4,000	2,000	500	15
20,000	10,000	2,500	20
40,000	20,000	5,000	30
80,000	40,000	10,000	40
Unlimited.	80,000	20,000	50
	160,000	40,000	75
	Unlimited.	80,000	100
		Unlimited.	150

TABLE II.—Where Mineral Oil only is kept or to be kept:—

In an underground Tank Depot, in quantity exceeding 800 gallons, but not exceeding—	In an above-ground Tank Depot or other Depot wholly surrounded by a screen wall, in quantity exceeding 800 gallons, but not exceeding—	In an above-ground Tank Depot or other Depot not wholly surrounded by a screen wall in quantity exceeding 800 gallons, but not exceeding—	Distance not less than—
Gallons.	Gallons.	Gallons.	Feet.
4,000	2,000	1,000	10
8,000	4,000	2,000	15
40,000	20,000	10,000	20
80,000	40,000	20,000	30
160,000	80,000	40,000	40
Unlimited.	160,000	80,000	50
	Unlimited.	160,000	75
		Unlimited.	100

Provided that the distances shown above may be altered proportionately for intermediate quantities.

Provided, also, that the Chief Inspector may authorise a reduced distance in any case where the full distance above prescribed cannot be observed, but where the natural features of

Appendix D

Test Pit/Bore Logs

About this Report

About this Report

Douglas Partners



Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;

- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

Symbols & Abbreviations

Douglas Partners



Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core Drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U ₅₀	Undisturbed tube sample (50mm)
W	Water sample
pp	pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General



Asphalt



Road base



Concrete



Filling

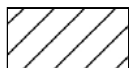
Soils



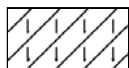
Topsoil



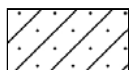
Peat



Clay



Silty clay



Sandy clay



Gravelly clay



Shaly clay



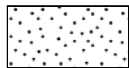
Silt



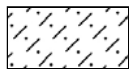
Clayey silt



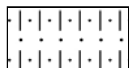
Sandy silt



Sand



Clayey sand



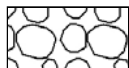
Silty sand



Gravel



Sandy gravel

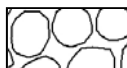


Cobbles, boulders



Talus

Sedimentary Rocks



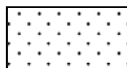
Boulder conglomerate



Conglomerate



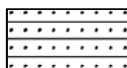
Conglomeratic sandstone



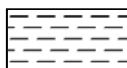
Sandstone



Siltstone



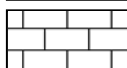
Laminite



Mudstone, claystone, shale

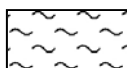


Coal

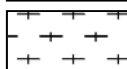


Limestone

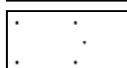
Metamorphic Rocks



Slate, phyllite, schist

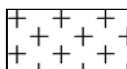


Gneiss

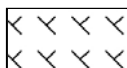


Quartzite

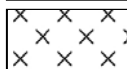
Igneous Rocks



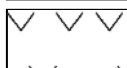
Granite



Dolerite, basalt, andesite



Dacite, epidote



Tuff, breccia



Porphyry

TEST PIT LOG

CLIENT: Australian Jockey Club
PROJECT: Contamination Assessment
LOCATION: Randwick Stable Precinct,
 Randwick Racecourse, Randwick

SURFACE LEVEL: --
EASTING: 336805.7
NORTHING: 6246381
DIP/AZIMUTH: 90°/--

PIT No: TP103
PROJECT No: 71976.01
DATE: 23/8/2010
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.4	FILLING - black ashy sand filling with trace timber and some sandstone cobbles		D	0.0		PID = <1					
					0.3							
		SAND - brown sand		D	0.4							
1					0.9							
		- becoming light yellow		D	1.2		PID = <1					
2					1.8							
2.5		Pit discontinued at 2.5m - target depth reached										
3												
4												
5												
6												
7												
8												
9												

RIG: Backhoe

LOGGED: NSA

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

REMARKS:

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	WV	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	D>	Water seep	S	Standard penetration test
E	Environmental sample	WL	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: Australian Jockey Club
PROJECT: Contamination Assessment
LOCATION: Randwick Stable Precinct,
 Randwick Racecourse, Randwick

SURFACE LEVEL: --
EASTING: 336757
NORTHING: 6246245.6
DIP/AZIMUTH: 90°/--

PIT No: TP104
PROJECT No: 71976.01
DATE: 23/8/2010
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	FILLING - brown silty sand filling with trace gravel		D	0.0		PID = <2					
		FILLING - black ash and sand filling with trace gravel and PVC pipe			0.2							
				D	0.3		PID = <2					
	0.9	SAND - grey sand			0.8							
1				D*	1.0		PID = <1	1				
					1.5							
	1.7	SAND - brown yellow sand			1.8							
2				D			PID = <2	2				
					2.3							
	2.5	Pit discontinued at 2.5m - target depth reached										
3												
4												
5												
6												
7												
8												
9												

RIG: Backhoe

LOGGED: NSA

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS: *Denotes field replicate sample BD4/230810 collected at 1.0-1.6m

☐ Sand Penetrometer AS1289.6.3.3

☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P Piston sample	PL(A) Point load axial test 1s(50) (MPa)	
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test 1s(50) (MPa)	
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	W Water seep	S Standard penetration test	
E Environmental sample	W Water level	V Shear vane (kPa)	

TEST PIT LOG

CLIENT: Australian Jockey Club
PROJECT: Contamination Assessment
LOCATION: Randwick Stable Precinct,
 Randwick Racecourse, Randwick

SURFACE LEVEL: --
EASTING: 336789
NORTHING: 6246178.7
DIP/AZIMUTH: 90°/-

PIT No: TP105
PROJECT No: 71976.01
DATE: 23/8/2010
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.2	FILLING - roadbase filling		D	0.0		PID = <1					
		FILLING - black ash filling with trace gravel		D	0.2		PID = <1					
					0.3							
	0.7				0.6							
	0.8	SAND - brown sand										
1		SAND - grey sand			1.0		PID = <1	1				
				D	1.5							
	1.6	SAND - brown yellow sand			1.7		PID = <1					
2				D	2.2			2				
	2.5	Pit discontinued at 2.5m - target depth reached										
	3											
	4											
	5											
	6											
	7											
	8											
	9											

RIG: Backhoe

LOGGED: NSA

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND					
A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	W	Water seep	S	Standard penetration test
E	Environmental sample	WL	Water level	V	Shear vane (kPa)

TEST PIT LOG

CLIENT: Australian Jockey Club
PROJECT: Contamination Assessment
LOCATION: Randwick Stable Precinct,
 Randwick Racecourse, Randwick

SURFACE LEVEL: --
EASTING: 336730
NORTHING: 6246163.9
DIP/AZIMUTH: 90°/--

PIT No: TP106
PROJECT No: 71976.01
DATE: 23/8/2010
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.4	TOPSOIL - black ashy silty sand topsoil filling with trace gravel		D	0.0		PID = <1					
		SAND - brown sand			0.3		PID = <1					
					0.4							
				D								
	1.4	SAND - grey sand			1.0							
				D	1.6		PID = <2					
					2.1							
	2.5	Pit discontinued at 2.5m - target depth reached										
	3											
	4											
	5											
	6											
	7											
	8											
	9											

RIG: Backhoe

LOGGED: NSA

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	WL	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: Australian Jockey Club
PROJECT: Contamination Assessment
LOCATION: Randwick Stable Precinct,
 Randwick Racecourse, Randwick

SURFACE LEVEL: --
EASTING: 336681.8
NORTHING: 6246174.2
DIP/AZIMUTH: 90°/-

PIT No: TP107
PROJECT No: 71976.01
DATE: 23/8/2010
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.4	TOPSOIL - black ashy silty sand topsoil with some rootlets and trace gravel and trace brick fragments		D	0.0		PID = <1					
	0.7	FILLING - black ash filling with some gravel and trace brick fragments		D	0.3		PID = <2					
				D	0.4							
				D	0.6							
		SAND - brown sand (possibly filling)		D	0.8		PID = <2					
1								1				
	1.4	SAND - grey sand			1.3		PID = <2					
				D	1.4							
2	2.0	SAND - brown sand			1.9							
				D	2.1		PID = <2					
				D	2.6							
3	3.0	Pit discontinued at 3.0m - target depth reached						3				
4								4				
5								5				
6								6				
7								7				
8								8				
9								9				

RIG: Backhoe

LOGGED: NSA

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test Is(50) (MPa)
		PL(D)	Point load diametral test Is(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)

TEST PIT LOG

CLIENT: Australian Jockey Club
PROJECT: Contamination Assessment
LOCATION: Randwick Stable Precinct,
 Randwick Racecourse, Randwick

SURFACE LEVEL: --
EASTING: 336648.7
NORTHING: 6246129.5
DIP/AZIMUTH: 90°/--

PIT No: TP108
PROJECT No: 71976.01
DATE: 23/8/2010
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.4	TOPSOIL - black ashy silty sand topsoil with trace charcoal, glass and terracotta fragments		D	0.0		PID = <1					
		FILLING - brown sand (possibly natural)			0.5							
				D	0.6		PID = <1					
1												
	1.2	SAND - grey sand			1.1							
				D	1.3		PID = <1					
				D	1.8							
2	2.0	SAND - yellow sand			2.0		PID = <1					
				D	2.5							
3	3.0	Pit discontinued at 3.0m - target depth reached										
4												
5												
6												
7												
8												
9												

RIG: Backhoe

LOGGED: NSA

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

REMARKS:

- ☐ Sand Penetrometer AS1289.6.3.3
☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A	Auger sample	G	Gas sample
B	Bulk sample	P	Piston sample
BLK	Block sample	U	Tube sample (x mm dia.)
C	Core drilling	W	Water sample
D	Disturbed sample	W	Water seep
E	Environmental sample	W	Water level
		PID	Photo ionisation detector (ppm)
		PL(A)	Point load axial test 1s(50) (MPa)
		PL(D)	Point load diametral test 1s(50) (MPa)
		pp	Pocket penetrometer (kPa)
		S	Standard penetration test
		V	Shear vane (kPa)



TEST PIT LOG

CLIENT: Australian Jockey Club
PROJECT: Contamination Assessment
LOCATION: Randwick Stable Precinct,
 Randwick Racecourse, Randwick

SURFACE LEVEL: --
EASTING: 336559.2
NORTHING: 6246037.7
DIP/AZIMUTH: 90°/--

PIT No: TP110
PROJECT No: 71976.01
DATE: 23/8/2010
SHEET 1 OF 1

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Dynamic Penetrometer Test (blows per mm)			
				Type	Depth	Sample	Results & Comments		5	10	15	20
	0.4	TOPSOIL - brown silty sand with some gravel, trace terracotta and brick fragments		D	0.0		PID = <1					
					0.3							
		FILLING - dark brown, silty sand with some shale and concrete boulders, trace PVC, trace charcoal and metal scraps		D	0.5		PID = <2					
					1.0							
					1.5		PID = <1					
					2.0							
	2.2	SAND - grey sand			2.4		PID = <1					
					2.9							
	3.0	SAND - brown sand			3.1		PID = <1					
					3.5							
	3.5	Pit discontinued at 3.5m - target depth reached										
	4											
	5											
	6											
	7											
	8											
	9											

RIG: Backhoe

LOGGED: NSA

SURVEY DATUM: MGA94 Zone 56

WATER OBSERVATIONS: No free groundwater observed

☐ Sand Penetrometer AS1289.6.3.3

REMARKS:

☐ Cone Penetrometer AS1289.6.3.2

SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK Block sample	U, Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)	
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	W Water seep	S Standard penetration test	
E Environmental sample	W Water level	V Shear vane (kPa)	

BOREHOLE LOG

CLIENT: Australian Jockey Club
PROJECT: Contamination Assessment
LOCATION: Randwick Stable Precinct,
 Randwick Racecourse, Randwick

SURFACE LEVEL: 31.04 AHD **BORE No:** BH5
EASTING: 336584.1 **PROJECT No:** 71976.01
NORTHING: 6246260.9 **DATE:** 20/8/2010
DIP/AZIMUTH: 90°/-- **SHEET 1 OF 1**

RL	Depth (m)	Description of Strata	Graphic Log	Sampling & In Situ Testing				Water	Well Construction Details
				Type	Depth	Sample	Results & Comments		
31	0.3	TOPSOIL - brown silty sand with trace rootlets		A	0.0		PID = <1		Gatic cover
		SAND - white sand			0.3				Backfill
				A	0.6		PID = <1		
30	1.1	SAND - yellow sand		A*	1.0		PID = <1		Bentonite
					1.1				
				A	1.5		PID = <1		
					1.6				
29	2.1	SAND - yellow mottled orange sand		A	2.0		PID = <1		2 Backfilled with gravel
					2.1		PID = <2		
				A	2.5				
					2.6		PID = <1		
				A	3.0				
28	3.3	SAND - grey coarse grained sand, moist			3.4		PID = <2		Machine slotted PVC screen
		- saturated at 3.6m		A	3.9				
					4.0		PID = <1		
				A	4.5				
27					5.5		PID = <2		End cap
26	6.0	Bore discontinued at 6.0m		A	6.0				
		- target depth reached							
25									
24									
23									
22									

RIG: Bobcat

DRILLER: Steve Gregor

LOGGED: NSA

SURVEY DATUM: MGA94 Zone 56

TYPE OF BORING: Solid flight auger

CASING: Uncased

WATER OBSERVATIONS: Free groundwater observed at 3.6m

REMARKS: *Denotes field replicate samples BD2/200810 and BD2A/200810 collected at 1.1-1.5m

SAMPLING & IN SITU TESTING LEGEND			
A Auger sample	G Gas sample	PID Photo ionisation detector (ppm)	
B Bulk sample	P Piston sample	PL(A) Point load axial test Is(50) (MPa)	
BLK Block sample	U Tube sample (x mm dia.)	PL(D) Point load diametral test Is(50) (MPa)	
C Core drilling	W Water sample	pp Pocket penetrometer (kPa)	
D Disturbed sample	W Water seep	S Standard penetration test	
E Environmental sample	W Water level	V Shear vane (kPa)	



Appendix E

Laboratory Reports

Project Name: Randwick, Spectator and Stable Precincts – Contam Asses To: SGS Australia Pty Ltd
 Project No: 71976.01 Sampler:NSA.....
 Project Mgr: Lidsay Rockett.....Mob. Phone: 0409 773 636 (Nizam)
 Email: nizam.ahamed@douglaspartners.com.au.....@douglaspartners.com.au
 Date Required: STD Turn around..... Lab Quote No. Phone: 02 8594 0400 Fax: 02 99872151

Sample ID	Sample Depth	Lab ID	Sampling Date	Sample Type	Container		Analytes														PH	Notes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	BTEX/TPH	OCPS/OPPs	PCBs	PAH	Phenols	VOCs	Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
BH1/0.3-0.6	0.3-0.6	1			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Lab Report No. SE30829

Send Results to: Douglas Partners Address: 96 Hermitage Road, West Ryde 2114 Phone: (02) 9809 0666

Relinquished by: Nizam Signed: [Signature] Date & Time: 25/8 8:30 Received By: [Signature] Date & Time: 25/8/10 1046

Relinquished by: Signed: Date & Time: Received By: Date & Time:

Project Name: Randwick, Spectator and Stable Precincts – Contam AssesTo: SGS Australia Pty Ltd
Project No: 71976.01..... Sampler:NSA.....
Project Mgr: Lidsay Rockett.....Mob. Phone: 0409 773 636.....
Email: nizam.ahamed@douglaspartners.com.au.....@douglaspartners.com.au
Date Required: STD Turn around..... Lab Quote No.

Unit 16, Maddox Street, Alexandria
Attn: Simon Mathews
Phone: 02 8594 0400 Fax: 02 99872151

Sample ID	Sample Depth	Lab ID	Sampling Date	Sample Type	Container	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	BTX	TPH	OCPs	PCBs	PAH	Phenols	VOCs	Other	Notes
TP101	0-0.3	13				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP102	0-0.3	14				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP102	0.4-0.8	15				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP110	0-0.2	16				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP110	0.5-1.0	17				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP110	1.5-2.0	18				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP109	0-0.3	19				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP109	0.4-1.1	20				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP108	0-0.3	21				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP108	0.4-1.1	22				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP107	0.4-0.8	23				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP107	0.8-1.3	24				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	

Lab Report No. 3550334

Phone: (02) 9809 0666

Send Results to: Douglas Partners Address: 96 Hermitage Road, West Ryde 2114

Fax: (02) 9809 4095

Relinquished by: Nizam Signed: [Signature]

Received By: [Signature]

Date & Time: 25/8 8:30

Date & Time: 25/8/10 10:45 am

Relinquished by: Signed:

Date & Time:

Date & Time:

CHAIN OF CUSTODY

Project Name: Randwick, Spectator and Stable Precincts – Contam AssesTo: SGS Australia Pty Ltd
 Project No: 71976.01..... Sampler:NSA.....
 Project Mgr: Lidsay Rockett.....Mob. Phone: 0409 773 636.....
 Email: nizam.ahamed@douglaspartners.com.au.....@douglaspartners.com.au
 Date Required: STD Turn around..... Lab Quote No. Phone: 02 8594 0400 Fax: 02 99872151

Sample ID	Sample Depth	Lab ID	Sampling Date	Sample Type	Container Type	As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	BTEX/TPH	OCPS	PCBs	PAH	Phenols	VOCs	Other	Notes
TP106	0-0.3	25				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP106	0.4-1.0	26				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP105	0.3-0.6	27				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP105	1-1.5	28				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP104	0-0.2	29				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP104	0.3-0.8	30				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP104	1-1.6	31				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP103	0-0.3	32				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP103	0.4-0.9	33				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
TP107	0-0.3	34				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
BD4/230610		35				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	→ PLEASE FORWARD INTERLAB SAMPLE TO LABMARK.

Lab Report No. **SGS0889**

Phone: (02) 9809 0666

Send Results to: Douglas Partners Address: 96 Hermitage Road, West Ryde 2114

Fax: (02) 9809 4095

Relinquished by: Nizam Signed: *[Signature]*

Date & Time: 25/8 8:30 Received By: *[Signature]*

Date & Time: 25/2/10 10:41 am

Relinquished by: Signed:

Date & Time:

Received By:

Date & Time:

Project Name: Randwick, Spectator and Stable Precincts – Contam Asses To: SGS Australia Pty Ltd
 Project No: 71976.01 Sampler:NSA.....
 Project Mgr: Lidsay Rockett.....Mob, Phone: 0409 773 636.....
 Email: nizam.ahamed@douglaspartners.com.au.....@douglaspartners.com.au
 Date Required: STD Turn around..... Lab Quote No. Phone: 02 8594 0400 Fax: 02 99872151

Sample ID	Sample Depth	Lab ID	Sampling Date	Sample Type S - soil W - water	Container Type		Analytes										Notes																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	BTEX/TPH	OCPPs/OPPs	PCBs	PAH		Phenols	VOCs	Other																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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Lab Report No. 580889 Phone: (02) 9809 0666
 Send Results to: Douglas Partners Address: 96 Hermitage Road, West Ryde 2114 Fax: (02) 9809 4095
 Relinquished by: Nizam Signed: Date & Time: 25/8/02 8:30 Received By: CP Date & Time: 25/8/02 10:45am
 Relinquished by: Signed: Date & Time: Received By: Date & Time:











Accreditation No. 1545

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.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS**FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION**

Laboratory Report No: E049886
Client Name: Douglas Partners
Client Reference: Randwick, Spectator and Stable Precincts
Contact Name: Lindsay Rockett
Chain of Custody No: na
Sample Matrix: SOIL

Cover Page 1 of 3
 plus Sample Results

Date Received: 26/08/2010
 Date Reported: 14/09/2010

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 occurred 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 0-30% (>10xEQL), 0-75% (5-10xEQL)
 RPD (metals): 0-100% (<5xEQL)
 duplicate lab 0-50% (>10xEQL), 0-75% (5-10xEQL)
 RPD: 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	

Laura Schofield
Quality Control (Report signatory)
 laura.schofield@labmark.com.au

Laura Schofield
Authorising Chemist (NATA signatory)
 laura.schofield@labmark.com.au

Ryan Hamilton
Authorising Chemist (NATA signatory)
 ryan.hamilton@labmark.com.au

This document is issued in accordance with NATA's accreditation requirements.

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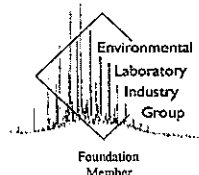
mgt LabMark Environmental Laboratories ABN 50 005 085 521

* SYDNEY: Unit 1, 8 Leighton Place Asquith NSW 2077

* MELBOURNE: 1868 Dandenong Road, Clayton VIC 3168

* Telephone: (02) 9476 6533 * Fax: (02) 9476 8219

* Telephone: (03) 9265 9300 * Fax: (03) 9538 2278



Laboratory Report: E049886

Cover Page 2 of 3

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

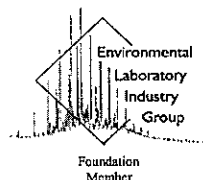
- A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.
- B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.
- C. Laboratory QA/QC samples are specific to this project.
- 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 mgt LabMark Environmental Melbourne, NATA accreditation No. 1645.



Laboratory Report: E049886

Cover Page 3 of 3

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

Matrix: SOIL

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	Volatile TPH by P&T (vTPH)	1	0	0%	0	0	0%
2	Petroleum Hydrocarbons (TPH)	1	0	0%	0	0	0%
3	Acid extractable metals - mercury	1	0	0%	0	0	0%
4	Acid extractable metals	1	0	0%	0	0	0%
5	Analysis by MGT LabMark	1	0	0%	0	0	0%
6	Moisture	1	--	--	--	--	--

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%).

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

- A. All tests were conducted by LabMark Environmental Sydney, NATA accreditation No. 13542, unless indicated below.
- B. Report reissued with amendments made to metals results

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.



ENVIRONMENTAL LABORATORIES

Laboratory Report No: E049886

Client Name: Douglas Partners

Contact Name: Lindsay Rockett

Client Reference: Randwick, Spectator and Stable Precincts
71976.01

Page: 1 of 5

plus cover page

Date: 14/09/10

Final

Certificate
of Analysis

This report supercedes reports issued on: 06/09/10

Laboratory Identification		275900	lcs	mb						
Sample Identification		BD4/23081 0	QC	QC						
Depth (m)		--	--	--						
Sampling Date recorded on COC		23/8/10	--	--						
Laboratory Extraction (Preparation) Date		27/8/10	27/8/10	27/8/10						
Laboratory Analysis Date		30/8/10	27/8/10	27/8/10						
Method : E029.2/E016.2 Volatile TPH by P&T (vTPH) C6 - C9 Fraction		EQL 10	115%	<10						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E029.2/E016.2: 8-10g soil extracted with 20ml methanol. Analysis by P&T/GC/FID/MSD.

Laboratory Report No: E049886
Client Name: Douglas Partners
Contact Name: Lindsay Rockett
Client Reference: Randwick, Spectator and Stable Precincts
71976.01

Page: 2 of 5
plus cover page
Date: 14/09/10
Final
Certificate
of Analysis
This report supercedes reports issued on: 06/09/10

Laboratory Identification		275900	les	mb						
Sample Identification		BD4/23081	QC	QC						
Depth (m)		--	--	--						
Sampling Date recorded on COC		23/8/10	--	--						
Laboratory Extraction (Preparation) Date		27/8/10	27/8/10	27/8/10						
Laboratory Analysis Date		28/8/10	28/8/10	28/8/10						
Method : E006.2										
Petroleum Hydrocarbons (TPH)		EQL								
C10 - C14 Fraction		50	--	<50						
C15 - C28 Fraction		100	98%	<100						
C29 - C36 Fraction		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.



ENVIRONMENTAL LABORATORIES

Laboratory Report No: E049886

Client Name: Douglas Partners

Contact Name: Lindsay Rockett

Client Reference: Randwick, Spectator and Stable Precincts
71976.01

Page: 3 of 5
plus cover page
Date: 14/09/10

Final
Certificate
of Analysis

This report supersedes reports issued on: 06/09/10

Laboratory Identification		275900	crm	ics	mb				
Sample Identification		BD4/23081 0	QC	QC	QC				
Depth (m)		--	--	--	--				
Sampling Date recorded on COC		23/8/10	--	--	--				
Laboratory Extraction (Preparation) Date		27/8/10	27/8/10	27/8/10	27/8/10				
Laboratory Analysis Date		3/9/10	27/8/10	27/8/10	27/8/10				
Method : E026.2 Acid extractable metals - mercury	EQL 0.05	<0.05	87%	93%	<0.05				
Mercury									

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E026.2: 0.5g digested with nitric/hydrochloric acid. Analysis by CV-ICP-MS or FIMS.



ENVIRONMENTAL LABORATORIES

Laboratory Report No: E049886

Client Name: Douglas Partners

Contact Name: Lindsay Rockett

Client Reference: Randwick, Spectator and Stable Precincts
71976.01

Page: 4 of 5
plus cover page
Date: 14/09/10

Final
Certificate
of Analysis

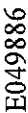
This report supercedes reports issued on: 06/09/10

Laboratory Identification		275900	lcs	mb						
Sample Identification		BD4/23081 0	QC	QC						
Depth (m)		--	--	--						
Sampling Date recorded on COC		23/8/10								
Laboratory Extraction (Preparation) Date		27/8/10	27/8/10	27/8/10						
Laboratory Analysis Date		31/8/10	30/8/10	30/8/10						
Method : E020.2/E030.2										
Acid extractable metals		EQL								
Arsenic		1	107%	<1						
Cadmium		0.1	98%	<0.1						
Chromium		1	102%	<1						
Copper		2	93%	<2						
Lead		2	105%	<2						
Nickel		1	99%	<1						
Zinc		5	110%	<5						

Results expressed in mg/kg dry weight unless otherwise specified

Comments:

E020.2/E030.2: 0.5g digested with nitric/hydrochloric acid . Analysis by AAS and/or ICP-OES.



Sample Receipt Notice (SRN) for E049886



Quality, Service, Support

Client Details

Client Name: Douglas Partners
Client Phone: 02 9809 0666
Client Fax: 02 98094095
Contact Name: Lindsay Rockett
Contact Email: rockett@douglaspartners.com.au
Client Address: 96 Hermitage Road
West Ryde NSW 2114

Project Name: Randwick, Spectator and Stable Precincts
Project Number: 71976.01
CoC Serial Number: - Not provided -
Purchase Order: - Not provided -
Surcharge: No surcharge applied (results by 6:30pm on due date)
Sample Matrix: SOIL

Date Sampled (earliest date): 23/08/2010
Date Samples Received: 26/08/2010
Date Sample Receipt Notice issued: 27/08/2010
Date Preliminary Report Due: 06/09/2010
Client TAT Request Date: 06/09/2010

Laboratory Reference Information

Please have this information ready when contacting MGT Labmark.

Laboratory Report: E049886
Quotation Number: - Not provided, standard prices apply
Laboratory Address: Unit 1, 8 Leighton Pl.
Asquith NSW 2077

Phone: 61 2 9476 6533
Fax: 61 2 9476 8219

Sample Receipt Contact: Leanne Knowles
Email: leanne.knowles@labmark.com.au
Reporting Contact: Leanne Knowles
Email: leanne.knowles@labmark.com.au

NATA Accreditation: 13542
AQIS Approval: NO356 (Sydney)
AQIS Entry Permit: 200521534 (Sydney)

Reporting Requirements: Electronic Data Download required: No

Invoice Number: 10EA11215

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
 Samples received in good order.
 Samples received with cooling media: Crushed ice.
 Samples received chilled.
 Security seals not used.
 Sample container & chemical preservation suitable.

Comments: Hg subcontracted to MGT Labmark Melbourne - results may be delayed | TPH as C6-C36 unless otherwise instructed

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:

MGT LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of \$1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur \$5.00/ sample/ 3 months. Additional refrigerated storage shall incur \$30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from MGT LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Reported by MGT LabMark Environmental Melbourne, NATA accreditation No. 1645.

Thank you for choosing MGT Labmark to analyse your project samples.
 Additional information on www.mgtlabmark.com.au

Sample Receipt Notice (SRN) for E049886



Quality, Service, Support

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE				Requested Analysis															
No.	Date	Depth	Client Sample ID	Acid extractable metals - mercury	Acid extractable metals	Moisture	PREP Not Reported	Petroleum Hydrocarbons (TPH)	Volatile TPH by P&T (VTPH)	External Analysis by MGT LabMark									
275900	23/08		BD4/230810	●	●	●	●	●	●	●									
Totals:				1	1	1	1	1	1	1									

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing MGT Labmark to analyse your project samples.
Additional information on www.mgtlabmark.com.au

Sample
Receipt
Notice (SRN) for **E049886**



Quality, Service, Support

				Requested Analysis															
No.	Date	Depth	Client Sample ID	M7 - MET-AAS_S	HG-T_S Mercury														
275900	23/08		BD4/230810	●	●														
Totals:				1	1														

Thank you for choosing MGT Labmark to analyse your project samples.
Additional information on www.mgtlabmark.com.au

Project Name: Randwick, Spectator and Stable Precincts – Contam Assessment To: SGS Australia Pty Ltd
 Project No: 71976.01..... Sampler:NSA.....
 Project Mgr: Lidsay Rockett..... Mob. Phone: 0409 773 636.....
 Email: nizam.ahamed@douglaspartners.com.au..... @douglaspartners.com.au
 Date Required: STD Turn around..... Lab Quote No.
 Phone: 02 8594 0400 Fax: 02 99872151

Sample ID	Sample Depth	Lab ID	Sampling Date	Sample Type	Container			Analytes											Notes				
					As	Cd	Cr	Cu	Pb	Hg	Ni	Zn	BTEX/TPH	OCs/OPs	PCBs	PAH	Phenols	VOCs		Other			
TP106/	0-0.3	25																					
TP106/	0.4-1.0	26																					
TP105/	0.3-0.6	27																					
TP105/	1-1.5	28																					
TP104/	0-0.2	29																					
TP104/	0.3-0.8	30																					
TP104/	1-1.6	31																					
TP103/	0-0.3	32																					
TP103/	0.4-0.9	33																					
TP107/	0-0.3	34	6/6/10	S - soil																			
BDA/	230810	35	275900	W - water																			
→ PLEASE FORWARD INTERLAB SAMPLE TO LABMARK.																							

Lab Report No. 2049886

Send Results to: Douglas Partners Address: 96 Hermitage Road, West Ryde 2114

Relinquished by: Nizam Signed: [Signature]

Relinquished by: Signed:

Date & Time: 25/8 3:30 Received By: CIP

Date & Time:

Phone: (02) 9809 0666

Fax: (02) 9809 4095

Date & Time: 25/8/10 10:41 am

**LabMark****ENVIRONMENTAL LABORATORIES**

Accreditation No. 1645

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.

CUSTOMER CENTRIC - ANALYTICAL CHEMISTS**FINAL CERTIFICATE OF ANALYSIS - ENVIRONMENTAL DIVISION**

Laboratory Report No: E050032
Client Name: Douglas Partners
Client Reference: Randwick, Spec and Stable Precinct Contam
Contact Name: Lindsay Rockett
Chain of Custody No: na
Sample Matrix: WATER

Cover Page 1 of 3
 plus Sample Results

Date Received: 07/09/2010
 Date Reported: 15/09/2010

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 occurred 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 general analytes 70% - 130% recovery
 surrogate: 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 0-30% (>10xEQL), 0-75% (5-10xEQL)
 RPD (metals): 0-100% (<5xEQL)
 duplicate lab 0-50% (>10xEQL), 0-75% (5-10xEQL)
 RPD: 0-100% (<5xEQL)

QUALITY CONTROL**ANALYTE SPECIFIC ACCEPTANCE CRITERIA (ASAC)**

Accuracy: spike, lcs, crm analyte specific recovery data
 surrogate: <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	

Laura Schofield
Quality Control (Report signatory)
 laura.schofield@labmark.com.au

Laura Schofield
Authorising Chemist (NATA signatory)
 laura.schofield@labmark.com.au

Ryan Hamilton
Authorising Chemist (NATA signatory)
 ryan.hamilton@labmark.com.au

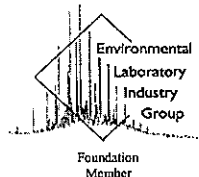
This document is issued in accordance with NATA's accreditation requirements.

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mgt LabMark Environmental Laboratories ABN 50 005 085 521

* SYDNEY: Unit 1, 8 Leighton Place Asquith NSW 2077
 * Telephone: (02) 9476 6533 * Fax: (02) 9476 8219

* MELBOURNE: 1868 Dandenong Road, Clayton VIC 3168
 * Telephone: (03) 9265 9300 * Fax: (03) 3265 2278



Laboratory Report: E050032

Cover Page 2 of 3

NEPC GUIDELINE COMPLIANCE - DQO

1. GENERAL

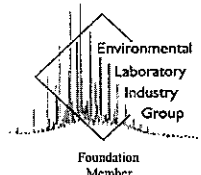
- A. Results relate specifically to samples as received. Sample results are not corrected for matrix spike, lcs, or surrogate recovery data.
- B. EQL's are matrix dependant and may be increased due to sample dilution or matrix interference.
- C. Laboratory QA/QC samples are specific to this project.
- 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 traceable 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. 1645.
- C. Subcontracted analyses: Refer to Sample Receipt Notice and additional DQO comments.
Reported by mgt LabMark Environmental Melbourne, NATA accreditation No. 1645.



Laboratory Report: E050032

Cover Page 3 of 3

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

Matrix: WATER

Page:	Method:	Totals:	#d	%d-ratio	#t	#s	%s-ratio
1	Polyaromatic Hydrocarbons (PAH)	1	0	0%	0	0	0%
2	Filtered mercury	1	0	0%	0	0	0%

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%).

5. ADDITIONAL COMMENTS SPECIFIC TO THIS REPORT

- A. All tests were conducted by mgt LabMark Environmental Sydney, NATA accreditation No. 13542, unless indicated below.
- B. The following test was conducted by mgt LabMark Environmental Melbourne, NATA accreditation No. 1645. :- Metals. Please see attached report.

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.



ENVIRONMENTAL LABORATORIES

Laboratory Report No: E050032

Client Name: Douglas Partners

Contact Name: Lindsay Rockett

Client Reference: Randwick, Spec and Stable Precinct

Contam 71976.01

Page: 1 of 2
plus cover page
Date: 15/09/10

Final
Certificate
of Analysis

This report supercedes reports issued on: N/A

Laboratory Identification		277132	ies	mb					
Sample Identification		BD2/030910	QC	QC					
Depth (m)		--	--	--					
Sampling Date recorded on COC		3/9/10							
Laboratory Extraction (Preparation) Date		9/9/10	9/9/10	9/9/10					
Laboratory Analysis Date		10/9/10	10/9/10	10/9/10					
Method : E007.1									
Polyaromatic Hydrocarbons (PAH)		EQ							
Naphthalene		1	80%	<1					
Acenaphthylene		1	104%	<1					
Acenaphthene		1	74%	<1					
Fluorene		1	76%	<1					
Phenanthrene		1	78%	<1					
Anthracene		1	85%	<1					
Fluoranthene		1	79%	<1					
Pyrene		1	76%	<1					
Benz(a)anthracene		1	81%	<1					
Chrysene		1	76%	<1					
Benzo(b)&(k)fluoranthene		2	74%	<2					
Benzo(a) pyrene		1	94%	<1					
Indeno(1,2,3-c,d)pyrene		1	80%	<1					
Dibenz(a,h)anthracene		1	77%	<1					
Benzo(g,h,i)perylene		1	93%	<1					
Sum of reported PAHs		--	--	--					
2-FBP (Surr @ 250ug/l)		--	75%	78%					
TP-d14 (Surr @ 250ug/l)		--	80%	80%					

Results expressed in ug/l unless otherwise specified

Comments:

E007.1: Triple extraction with DCM. Analysis by GC/MS.



ENVIRONMENTAL LABORATORIES

Laboratory Report No: E050032

Client Name: Douglas Partners

Contact Name: Lindsay Rockett

Client Reference: Randwick, Spec and Stable Precinct
Contam 71976.01

Page: 2 of 2
plus cover page
Date: 15/09/10

Final
Certificate
of Analysis

This report supersedes reports issued on: N/A

Laboratory Identification		277132	ics	mb					
Sample Identification		BD2/03091	QC	QC					
Depth (m)		--	--	--					
Sampling Date recorded on COC		3/9/10	--	--					
Laboratory Extraction (Preparation) Date		9/9/10	9/9/10	9/9/10					
Laboratory Analysis Date		10/9/10	10/9/10	10/9/10					
Method : E026.1 Filtered mercury Mercury		EQL 0.1	94%	<0.1					

Results expressed in ug/l unless otherwise specified

Comments:

E026.1: Analysis by CV-ICP-MS or FIMS following BrCl pre-treatment.

Certificate of Analysis

mgt-LabMark
Unit 1/8 Leighton Place
Asquith
NSW 2077

NATA Accredited
Laboratory Number 1645



The tests covered by this document have been performed in accordance with NATA and ISO/IEC 17025 and are traceable to national standards of measurement.
This document shall not be reproduced, except in full.

Attention: Ryan Hamilton

Project 276075
Client Reference E050032 DOUGLAS_SY
Received Date Sep 09, 2010

Client Sample ID			BD2/030910
Sample Matrix			Water
mgt-Labmark Sample No.			10-Se21395
Date Sampled			Sep 03, 2010
Test/Reference	PQL	Unit	
Metals (7) filtered			
Arsenic (filtered)	0.005	mg/L	< 0.005
Cadmium (filtered)	0.0002	mg/L	< 0.0002
Chromium (filtered)	0.005	mg/L	< 0.005
Copper (filtered)	0.005	mg/L	< 0.005
Lead (filtered)	0.005	mg/L	< 0.005
Nickel (filtered)	0.005	mg/L	< 0.005
Zinc (filtered)	0.005	mg/L	0.009

Sample History

Where samples are submitted/analysed over several days, the last date of extraction and analysis is reported.

Description	Testing Site	Extracted	Analysed
Metals (7) filtered - Method: LM-LTM-MET-3100	Clayton	Sep 09, 2010	Sep 10, 2010

mgt-Labmark Internal Quality Control Review

General

1. Laboratory QC results for Method Blanks, Duplicates, Matrix Spikes, and Laboratory Control Samples are included in this QC report where applicable. Additional QC data may be available on request.
2. All soil results are reported on a dry basis, unless otherwise stated.
3. Actual PQLs are matrix dependant. Quoted PQLs may be raised where sample extracts are diluted due to interferences.
4. Result are uncorrected for matrix spikes or surrogate recoveries.
5. SVOC analysis on water are performed on homogenized, unfiltered sample, unless noted otherwise.
6. Samples were analysed on an as received basis.
7. This report replaces any interim results previously issued.

Holding Times

Please refer to 'Sampling and Preservation Chart for Soils & Waters' for holding times. (LM-FOR-ADM-020)

For samples received on the last day of holding time, notification of testing requirements should have been received at least 6 hours prior to sample receipt deadlines as stated on the Sample Receipt Acknowledgment.

If the Laboratory did not receive the information in the required timeframe, and regardless of any other integrity issues, suitability qualified results may still be reported.

Holding times apply from the date of sampling, therefore compliance to these may be outside the laboratory's control.

****NOTE:** pH duplicates are reported as a range NOT as an RPD

UNITS

mg/kg: milligrams per Kilogram	mg/l: milligrams per litre
ug/l: micrograms per litre	ppm: Parts per million
ppb: Parts per billion	%: Percentage
org/100ml: Organisms per 100 millilitres	NTU: Units

TERMS

Dry:	Where a moisture has been determined on a solid sample the result is expressed on a dry basis.
LOR:	Limit of Reporting.
SPIKE:	Addition of the analyte to the sample and reported as percentage recovery.
RPD:	Relative Percent Difference between two Duplicate pieces of analysis.
LCS:	Laboratory Control Sample - reported as percent recovery.
CRM:	Certified Reference Material - reported as percent recovery.
Method Blank:	In the case of solid samples these are performed on laboratory certified clean sands. In the case of water samples these are performed on de-ionised water.
Surr - Surrogate:	The addition of a like compound to the analyte target and reported as percentage recovery.
Duplicate:	A second piece of analysis from the same sample and reported in the same units as the result to show comparison.
Batch Duplicate:	A second piece of analysis from a sample outside of the clients batch of samples but run within the laboratory batch of analysis.
Batch SPIKE:	Spike recovery reported on a sample from outside of the clients batch of samples but run within the laboratory batch of analysis.
USEPA:	United States Environment Protection Authority
APHA:	American Public Health Association
ASLP:	Australian Standard Leaching Procedure (AS4439.3)
TCLP:	Toxicity Characteristic Leaching Procedure
COC:	Chain of Custody
SRA:	Sample Receipt Advice

QC - ACCEPTANCE CRITERIA

RPD Duplicates: Global RPD Duplicates Acceptance Criteria is 30% however the following acceptance guidelines are equally applicable:

Results <10 times the LOR : No Limit

Results between 10-20 times LOR : RPD must lie between 0-50%

Results >20 times LOR : RPD must lie between 0-20%

Surrogate Recoveries : Recoveries must lie between 50-150% - Phenols 20-130%.

QC DATA GENERAL COMMENTS

1. Where a result is reported as a less than (<), higher than the nominated LOR this is due to either Matrix Interference, extract dilution required due to interferences or contaminant levels within the sample, high moisture content or insufficient sample provided.
2. Duplicate data shown within this report that states the word "BATCH" is a Batch Duplicate from outside of your sample batch, but within the laboratory sample batch a 1:10 ratio. The Parent and Duplicate data shown is not data from your samples.
3. Organochlorine Pesticide analysis - where reporting LCS data, Toxaphene & Chlordane are not added to the LCS.
4. Organochlorine Pesticide analysis - where reporting Spike data, Toxaphene is not added to the Spike.
5. Total Recoverable Hydrocarbons - where reporting Spike & LCS data, a single spike of commercial Hydrocarbon products in the range of C12-C30 is added and it's Total Recovery is reported in the C10-C14 cell of the Report.
6. Recovery Data (Spikes & Surrogates) - where chromatographic interference does not allow the determination of Recovery the term "INT" appears against that analyte.
7. Polychlorinated Biphenyls are spiked only using Arochlor 1260 in Matrix Spikes and LCS's.
8. For Matrix Spikes and LCS results a dash "-" in the report means that the specific analyte was not added to the QC sample.
9. Duplicate RPD's are calculated from raw analytical data thus it is possible to have two sets of data below the LOR with a positive RPD
- eg: LOR 0.1, Result A = <0.1 (raw data is 0.02) & Result B = <0.1 (raw data is 0.03) resulting in a RPD of 40% calculated from the raw data.

Quality Control Results

Sample, Test, Result Reference	Units	Result 1			Acceptance Limits	Pass Limits	Qualifying Codes
Method Blank							
Metals (7) filtered LM-LTM-MET-3100							
Arsenic (filtered)	mg/L	< 0.005			0.005	Pass	
Cadmium (filtered)	mg/L	< 0.0002			0.0002	Pass	
Chromium (filtered)	mg/L	< 0.005			0.005	Pass	
Copper (filtered)	mg/L	< 0.005			0.005	Pass	
Lead (filtered)	mg/L	< 0.005			0.005	Pass	
Nickel (filtered)	mg/L	< 0.005			0.005	Pass	
Zinc (filtered)	mg/L	< 0.005			0.005	Pass	
LCS - % Recovery							
Metals (7) filtered LM-LTM-MET-3100							
		Result 1					
Arsenic (filtered)	%	95			70-130	Pass	
Cadmium (filtered)	%	98			70-130	Pass	
Chromium (filtered)	%	93			70-130	Pass	
Copper (filtered)	%	95			70-130	Pass	
Lead (filtered)	%	94			70-130	Pass	
Nickel (filtered)	%	94			70-130	Pass	
Zinc (filtered)	%	94			70-130	Pass	
[Duplicate of 10-Se21423 - BATCH]							
Metals (7) filtered							
		Result 1	Result 2	RPD			
Arsenic (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Cadmium (filtered)	mg/L	< 0.0002	< 0.0002	<1	30%	Pass	
Chromium (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Copper (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Lead (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Nickel (filtered)	mg/L	< 0.005	< 0.005	<1	30%	Pass	
Zinc (filtered)	mg/L	0.013	0.013	1.0	30%	Pass	
[Spike of 10-Se21395] - % Recovery							
Metals (7) filtered							
		Result 1					
Arsenic (filtered)	%	98			70 - 130	Pass	
Cadmium (filtered)	%	107			70 - 130	Pass	
Chromium (filtered)	%	95			70 - 130	Pass	
Copper (filtered)	%	98			70 - 130	Pass	
Lead (filtered)	%	98			70 - 130	Pass	
Nickel (filtered)	%	97			70 - 130	Pass	
Zinc (filtered)	%	106			70 - 130	Pass	

Comments

Sample Integrity

Custody Seals Intact (if used)	N/A
Attempt to Chill was evident	Yes
Sample correctly preserved	Yes
Organic samples had Teflon liners	Yes
Samples received with Zero Headspace	Yes
Samples received within HoldingTime	Yes
Some samples have been subcontracted	No

Authorised By



Glenn Jackson
NATA Signatory

Final report - this Report replaces any previously issued Report

- Indicates Not Requested

* Indicates NATA accreditation does not cover the performance of this service

mgt-Labmark shall not be liable for loss, cost, damages or expenses incurred by the client, or any other person or company, resulting from the use of any information or interpretation given in this report. In no case shall mgt-Labmark be liable for consequential damages including, but not limited to, lost profits, damages for failure to meet deadlines and lost production arising from this report. This document shall not be reproduced except in full and relates only to the items tested. Unless indicated otherwise, the tests were performed on the samples as received.

Sample Receipt Notice (SRN) for E050032



Quality, Service, Support

Client Details

Laboratory Reference Information

Client Name: Douglas Partners
Client Phone: 02 9809 0666
Client Fax: 02 98094095
Contact Name: Lindsay Rockett
Contact Email: rockettll@douglaspartners.com.au
Client Address: 96 Hermitage Road
West Ryde NSW 2114

Project Name: Randwick, Spec and Stable Precinct Contam
Project Number: 71976.01
CoC Serial Number: - Not provided -
Purchase Order: - Not provided -
Surcharge: No surcharge applied (results by 6:30pm on due date)
Sample Matrix: WATER

Date Sampled (earliest date): 03/09/2010
Date Samples Received: 07/09/2010
Date Sample Receipt Notice issued: 07/09/2010
Date Preliminary Report Due: 16/09/2010
Client TAT Request Date: 16/09/2010

Please have this information ready when contacting MGT Labmark.

Laboratory Report: **E050032**
Quotation Number: - Not provided, standard prices apply
Laboratory Address: Unit 1, 8 Leighton Pl.
Asquith NSW 2077
Phone: 61 2 9476 6533
Fax: 61 2 9476 8219
Sample Receipt Contact: Leanne Knowles
Email: leanne.knowles@labmark.com.au
Reporting Contact: Leanne Knowles
Email: leanne.knowles@labmark.com.au

NATA Accreditation: 13542
AQIS Approval: NO356 (Sydney)
AQIS Entry Permit: 200521534 (Sydney)

Reporting Requirements: Electronic Data Download required: No

Invoice Number: 10EA11362

Sample Condition: COC received with samples. Report number and lab ID's defined on COC.
Samples received in good order .
Samples received with cooling media: Ice bricks .
Samples received chilled.
Security seals not used .
Sample container & chemical preservation suitable .

Comments: Metals - As, Cd, Cr, Cu, Pb, Ni, Zn (Dissolved to reflect sample preservation) by MGT Labmark
Melbourne - results may be delayed

Holding Times: Date received allows for sufficient time to meet Technical Holding Times.

Preservation: Chemical preservation of samples satisfactory for requested analytes.

Important Notes:

MGT LabMark shall responsibly dispose of spent customer soil and water samples which includes the disintegration of the sample label. A sample disposal fee of \$1.00 is applicable on all samples received by the laboratory regardless of whether they have undergone analytical testing. Sample disposal of environmental samples shall be 31 days (water) and 3 months (soil, HN03 preserved samples) after laboratory receipt, unless otherwise requested in writing by the client. Samples requested to be held in non-refrigerated storage shall incur \$5.00/ sample/ 3 months. Additional refrigerated storage shall incur \$30/ sample/ 3 months. Combination prices apply only if requested. Transfer of report ownership from MGT LabMark to the client shall occur once full and final payment has been settled and verified. All report copies may be retracted where full payment does not occur within the agreed settlement period.

Analysis comments:

Subcontracted Analyses:

Reported by MGT LabMark Environmental Melbourne, NATA accreditation No. 1645.

Thank you for choosing MGT Labmark to analyse your project samples.

Additional information on www.mgtlabmark.com.au

Sample Receipt Notice (SRN) for E050032



Quality, Service, Support

The table below represents LabMark's understanding and interpretation of the customer supplied sample COC request (refer to SRN comments section on first page for external subcontracting method details). Please confirm that your COC request has been entered correctly. Due to THT and TAT requirements, testing shall commence immediately as per this table, unless the customer intervenes with a correction prior to testing.

GRID REVIEW TABLE				Requested Analysis														
No.	Date	Depth	Client Sample ID	Filtered mercury	Filtered metals (M7)	Polyaromatic Hydrocarbons (PAH)	PREP Not Reported	External Analysis by MGT LabMark										
277132	03/09		B102/030910	●	●	●	●	●										
Totals:				1	1	1	1	1										

'PREP Not Reported' refers to an internal laboratory instruction - client confirmation of this parameter is not required.

Thank you for choosing MGT Labmark to analyse your project samples.
Additional information on www.mgtlabmark.com.au

Sample
Receipt
Notice (SRN) for **E050032**



Quality, Service, Support

				Requested Analysis															
No.	Date	Depth	Client Sample ID	M8 - M7-F_W															
277132	03/09		BD2/030910	●															
Totals:				1															

Thank you for choosing MGT Labmark to analyse your project samples.
Additional information on www.mgtlabmark.com.au



ANALYTICAL REPORT

1 September 2010

Douglas Partners Pty Ltd
96 Hermitage Road
WEST RYDE
NSW 2114

Attention: Nizam Ahamed

Your Reference: 71976-01 - Randwick-Spectator and Stable Precincts

Our Reference: SE80889

Samples: 54 Soils

Received: 25/08/2010

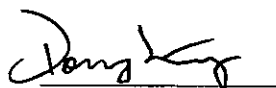
Preliminary Report Sent: 31/08/10

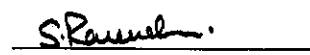
These samples were analysed in accordance with your written instructions.

For and on Behalf of:
SGS ENVIRONMENTAL SERVICES

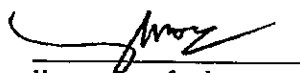
Sample Receipt:	Angela Mamalicos	AU.SampleReceipt.Sydney@sgs.com
Production Manager:	Huong Crawford	Huong.Crawford@sgs.com

Results Approved and/or Authorised by:


Dong Liang
Quality Manager


Ravee Sivasubramaniam
Asbestos Signatory


Ly Kim Ha
Organics Signatory


Huong Crawford
Metals Signatory



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NATA accredited laboratory 2562 (4354).
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Page 1 of 60

WORLD RECOGNISED
ACCREDITATION

SGS Australia Pty Ltd
ABN 44 000 964 278

Environmental Services Unit 16/33 Maddox Street Alexandria NSW 2015 Australia
t +61 (0)2 8594 0400 f + 61 (0)2 8594 0499 www.au.sgs.com

MBTEX in Soil Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-1 BH1/ 0.3-0.5 Soil	SE80889-2 BH2/ 0.3-0.6 Soil	SE80889-3 BH2/ 0.7-1.0 Soil	SE80889-4 BH2/ 4.1-4.5 Soil	SE80889-5 BH3/ 0.3-0.6 Soil
Date Extracted (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	73	66	71	68	67

MBTEX in Soil Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-6 BH4/ 0.4-0.6 Soil	SE80889-7 BH5/ 0-0.3 Soil	SE80889-8 BH5/ 3.4-3.9 Soil	SE80889-9 BH6/ 0.3-0.6 Soil	SE80889-10 BH6/ 0.6-1.0 Soil
Date Extracted (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	72	64	70	60	69

MBTEX in Soil Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-13 TP101/ 0-0.3 Soil	SE80889-14 TP102/ 0-0.3 Soil	SE80889-15 TP102/ 0.4-0.8 Soil	SE80889-16 TP110/ 0-0.3 Soil	SE80889-17 TP110/ 0.5-1.0 Soil
Date Extracted (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	64	65	61	63	76



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MBTEX in Soil Our Reference:	UNITS	SE80889-1 8	SE80889-1 9	SE80889-2 0	SE80889-2 1	SE80889-2 2
Your Reference	-----	TP110/ 1.5-2.0	TP109/ 0-0.3	TP109/ 0.6-1.1	TP108/ 0-0.3	TP108/ 0.6-1.1
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	90	87	76	70	72

MBTEX in Soil Our Reference:	UNITS	SE80889-2 3	SE80889-2 4	SE80889-2 5	SE80889-2 6	SE80889-2 7
Your Reference	-----	TP107/ 0.4-0.6	TP107/ 0.8-1.3	TP106/ 0-0.3	TP106/ 0.4-1.0	TP105/ 0.3-0.6
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	65	66	73	73	67

MBTEX in Soil Our Reference:	UNITS	SE80889-2 8	SE80889-2 9	SE80889-3 0	SE80889-3 1	SE80889-3 2
Your Reference	-----	TP105/ 1-1.5	TP104/ 0-0.2	TP104/ 0.3-0.8	TP104/ 1-1.6	TP103/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	70	62	74	60	71



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MBTEX in Soil Our Reference:	UNITS	SE80889-3 3	SE80889-3 4	SE80889-5 1	SE80889-5 3
Your Reference	-----	TP103/ 0.4-0.9	TP107/ 0-0.3	TB1/ 200810	TB/ 230810
Sample Matrix	-----	Soil	Soil	Soil	Soil
Date Extracted (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (MBTEX)		27/08/2010	27/08/2010	27/08/2010	27/08/2010
Benzene	mg/kg	<0.1	<0.1	<0.1	<0.1
Toluene	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	mg/kg	<0.1	<0.1	<0.1	<0.1
Total Xylenes	mg/kg	<0.3	<0.3	<0.3	<0.3
BTEX Surrogate (%)	%	76	63	66	81



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BTEX in Soil Our Reference:	UNITS	SE80889-5 2	SE80889-5 4
Your Reference	-----	TS/ 200810	TS/ 230810
Sample Matrix	-----	Soil	Soil
Date Extracted (BTEX)		27/08/2010	27/08/2010
Date Analysed (BTEX)		27/08/2010	27/08/2010
Benzene	mg/kg	60%	90%
Toluene	mg/kg	66%	83%
Ethylbenzene	mg/kg	84%	84%
Total Xylenes	mg/kg	84%	86%
BTEX Surrogate (%)	%	70	100



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TRH in soil with C6-C9 by P/T	UNITS	SE80889-1	SE80889-2	SE80889-3	SE80889-4	SE80889-5
Our Reference:	-----	BH1/ 0.3-0.5	BH2/ 0.3-0.6	BH2/ 0.7-1.0	BH2/ 4.1-4.5	BH3/ 0.3-0.6
Your Reference	-----					
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	<50	<50	<50	<50	<50
TRH C29 - C36	mg/kg	<50	<50	<50	<50	<50

TRH in soil with C6-C9 by P/T	UNITS	SE80889-6	SE80889-7	SE80889-8	SE80889-9	SE80889-10
Our Reference:	-----	BH4/ 0.4-0.6	BH5/ 0-0.3	BH5/ 3.4-3.9	BH6/ 0.3-0.6	BH6/ 0.6-1.0
Your Reference	-----					
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	<50	<50	<50	<50	<50
TRH C29 - C36	mg/kg	<50	<50	<50	<50	<50

TRH in soil with C6-C9 by P/T	UNITS	SE80889-11	SE80889-12	SE80889-13	SE80889-14	SE80889-15
Our Reference:	-----	BD1/ 200810	BD3/ 200810	TP101/ 0-0.3	TP102/ 0-0.3	TP102/ 0.4-0.8
Your Reference	-----					
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	<50	<50	120	61	<50
TRH C29 - C36	mg/kg	<50	<50	62	<50	<50



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TRH in soil with C6-C9 by P/T						
Our Reference:	UNITS	SE80889-1	SE80889-1	SE80889-1	SE80889-1	SE80889-2
		6	7	8	9	0
Your Reference	-----	TP110/	TP110/	TP110/	TP109/	TP109/
		0-0.3	0.5-1.0	1.5-2.0	0-0.3	0.6-1.1
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	<50	<50	62	160	460
TRH C29 - C36	mg/kg	57	<50	<50	140	370

TRH in soil with C6-C9 by P/T						
Our Reference:	UNITS	SE80889-2	SE80889-2	SE80889-2	SE80889-2	SE80889-2
		1	2	3	4	5
Your Reference	-----	TP108/	TP108/	TP107/	TP107/	TP106/
		0-0.3	0.6-1.1	0.4-0.6	0.8-1.3	0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	<50	79	<50	<50	<50
TRH C29 - C36	mg/kg	<50	<50	<50	<50	<50

TRH in soil with C6-C9 by P/T						
Our Reference:	UNITS	SE80889-2	SE80889-2	SE80889-2	SE80889-2	SE80889-3
		6	7	8	9	0
Your Reference	-----	TP106/	TP105/	TP105/	TP104/	TP104/
		0.4-1.0	0.3-0.6	1-1.5	0-0.2	0.3-0.8
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	150	<50	<50	<50	<50
TRH C29 - C36	mg/kg	85	<50	<50	<50	<50



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TRH in soil with C6-C9 by P/T						
Our Reference:	UNITS	SE80889-3	SE80889-3	SE80889-3	SE80889-3	SE80889-5
		1	2	3	4	1
Your Reference	-----	TP104/	TP103/	TP103/	TP107/	TB1/
		1-1.6	0-0.3	0.4-0.9	0-0.3	200810
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C6-C9 PT)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C6 - C9 P&T	mg/kg	<20	<20	<20	<20	<20
Date Extracted (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (TRH C10-C36)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
TRH C10 - C14	mg/kg	<20	<20	<20	<20	<20
TRH C15 - C28	mg/kg	<50	<50	<50	<50	<50
TRH C29 - C36	mg/kg	<50	<50	<50	<50	<50

TRH in soil with C6-C9 by P/T		
Our Reference:	UNITS	SE80889-5
		3
Your Reference	-----	TB/ 230810
Sample Matrix	-----	Soil
Date Extracted (TRH C6-C9 PT)		27/08/2010
Date Analysed (TRH C6-C9 PT)		27/08/2010
TRH C6 - C9 P&T	mg/kg	<20
Date Extracted (TRH C10-C36)		27/08/2010
Date Analysed (TRH C10-C36)		27/08/2010
TRH C10 - C14	mg/kg	<20
TRH C15 - C28	mg/kg	<50
TRH C29 - C36	mg/kg	<50



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PAHs in Soil Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-1 BH1/ 0.3-0.5 Soil	SE80889-2 BH2/ 0.3-0.6 Soil	SE80889-3 BH2/ 0.7-1.0 Soil	SE80889-4 BH2/ 4.1-4.5 Soil	SE80889-5 BH3/ 0.3-0.6 Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Naphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
1-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	0.10	<0.10	<0.10	0.10
Pyrene	mg/kg	<0.10	0.10	<0.10	<0.10	0.10
Benzo[a]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Chrysene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[b,k]fluoranthene	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Benzo[a]pyrene	mg/kg	<0.05	0.07	<0.05	<0.05	0.07
Indeno[123-cd]pyrene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Total PAHs (sum)	mg/kg	<1.7	<1.77	<1.7	<1.7	<1.77
Nitrobenzene-d5	%	94	93	93	90	92
2-Fluorobiphenyl	%	94	92	89	88	92
p -Terphenyl-d14	%	76	87	84	86	64



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PAHs in Soil Our Reference:	UNITS	SE80889-6	SE80889-7	SE80889-8	SE80889-9	SE80889-10
Your Reference	-----	BH4/ 0.4-0.6	BH5/ 0-0.3	BH5/ 3.4-3.9	BH6/ 0.3-0.6	BH6/ 0.6-1.0
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Naphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
1-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	0.34	<0.10	<0.10	<0.10
Anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	0.50	<0.10	<0.10	<0.10
Pyrene	mg/kg	<0.10	0.54	<0.10	0.11	<0.10
Benzo[a]anthracene	mg/kg	<0.10	0.34	<0.10	<0.10	<0.10
Chrysene	mg/kg	<0.10	0.28	<0.10	<0.10	<0.10
Benzo[b,k]fluoranthene	mg/kg	<0.20	0.52	<0.20	<0.20	<0.20
Benzo[a]pyrene	mg/kg	<0.05	0.30	<0.05	0.10	<0.05
Indeno[123-cd]pyrene	mg/kg	<0.10	0.15	<0.10	<0.10	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	0.13	<0.10	<0.10	<0.10
Total PAHs (sum)	mg/kg	<1.7	<3.90	<1.7	<1.81	<1.7
Nitrobenzene-d5	%	92	92	83	90	96
2-Fluorobiphenyl	%	94	92	80	90	92
p -Terphenyl-d14	%	74	72	80	72	87



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PAHs in Soil Our Reference:	UNITS	SE80889-1 3	SE80889-1 4	SE80889-1 5	SE80889-1 6	SE80889-1 7
Your Reference	-----	TP101/ 0-0.3	TP102/ 0-0.3	TP102/ 0.4-0.8	TP110/ 0-0.3	TP110/ 0.5-1.0
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Naphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
1-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	0.43	0.23	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	0.19	0.11	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	4.6	2.0	0.33	<0.10	0.32
Anthracene	mg/kg	0.93	0.43	0.11	<0.10	<0.10
Fluoranthene	mg/kg	8.2	2.5	1.1	0.59	1.1
Pyrene	mg/kg	8.4	1.9	1.1	0.64	1.2
Benzo[a]anthracene	mg/kg	5.0	1.2	0.62	0.34	0.79
Chrysene	mg/kg	3.5	1.0	0.54	0.32	0.71
Benzo[b,k]fluoranthene	mg/kg	5.7	1.6	1.1	0.74	1.5
Benzo[a]pyrene	mg/kg	3.6	1.0	0.66	0.43	0.87
Indeno[123-cd]pyrene	mg/kg	1.5	0.47	0.34	0.25	0.54
Dibenzo[ah]anthracene	mg/kg	0.30	<0.10	<0.10	<0.10	0.11
Benzo[ghi]perylene	mg/kg	1.2	0.39	0.46	0.23	0.46
Total PAHs (sum)	mg/kg	<44.04	<13.44	<7.14	<4.44	<8.35
Nitrobenzene-d5	%	106	88	89	96	96
2-Fluorobiphenyl	%	106	90	87	96	90
p -Terphenyl-d14	%	88	62	82	72	82



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PAHs in Soil Our Reference:	UNITS	SE80889-1 8	SE80889-1 9	SE80889-2 0	SE80889-2 1	SE80889-2 2
Your Reference	-----	TP110/ 1.5-2.0	TP109/ 0-0.3	TP109/ 0.6-1.1	TP108/ 0-0.3	TP108/ 0.6-1.1
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Naphthalene	mg/kg	<0.10	0.17	0.12	<0.10	0.15
2-Methylnaphthalene	mg/kg	<0.10	0.12	<0.10	<0.10	<0.10
1-Methylnaphthalene	mg/kg	<0.10	0.13	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	0.29	0.95	1.4	<0.10	1.2
Acenaphthene	mg/kg	<0.10	<0.10	0.20	<0.10	<0.10
Fluorene	mg/kg	<0.10	0.47	0.39	<0.10	0.19
Phenanthrene	mg/kg	0.65	4.0	5.9	0.61	3.0
Anthracene	mg/kg	0.34	1.2	2.2	0.14	0.97
Fluoranthene	mg/kg	2.6	6.0	17	1.2	7.2
Pyrene	mg/kg	2.8	5.6	17	1.2	6.7
Benzo[a]anthracene	mg/kg	1.7	3.2	13	0.64	4.2
Chrysene	mg/kg	1.6	2.6	10	0.43	3.3
Benzo[b,k]fluoranthene	mg/kg	3.7	5.6	18	0.79	7.2
Benzo[a]pyrene	mg/kg	2.3	3.1	11	0.40	4.1
Indeno[123-cd]pyrene	mg/kg	1.4	2.0	6.4	0.19	2.5
Dibenzo[ah]anthracene	mg/kg	0.24	0.37	1.6	<0.10	0.63
Benzo[ghi]perylene	mg/kg	2.0	2.4	7.8	0.14	2.8
Total PAHs (sum)	mg/kg	<20.06	<38.08	<112.34	<6.47	<44.37
Nitrobenzene-d5	%	89	87	94	90	90
2-Fluorobiphenyl	%	88	85	91	92	87
<i>p</i> -Terphenyl-d14	%	85	82	85	80	85



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PAHs in Soil Our Reference:	UNITS	SE80889-2 3	SE80889-2 4	SE80889-2 5	SE80889-2 6	SE80889-2 7
Your Reference	-----	TP107/ 0.4-0.6	TP107/ 0.8-1.3	TP106/ 0-0.3	TP106/ 0.4-1.0	TP105/ 0.3-0.6
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Naphthalene	mg/kg	0.10	<0.10	<0.10	0.27	<0.10
2-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
1-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	0.26	<0.10	<0.10	1.8	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	0.24	<0.10	<0.10	0.53	<0.10
Phenanthrene	mg/kg	2.5	<0.10	0.23	6.2	<0.10
Anthracene	mg/kg	0.54	<0.10	<0.10	1.9	<0.10
Fluoranthene	mg/kg	2.6	<0.10	0.56	12	<0.10
Pyrene	mg/kg	2.4	<0.10	0.55	11	<0.10
Benzo[a]anthracene	mg/kg	1.2	<0.10	0.32	6.1	<0.10
Chrysene	mg/kg	0.88	<0.10	0.29	4.6	<0.10
Benzo[b,k]fluoranthene	mg/kg	1.2	<0.20	0.42	10	<0.20
Benzo[a]pyrene	mg/kg	0.60	<0.05	0.18	5.9	<0.05
Indeno[123-cd]pyrene	mg/kg	0.23	<0.10	<0.10	3.4	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	<0.10	<0.10	0.82	<0.10
Benzo[ghi]perylene	mg/kg	0.16	<0.10	<0.10	3.8	<0.10
Total PAHs (sum)	mg/kg	<13.21	<1.7	<3.55	<68.14	<1.7
Nitrobenzene-d5	%	94	100	94	88	90
2-Fluorobiphenyl	%	88	95	88	88	96
p -Terphenyl-d14	%	74	92	78	85	76



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PAHs in Soil Our Reference:	UNITS	SE80889-2 8	SE80889-2 9	SE80889-3 0	SE80889-3 1	SE80889-3 2
Your Reference	-----	TP105/ 1-1.5	TP104/ 0-0.2	TP104/ 0.3-0.8	TP104/ 1-1.6	TP103/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Naphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
2-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
1-Methylnaphthalene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	0.21	<0.10	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	1.2	0.10	<0.10	0.15
Anthracene	mg/kg	<0.10	0.36	<0.10	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	2.2	0.30	<0.10	<0.10
Pyrene	mg/kg	<0.10	2.4	0.31	<0.10	<0.10
Benzo[a]anthracene	mg/kg	<0.10	1.2	0.17	<0.10	<0.10
Chrysene	mg/kg	<0.10	1.1	0.16	<0.10	<0.10
Benzo[b,k]fluoranthene	mg/kg	<0.20	2.0	0.41	<0.20	<0.20
Benzo[a]pyrene	mg/kg	<0.05	1.2	0.21	<0.05	0.05
Indeno[123-cd]pyrene	mg/kg	<0.10	0.57	0.13	<0.10	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	0.11	<0.10	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	0.48	0.18	<0.10	<0.10
Total PAHs (sum)	mg/kg	<1.7	<13.54	<2.77	<1.7	<1.80
Nitrobenzene-d5	%	99	92	98	94	94
2-Fluorobiphenyl	%	97	98	95	91	100
p -Terphenyl-d14	%	89	70	87	84	74



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PAHs in Soil Our Reference:	UNITS	SE80889-3 3	SE80889-3 4
Your Reference	-----	TP103/ 0.4-0.9	TP107/ 0-0.3
Sample Matrix	-----	Soil	Soil
Date Extracted		27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010
Naphthalene	mg/kg	<0.10	<0.10
2-Methylnaphthalene	mg/kg	<0.10	<0.10
1-Methylnaphthalene	mg/kg	<0.10	<0.10
Acenaphthylene	mg/kg	<0.10	<0.10
Acenaphthene	mg/kg	<0.10	<0.10
Fluorene	mg/kg	<0.10	<0.10
Phenanthrene	mg/kg	<0.10	<0.10
Anthracene	mg/kg	<0.10	<0.10
Fluoranthene	mg/kg	<0.10	<0.10
Pyrene	mg/kg	<0.10	<0.10
Benzo[a]anthracene	mg/kg	<0.10	<0.10
Chrysene	mg/kg	<0.10	<0.10
Benzo[b,k]fluoranthene	mg/kg	<0.20	<0.20
Benzo[a]pyrene	mg/kg	<0.05	0.05
Indeno[123-cd]pyrene	mg/kg	<0.10	<0.10
Dibenzo[ah]anthracene	mg/kg	<0.10	<0.10
Benzo[ghi]perylene	mg/kg	<0.10	<0.10
Total PAHs (sum)	mg/kg	<1.7	<1.7
Nitrobenzene-d5	%	93	90
2-Fluorobiphenyl	%	89	96
p -Terphenyl-d14	%	85	70



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OC Pesticides in Soil Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-1 BH1/ 0.3-0.5 Soil	SE80889-5 BH3/ 0.3-0.6 Soil	SE80889-6 BH4/ 0.4-0.6 Soil	SE80889-7 BH5/ 0-0.3 Soil	SE80889-9 BH6/ 0.3-0.6 Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>alpha</i> -BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC (Lindane)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>beta</i> -BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>delta</i> -BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>o,p</i> -DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>alpha</i> -Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>trans</i> -Chlordane (<i>gamma</i>)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>cis</i> -Chlordane (<i>alpha</i>)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>trans</i> -Nonachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>p,p</i> -DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>o,p</i> -DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>o,p</i> -DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>beta</i> -Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>p,p</i> -DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>p,p</i> -DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5,6-Tetrachloro-m-xylene (<i>Surrogate</i>)	%	101	99	100	102	85



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OC Pesticides in Soil Our Reference:	UNITS	SE80889-1 3	SE80889-1 4	SE80889-1 6	SE80889-1 7	SE80889-2 1
Your Reference	-----	TP101/ 0-0.3	TP102/ 0-0.3	TP110/ 0-0.3	TP110/ 0.5-1.0	TP108/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>alpha</i> -BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC (Lindane)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>beta</i> -BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>delta</i> -BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>o,p</i> -DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>alpha</i> -Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>trans</i> -Chlordane (<i>gamma</i>)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>cis</i> -Chlordane (<i>alpha</i>)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>trans</i> -Nonachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>p,p</i> -DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>o,p</i> -DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>o,p</i> -DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>beta</i> -Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>p,p</i> -DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>p,p</i> -DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5,6-Tetrachloro-m-xylene (<i>Surrogate</i>)	%	106	109	107	109	106



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OC Pesticides in Soil Our Reference:	UNITS	SE80889-2 3	SE80889-2 5	SE80889-2 7	SE80889-2 9	SE80889-3 2
Your Reference	-----	TP107/ 0.4-0.6	TP106/ 0-0.3	TP105/ 0.3-0.6	TP104/ 0-0.2	TP103/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>alpha</i> -BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>gamma</i> -BHC (Lindane)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>beta</i> -BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>delta</i> -BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>o,p</i> -DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>alpha</i> -Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>trans</i> -Chlordane (<i>gamma</i>)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>cis</i> -Chlordane (<i>alpha</i>)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>trans</i> -Nonachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>p,p</i> -DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>o,p</i> -DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>o,p</i> -DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>beta</i> -Endosulfan	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>p,p</i> -DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
<i>p,p</i> -DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Ketone	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,5,6-Tetrachloro-m-xylene (<i>Surrogate</i>)	%	101	88	97	97	99



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OC Pesticides in Soil		
Our Reference:	UNITS	SE80889-3
Your Reference	-----	4
Sample Matrix	-----	TP107/ 0-0.3 Soil
Date Extracted		27/08/2010
Date Analysed		27/08/2010
HCB	mg/kg	<0.1
<i>alpha</i> -BHC	mg/kg	<0.1
gamma-BHC (Lindane)	mg/kg	<0.1
Heptachlor	mg/kg	<0.1
Aldrin	mg/kg	<0.1
<i>beta</i> -BHC	mg/kg	<0.1
<i>delta</i> -BHC	mg/kg	<0.1
Heptachlor Epoxide	mg/kg	<0.1
<i>o,p</i> -DDE	mg/kg	<0.1
<i>alpha</i> -Endosulfan	mg/kg	<0.1
<i>trans</i> -Chlordane (<i>gamma</i>)	mg/kg	<0.1
<i>cis</i> -Chlordane (<i>alpha</i>)	mg/kg	<0.1
<i>trans</i> -Nonachlor	mg/kg	<0.1
<i>p,p</i> -DDE	mg/kg	<0.1
Dieldrin	mg/kg	<0.1
Endrin	mg/kg	<0.1
<i>o,p</i> -DDD	mg/kg	<0.1
<i>o,p</i> -DDT	mg/kg	<0.1
<i>beta</i> -Endosulfan	mg/kg	<0.1
<i>p,p</i> -DDD	mg/kg	<0.1
<i>p,p</i> -DDT	mg/kg	<0.1
Endosulfan Sulphate	mg/kg	<0.1
Endrin Aldehyde	mg/kg	<0.1
Methoxychlor	mg/kg	<0.1
Endrin Ketone	mg/kg	<0.1
2,4,5,6-Tetrachloro-m-xylene (<i>Surrogate</i>)	%	104



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OP Pesticides in Soil by GCMS Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-1 BH1/ 0.3-0.5 Soil	SE80889-5 BH3/ 0.3-0.6 Soil	SE80889-6 BH4/ 0.4-0.6 Soil	SE80889-7 BH5/ 0-0.3 Soil	SE80889-9 BH6/ 0.3-0.6 Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Dichlorvos	mg/kg	<1	<1	<1	<1	<1
Dimethoate	mg/kg	<1	<1	<1	<1	<1
Diazinon	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	94	92	94	92	90
d14-p-Terphenyl (Surr)	%	76	64	74	72	72

OP Pesticides in Soil by GCMS Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-1 3 TP101/ 0-0.3 Soil	SE80889-1 4 TP102/ 0-0.3 Soil	SE80889-1 6 TP110/ 0-0.3 Soil	SE80889-1 7 TP110/ 0.5-1.0 Soil	SE80889-2 1 TP108/ 0-0.3 Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Dichlorvos	mg/kg	<1	<1	<1	<1	<1
Dimethoate	mg/kg	<1	<1	<1	<1	<1
Diazinon	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	106	90	96	90	92
d14-p-Terphenyl (Surr)	%	88	62	72	82	80



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OP Pesticides in Soil by GCMS						
Our Reference:	UNITS	SE80889-2	SE80889-2	SE80889-2	SE80889-2	SE80889-3
Your Reference	-----	3	5	7	9	2
Sample Matrix	-----	TP107/ 0.4-0.6	TP106/ 0-0.3	TP105/ 0.3-0.6	TP104/ 0-0.2	TP103/ 0-0.3
		Soil	Soil	Soil	Soil	Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Dichlorvos	mg/kg	<1	<1	<1	<1	<1
Dimethoate	mg/kg	<1	<1	<1	<1	<1
Diazinon	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Fenitrothion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Malathion	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Parathion-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Bromofos-ethyl	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Methidathion	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethion	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Azinphos-methyl	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20
2-fluorobiphenyl (Surr)	%	88	88	96	98	100
d14-p-Terphenyl (Surr)	%	74	78	76	70	74

OP Pesticides in Soil by GCMS		
Our Reference:	UNITS	SE80889-3
Your Reference	-----	4
Sample Matrix	-----	TP107/ 0-0.3
		Soil
Date Extracted		27/08/2010
Date Analysed		27/08/2010
Dichlorvos	mg/kg	<1
Dimethoate	mg/kg	<1
Diazinon	mg/kg	<0.5
Fenitrothion	mg/kg	<0.2
Malathion	mg/kg	<0.20
Chlorpyrifos-ethyl	mg/kg	<0.2
Parathion-ethyl	mg/kg	<0.2
Bromofos-ethyl	mg/kg	<0.2
Methidathion	mg/kg	<0.5
Ethion	mg/kg	<0.2
Azinphos-methyl	mg/kg	<0.20
2-fluorobiphenyl (Surr)	%	96
d14-p-Terphenyl (Surr)	%	70



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PCBs in Soil Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-1 BH1/ 0.3-0.5 Soil	SE80889-5 BH3/ 0.3-0.6 Soil	SE80889-6 BH4/ 0.4-0.6 Soil	SE80889-7 BH5/ 0-0.3 Soil	SE80889-9 BH6/ 0.3-0.6 Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1262	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1268	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive PCB	mg/kg	<0.90	<0.90	<0.90	<0.90	<0.90
PCB_Surrogate 1	%	101	99	100	102	85

PCBs in Soil Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-1 3 TP101/ 0-0.3 Soil	SE80889-1 4 TP102/ 0-0.3 Soil	SE80889-1 6 TP110/ 0-0.3 Soil	SE80889-1 7 TP110/ 0.5-1.0 Soil	SE80889-2 1 TP108/ 0-0.3 Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1262	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1268	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive PCB	mg/kg	<0.90	<0.90	<0.90	<0.90	<0.90
PCB_Surrogate 1	%	106	109	107	109	106



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PCBs in Soil Our Reference:	UNITS	SE80889-2 3	SE80889-2 5	SE80889-2 7	SE80889-2 9	SE80889-3 2
Your Reference	-----	TP107/ 0.4-0.6	TP106/ 0-0.3	TP105/ 0.3-0.6	TP104/ 0-0.2	TP103/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Arochlor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1262	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Arochlor 1268	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total Positive PCB	mg/kg	<0.90	<0.90	<0.90	<0.90	<0.90
PCB_Surrogate 1	%	101	88	97	97	99

PCBs in Soil Our Reference:	UNITS	SE80889-3 4
Your Reference	-----	TP107/ 0-0.3
Sample Matrix	-----	Soil
Date Extracted		27/08/2010
Date Analysed		27/08/2010
Arochlor 1016	mg/kg	<0.1
Arochlor 1221	mg/kg	<0.1
Arochlor 1232	mg/kg	<0.1
Arochlor 1242	mg/kg	<0.1
Arochlor 1248	mg/kg	<0.1
Arochlor 1254	mg/kg	<0.1
Arochlor 1260	mg/kg	<0.1
Arochlor 1262	mg/kg	<0.1
Arochlor 1268	mg/kg	<0.1
Total Positive PCB	mg/kg	<0.90
PCB_Surrogate 1	%	104



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Total Phenolics in Soil						
Our Reference:	UNITS	SE80889-1	SE80889-5	SE80889-6	SE80889-9	SE80889-13
Your Reference	-----	BH1/ 0.3-0.5	BH3/ 0.3-0.6	BH4/ 0.4-0.6	BH6/ 0.3-0.6	TP101/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Phenols)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Phenols)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Total Phenolics (as Phenol)	mg/kg	<0.1	<0.1	<0.1	<0.1	0.6

Total Phenolics in Soil						
Our Reference:	UNITS	SE80889-14	SE80889-16	SE80889-17	SE80889-21	SE80889-23
Your Reference	-----	TP102/ 0-0.3	TP110/ 0-0.3	TP110/ 0.5-1.0	TP108/ 0-0.3	TP107/ 0.4-0.6
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Phenols)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Phenols)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Total Phenolics (as Phenol)	mg/kg	<0.1	0.4	0.8	0.7	<0.1

Total Phenolics in Soil						
Our Reference:	UNITS	SE80889-25	SE80889-27	SE80889-29	SE80889-32	SE80889-34
Your Reference	-----	TP106/ 0-0.3	TP105/ 0.3-0.6	TP104/ 0-0.2	TP103/ 0-0.3	TP107/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Phenols)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Phenols)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Total Phenolics (as Phenol)	mg/kg	<0.1	<0.1	<0.1	<0.1	0.1



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Inorganics						
Our Reference:	UNITS	SE80889-2	SE80889-3	SE80889-7	SE80889-8	SE80889-3 6
Your Reference	-----	BH2/ 0.3-0.6	BH2/ 0.7-1.0	BH5/ 0-0.3	BH5/ 3.4-3.9	BH2/ 1.1-1.5
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted- (pH 1:5 soil: Water)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (pH 1:5 Soil: Water)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
pH 1:5 soil:water	pH Units	9.1	7.0	7.2	5.5	6.5
Date Extracted (Conductivity)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Conductivity)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Electrical Conductivity 1:5 soil:water	µS/cm	97	13	15	14	13

Inorganics						
Our Reference:	UNITS	SE80889-3 7	SE80889-3 8	SE80889-3 9	SE80889-4 0	SE80889-4 1
Your Reference	-----	BH2/ 1.6-2.0	BH2/ 2.1-2.5	BH2/ 2.6-3.0	BH2/ 3.1-3.5	BH2/ 3.6-4.0
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted- (pH 1:5 soil: Water)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (pH 1:5 Soil: Water)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
pH 1:5 soil:water	pH Units	7.0	7.9	7.1	7.4	7.3
Date Extracted (Conductivity)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Conductivity)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Electrical Conductivity 1:5 soil:water	µS/cm	18	27	77	40	38

Inorganics						
Our Reference:	UNITS	SE80889-4 2	SE80889-4 3	SE80889-4 4	SE80889-4 5	SE80889-4 6
Your Reference	-----	BH2/ 5.1-5.5	BH2/ 4.6-5.0	BH5/ 0.6-1.0	BH5/ 1.1-1.5	BH5/ 1.6-2.0
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted- (pH 1:5 soil: Water)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (pH 1:5 Soil: Water)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
pH 1:5 soil:water	pH Units	6.5	6.4	6.7	6.4	6.1
Date Extracted (Conductivity)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Conductivity)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Electrical Conductivity 1:5 soil:water	µS/cm	23	26	6.0	7.2	5.5



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Inorganics					
Our Reference:	UNITS	SE80889-4	SE80889-4	SE80889-4	SE80889-5
		7	8	9	0
Your Reference	-----	BH5/ 2.1-2.5	BH5/ 2.6-3.0	BH5/ 4-4.5	BH5/ 5.5-6.0
Sample Matrix	-----	Soil	Soil	Soil	Soil
Date Extracted- (pH 1:5 soil: Water)		27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (pH 1:5 Soil: Water)		27/08/2010	27/08/2010	27/08/2010	27/08/2010
pH 1:5 soil:water	pH Units	6.0	6.1	5.3	6.5
Date Extracted (Conductivity)		27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Conductivity)		27/08/2010	27/08/2010	27/08/2010	27/08/2010
Electrical Conductivity 1:5 soil:water	µS/cm	10	9.3	21	30



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Metals in Soil by ICP-OES Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-1 BH1/ 0.3-0.5 Soil	SE80889-2 BH2/ 0.3-0.6 Soil	SE80889-3 BH2/ 0.7-1.0 Soil	SE80889-4 BH2/ 4.1-4.5 Soil	SE80889-5 BH3/ 0.3-0.6 Soil
Date Extracted (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Arsenic	mg/kg	<3	<3	<3	<3	<3
Cadmium	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium	mg/kg	2.7	3.8	<0.3	1.4	5.3
Copper	mg/kg	2.7	50	3.3	1.3	6.9
Lead	mg/kg	5	280	<1	<1	75
Nickel	mg/kg	1.2	1.5	<0.5	1.4	2.7
Zinc	mg/kg	16	92	15	3.3	33

Metals in Soil by ICP-OES Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-6 BH4/ 0.4-0.6 Soil	SE80889-7 BH5/ 0-0.3 Soil	SE80889-8 BH5/ 3.4-3.9 Soil	SE80889-9 BH6/ 0.3-0.6 Soil	SE80889-10 BH6/ 0.6-1.0 Soil
Date Extracted (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Arsenic	mg/kg	<3	<3	<3	<3	<3
Cadmium	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium	mg/kg	<0.3	1.1	1.1	3.9	<0.3
Copper	mg/kg	0.6	9.8	<0.5	5.2	1.3
Lead	mg/kg	<1	26	<1	8	<1
Nickel	mg/kg	<0.5	0.7	<0.5	1.3	<0.5
Zinc	mg/kg	0.91	9.1	0.6	8.9	2.0



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Metals in Soil by ICP-OES Our Reference:	UNITS	SE80889-1 1	SE80889-1 2	SE80889-1 3	SE80889-1 4	SE80889-1 5
Your Reference	-----	BD1/ 200810	BD3/ 200810	TP101/ 0-0.3	TP102/ 0-0.3	TP102/ 0.4-0.8
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Arsenic	mg/kg	<3	<3	4	<3	<3
Cadmium	mg/kg	<0.3	<0.3	0.4	<0.3	<0.3
Chromium	mg/kg	1.8	<0.3	11	8.1	7.3
Copper	mg/kg	34	1.3	33	74	18
Lead	mg/kg	73	<1	69	71	120
Nickel	mg/kg	<0.5	<0.5	5.2	7.5	1.4
Zinc	mg/kg	58	2.2	75	83	94

Metals in Soil by ICP-OES Our Reference:	UNITS	SE80889-1 6	SE80889-1 7	SE80889-1 8	SE80889-1 9	SE80889-2 0
Your Reference	-----	TP110/ 0-0.3	TP110/ 0.5-1.0	TP110/ 1.5-2.0	TP109/ 0-0.3	TP109/ 0.6-1.1
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Arsenic	mg/kg	<3	4	4	8	5
Cadmium	mg/kg	<0.3	0.4	0.4	2.5	0.9
Chromium	mg/kg	4.5	5.4	5.0	19	7.3
Copper	mg/kg	26	19	28	180	76
Lead	mg/kg	110	62	140	1,500	300
Nickel	mg/kg	7.4	10	14	19	6.8
Zinc	mg/kg	98	78	170	1,100	390



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Metals in Soil by ICP-OES Our Reference:	UNITS	SE80889-2 1	SE80889-2 2	SE80889-2 3	SE80889-2 4	SE80889-2 5
Your Reference	-----	TP108/ 0-0.3	TP108/ 0.6-1.1	TP107/ 0.4-0.6	TP107/ 0.8-1.3	TP106/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Arsenic	mg/kg	<3	4	<3	<3	<3
Cadmium	mg/kg	0.4	<0.3	<0.3	<0.3	<0.3
Chromium	mg/kg	4.7	11	4.6	<0.3	6.6
Copper	mg/kg	23	59	25	1.2	33
Lead	mg/kg	72	120	41	2	47
Nickel	mg/kg	15	3.1	13	<0.5	22
Zinc	mg/kg	120	120	39	1.7	75

Metals in Soil by ICP-OES Our Reference:	UNITS	SE80889-2 6	SE80889-2 7	SE80889-2 8	SE80889-2 9	SE80889-3 0
Your Reference	-----	TP106/ 0.4-1.0	TP105/ 0.3-0.6	TP105/ 1-1.5	TP104/ 0-0.2	TP104/ 0.3-0.8
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Arsenic	mg/kg	4	<3	<3	<3	<3
Cadmium	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium	mg/kg	8.8	1.1	<0.3	3.0	3.8
Copper	mg/kg	43	6.3	<0.5	9.5	20
Lead	mg/kg	120	11	<1	30	44
Nickel	mg/kg	2.7	21	<0.5	7.0	12
Zinc	mg/kg	97	24	0.8	30	46



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Metals in Soil by ICP-OES Our Reference:	UNITS	SE80889-3 1	SE80889-3 2	SE80889-3 3	SE80889-3 4
Your Reference	-----	TP104/ 1-1.6	TP103/ 0-0.3	TP103/ 0.4-0.9	TP107/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil
Date Extracted (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Metals)		27/08/2010	27/08/2010	27/08/2010	27/08/2010
Arsenic	mg/kg	<3	<3	<3	<3
Cadmium	mg/kg	<0.3	<0.3	<0.3	<0.3
Chromium	mg/kg	<0.3	7.8	2.6	3.8
Copper	mg/kg	<0.5	34	0.6	17
Lead	mg/kg	<1	12	2	39
Nickel	mg/kg	<0.5	51	1.2	11
Zinc	mg/kg	<0.5	45	1.2	42



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Mercury Cold Vapor/Hg Analyser						
Our Reference:	UNITS	SE80889-1	SE80889-2	SE80889-3	SE80889-4	SE80889-5
Your Reference	-----	BH1/ 0.3-0.5	BH2/ 0.3-0.6	BH2/ 0.7-1.0	BH2/ 4.1-4.5	BH3/ 0.3-0.6
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Mercury	mg/kg	<0.05	0.22	<0.05	<0.05	0.24

Mercury Cold Vapor/Hg Analyser						
Our Reference:	UNITS	SE80889-6	SE80889-7	SE80889-8	SE80889-9	SE80889-10
Your Reference	-----	BH4/ 0.4-0.6	BH5/ 0-0.3	BH5/ 3.4-3.9	BH6/ 0.3-0.6	BH6/ 0.6-1.0
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Mercury	mg/kg	<0.05	0.07	<0.05	<0.05	<0.05

Mercury Cold Vapor/Hg Analyser						
Our Reference:	UNITS	SE80889-11	SE80889-12	SE80889-13	SE80889-14	SE80889-15
Your Reference	-----	BD1/ 200810	BD3/ 200810	TP101/ 0-0.3	TP102/ 0-0.3	TP102/ 0.4-0.8
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Mercury	mg/kg	0.10	<0.05	0.21	0.10	0.07

Mercury Cold Vapor/Hg Analyser						
Our Reference:	UNITS	SE80889-16	SE80889-17	SE80889-18	SE80889-19	SE80889-20
Your Reference	-----	TP110/ 0-0.3	TP110/ 0.5-1.0	TP110/ 1.5-2.0	TP109/ 0-0.3	TP109/ 0.6-1.1
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Mercury	mg/kg	0.08	0.07	<0.05	0.57	0.12



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Mercury Cold Vapor/Hg Analyser						
Our Reference:	UNITS	SE80889-2 1	SE80889-2 2	SE80889-2 3	SE80889-2 4	SE80889-2 5
Your Reference	-----	TP108/ 0-0.3	TP108/ 0.6-1.1	TP107/ 0.4-0.6	TP107/ 0.8-1.3	TP106/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Mercury	mg/kg	0.10	0.35	<0.05	<0.05	0.06

Mercury Cold Vapor/Hg Analyser						
Our Reference:	UNITS	SE80889-2 6	SE80889-2 7	SE80889-2 8	SE80889-2 9	SE80889-3 0
Your Reference	-----	TP106/ 0.4-1.0	TP105/ 0.3-0.6	TP105/ 1-1.5	TP104/ 0-0.2	TP104/ 0.3-0.8
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Extracted (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010	27/08/2010
Mercury	mg/kg	0.62	0.07	<0.05	0.06	<0.05

Mercury Cold Vapor/Hg Analyser					
Our Reference:	UNITS	SE80889-3 1	SE80889-3 2	SE80889-3 3	SE80889-3 4
Your Reference	-----	TP104/ 1-1.6	TP103/ 0-0.3	TP103/ 0.4-0.9	TP107/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil
Date Extracted (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010
Date Analysed (Mercury)		27/08/2010	27/08/2010	27/08/2010	27/08/2010
Mercury	mg/kg	<0.05	<0.05	<0.05	<0.05



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Asbestos ID in soil Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-1 BH1/ 0.3-0.5 Soil	SE80889-2 BH2/ 0.3-0.6 Soil	SE80889-5 BH3/ 0.3-0.6 Soil	SE80889-6 BH4/ 0.4-0.6 Soil	SE80889-7 BH5/ 0-0.3 Soil
Date Analysed		30/08/2010	1/09/2010	30/08/2010	30/08/2010	30/08/2010
Sample Description		167g sand, soil	120g Sand	207g sand, soil	172g sand	198g soil, sand
Asbestos ID in soil	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID in soil Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-9 BH6/ 0.3-0.6 Soil	SE80889-1 3 TP101/ 0-0.3 Soil	SE80889-1 4 TP102/ 0-0.3 Soil	SE80889-1 5 TP102/ 0.4-0.8 Soil	SE80889-1 6 TP110/ 0-0.3 Soil
Date Analysed		30/08/2010	30/08/2010	30/08/2010	30/08/2010	30/08/2010
Sample Description		274g sand, soil, rocks	186g sand, soil	215g sand, soil, rocks	189g sand, soil, rocks	145g sand, soil, rocks
Asbestos ID in soil	-	No asbestos detected Organic fibres detected*	No asbestos detected Organic fibres detected*	No asbestos detected	Chrysotile asbestos detected	No asbestos detected Organic fibres detected*

Asbestos ID in soil Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE80889-1 7 TP110/ 0.5-1.0 Soil	SE80889-1 8 TP110/ 1.5-2.0 Soil	SE80889-1 9 TP109/ 0-0.3 Soil	SE80889-2 1 TP108/ 0-0.3 Soil	SE80889-2 5 TP106/ 0-0.3 Soil
Date Analysed		30/08/2010	30/08/2010	30/08/2010	30/08/2010	30/08/2010
Sample Description		192g sand, soil, rocks	237g sand, soil, rocks	205g soil, plant matter	120g soil, rocks	95g soil, rocks
Asbestos ID in soil	-	No asbestos detected Organic fibres detected*	Chrysotile asbestos detected Amosite asbestos detected Crocidolite asbestos detected Organic fibres detected*	No asbestos detected Organic fibres detected*	No asbestos detected Organic fibres detected*	No asbestos detected Organic fibres detected*



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Asbestos ID in soil Our Reference:	UNITS	SE80889-2 7	SE80889-2 9	SE80889-3 0	SE80889-3 2	SE80889-3 4
Your Reference	-----	TP105/ 0.3-0.6	TP104/ 0-0.2	TP104/ 0.3-0.8	TP103/ 0-0.3	TP107/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed		30/08/2010	30/08/2010	30/08/2010	30/08/2010	30/08/2010
Sample Description		106g soil, rocks	237g soil, rocks	138g soil, rocks	189g soil, rocks	115g soil, rocks
Asbestos ID in soil	-	No asbestos detected Organic fibres detected*	No asbestos detected Organic fibres detected*	No asbestos detected Organic fibres detected*	No asbestos detected Organic fibres detected*	No asbestos detected Organic fibres detected*



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Moisture						
Our Reference:	UNITS	SE80889-1	SE80889-2	SE80889-3	SE80889-4	SE80889-5
Your Reference	-----	BH1/ 0.3-0.5	BH2/ 0.3-0.6	BH2/ 0.7-1.0	BH2/ 4.1-4.5	BH3/ 0.3-0.6
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed (moisture)		26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010
Moisture	%	6	6	5	19	5

Moisture						
Our Reference:	UNITS	SE80889-6	SE80889-7	SE80889-8	SE80889-9	SE80889-10
Your Reference	-----	BH4/ 0.4-0.6	BH5/ 0-0.3	BH5/ 3.4-3.9	BH6/ 0.3-0.6	BH6/ 0.6-1.0
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed (moisture)		26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010
Moisture	%	2	6	15	8	4

Moisture						
Our Reference:	UNITS	SE80889-11	SE80889-12	SE80889-13	SE80889-14	SE80889-15
Your Reference	-----	BD1/ 200810	BD3/ 200810	TP101/ 0-0.3	TP102/ 0-0.3	TP102/ 0.4-0.8
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed (moisture)		26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010
Moisture	%	6	4	10	9	6

Moisture						
Our Reference:	UNITS	SE80889-16	SE80889-17	SE80889-18	SE80889-19	SE80889-20
Your Reference	-----	TP110/ 0-0.3	TP110/ 0.5-1.0	TP110/ 1.5-2.0	TP109/ 0-0.3	TP109/ 0.6-1.1
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed (moisture)		26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010
Moisture	%	8	21	6	15	8

Moisture						
Our Reference:	UNITS	SE80889-21	SE80889-22	SE80889-23	SE80889-24	SE80889-25
Your Reference	-----	TP108/ 0-0.3	TP108/ 0.6-1.1	TP107/ 0.4-0.6	TP107/ 0.8-1.3	TP106/ 0-0.3
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed (moisture)		26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010
Moisture	%	23	10	24	4	15



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Moisture						
Our Reference:	UNITS	SE80889-2	SE80889-2	SE80889-2	SE80889-2	SE80889-3
		6	7	8	9	0
Your Reference	-----	TP106/ 0.4-1.0	TP105/ 0.3-0.6	TP105/ 1-1.5	TP104/ 0-0.2	TP104/ 0.3-0.8
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed (moisture)		26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010
Moisture	%	12	24	2	8	12

Moisture						
Our Reference:	UNITS	SE80889-3	SE80889-3	SE80889-3	SE80889-3	SE80889-3
		1	2	3	4	6
Your Reference	-----	TP104/ 1-1.6	TP103/ 0-0.3	TP103/ 0.4-0.9	TP107/ 0-0.3	BH2/ 1.1-1.5
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed (moisture)		26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010
Moisture	%	4	7	3	27	4

Moisture						
Our Reference:	UNITS	SE80889-3	SE80889-3	SE80889-3	SE80889-4	SE80889-4
		7	8	9	0	1
Your Reference	-----	BH2/ 1.6-2.0	BH2/ 2.1-2.5	BH2/ 2.6-3.0	BH2/ 3.1-3.5	BH2/ 3.6-4.0
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed (moisture)		26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010
Moisture	%	4	5	9	3	4

Moisture						
Our Reference:	UNITS	SE80889-4	SE80889-4	SE80889-4	SE80889-4	SE80889-4
		2	3	4	5	6
Your Reference	-----	BH2/ 5.1-5.5	BH2/ 4.6-5.0	BH5/ 0.6-1.0	BH5/ 1.1-1.5	BH5/ 1.6-2.0
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed (moisture)		26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010
Moisture	%	12	21	3	5	3

Moisture						
Our Reference:	UNITS	SE80889-4	SE80889-4	SE80889-4	SE80889-5	SE80889-5
		7	8	9	0	1
Your Reference	-----	BH5/ 2.1-2.5	BH5/ 2.6-3.0	BH5/ 4-4.5	BH5/ 5.5-6.0	TB1/ 200810
Sample Matrix	-----	Soil	Soil	Soil	Soil	Soil
Date Analysed (moisture)		26/08/2010	26/08/2010	26/08/2010	26/08/2010	26/08/2010
Moisture	%	6	6	20	20	<1



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Moisture		
Our Reference:	UNITS	SE80889-5
		3
Your Reference	-----	TB/ 230810
Sample Matrix	-----	Soil
Date Analysed (moisture)		26/08/2010
Moisture	%	<1



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Method ID	Methodology Summary
SEO-018	BTEX / C6-C9 Hydrocarbons - Soil samples are extracted with methanol, purged and concentrated by a purge and trap apparatus, and then analysed using GC/MS technique. Water samples undergo the same analysis without the extraction step. Based on USEPA 5030B and 8260B.
SEO-020	Total Recoverable Hydrocarbons - determined by solvent extraction with dichloromethane / acetone for soils and dichloromethane for waters, followed by instrumentation analysis using GC/FID. Where applicable Solid Phase Extraction Manifold technique is used for aliphatic / aromatic fractionation.
SEO-030	Polynuclear Aromatic Hydrocarbons - determined by solvent extraction with dichloromethane / acetone for soils and dichloromethane for waters, followed by instrumentation analysis using GC/MS SIM mode.
SEO-005	OC/OP/PCB - Determination of a suite of Organochlorine Pesticides, Chlorinated Organo-phosphorus Pesticides and Polychlorinated Biphenyls (PCB's) by liquid-liquid extraction using dichloromethane for waters, or mechanical extraction using acetone / hexane for soils, followed by instrumentation analysis using GC/ECD. Based on USEPA 8081/8082.
AN420	Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates, and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD/FID technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN289	Total Phenols - Determined by colourimetric method using Discrete Analyser, following distillation of the sample. Based on APHA 21st Edition 5530B and 5530D.
AN101	pH - Measured using pH meter and electrode based on APHA 21st Edition, 4500-H+. For water analyses the results reported are indicative only as the sample holding time requirement specified in APHA was not met (APHA requires that the pH of the samples are to be measured within 15 minutes after sampling).
SEI-037	Ammonia - Determined by salicylate colourimetric method using Discrete Analyser.
AN106	Conductivity and TDS by Calculation (cTDS) - Conductivity is measured using a conductivity cell and dedicated meter, in accordance with APHA 21st Edition, 2510. TDS is calculated by $TDS(mg/L) = 0.6 \times \text{Conductivity}(\mu S/cm)$.
SEM-010	Determination of elements by ICP-OES following appropriate sample preparation / digestion process. Based on USEPA 6010C / APHA 21st Edition, 3120B.
SEM-005	Mercury - determined by Cold-Vapour AAS following appropriate sample preparation or digestion process. Based on APHA 21st Edition, 3112B.
AN602	Analysed using in house method AN602 - Qualitative identification of Asbestos Fibres, Synthetic Mineral Fibres and Organic Fibres in bulk samples (including building materials and soils) using Polarised Light Microscopy and Dispersion Staining Techniques. Our NATA Accreditation does not currently cover the identification of Synthetic Mineral Fibres and Organic Fibres, however, according to new NATA requirements, the reporting of these fibres is compulsory if detected.



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Method ID	Methodology Summary
AN002	Preparation of soils, sediments and sludges undergo analysis by either air drying, compositing, subsampling and 1:5 soil water extraction where required. Moisture content is determined by drying the sample at $105 \pm 5^{\circ}\text{C}$.



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD
MBTEX in Soil						
Date Extracted (MBTEX)				27/08/10	SE80889-2 1	27/08/2010 27/08/2010
Date Analysed (MBTEX)				27/08/10	SE80889-2 1	27/08/2010 27/08/2010
Benzene	mg/kg	0.1	SEO-018	<0.1	SE80889-2 1	<0.1 <0.1
Toluene	mg/kg	0.1	SEO-018	<0.1	SE80889-2 1	<0.1 <0.1
Ethylbenzene	mg/kg	0.1	SEO-018	<0.1	SE80889-2 1	<0.1 <0.1
Total Xylenes	mg/kg	0.3	SEO-018	<0.3	SE80889-2 1	<0.3 <0.3
BTEX Surrogate (%)	%	0	SEO-018	72	SE80889-2 1	70 68 RPD: 3

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
BTEX in Soil				
Date Extracted (BTEX)				27/08/10
Date Analysed (BTEX)				27/08/10
Benzene	mg/kg	0.1	SEO-018	<0.1
Toluene	mg/kg	0.1	SEO-018	<0.1
Ethylbenzene	mg/kg	0.1	SEO-018	<0.1
Total Xylenes	mg/kg	0.3	SEO-018	<0.3
BTEX Surrogate (%)	%	0	SEO-018	72

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
TRH in soil with C6-C9 by P/T								
Date Extracted (TRH C6-C9 PT)				27/08/10	SE80889-2 1	27/08/2010 27/08/2010	[NR]	[NR]
Date Analysed (TRH C6-C9 PT)				27/08/10	SE80889-2 1	27/08/2010 27/08/2010	[NR]	[NR]
TRH C6 - C9 P&T	mg/kg	20	SEO-018	<20	SE80889-2 1	<20 <20	[NR]	[NR]
Date Extracted (TRH C10-C36)				27/08/2010	SE80889-2 1	27/08/2010 27/08/2010	SE80889-2	27/08/10
Date Analysed (TRH C10-C36)				28/08/2010	SE80889-2 1	27/08/2010 27/08/2010	SE80889-2	28/08/10
TRH C10 - C14	mg/kg	20	SEO-020	<20	SE80889-2 1	<20 [N/T]	SE80889-2	111%



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
TRH in soil with C6-C9 by P/T								
TRH C15 - C28	mg/kg	50	SEO-020	<50	SE80889-2 1	<50 [N/T]	SE80889-2	104%
TRH C29 - C36	mg/kg	50	SEO-020	<50	SE80889-2 1	<50 [N/T]	SE80889-2	96%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
PAHs in Soil								
Date Extracted				27/08/2010	SE80889-2 4	27/08/2010 27/08/2010	SE80889-3	27/08/2010
Date Analysed				27/08/2010	SE80889-2 4	27/08/2010 27/08/2010	SE80889-3	27/08/2010
Naphthalene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	SE80889-3	109%
2-Methylnaphthalene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	[NR]	[NR]
1-Methylnaphthalene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	[NR]	[NR]
Acenaphthylene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	SE80889-3	96%
Acenaphthene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	SE80889-3	112%
Fluorene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	[NR]	[NR]
Phenanthrene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	SE80889-3	109%
Anthracene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	SE80889-3	105%
Fluoranthene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	SE80889-3	102%
Pyrene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	SE80889-3	108%
Benzo[a]anthracene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	[NR]	[NR]
Chrysene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	[NR]	[NR]
Benzo[b,k]fluoranthene	mg/kg	0.2	SEO-030	<0.20	SE80889-2 4	<0.20 <0.20	[NR]	[NR]
Benzo[a]pyrene	mg/kg	0.05	SEO-030	<0.05	SE80889-2 4	<0.05 <0.05	SE80889-3	93%
Indeno[123-cd]pyrene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	[NR]	[NR]
Dibenzo[ah]anthracene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	[NR]	[NR]
Benzo[ghi]perylene	mg/kg	0.1	SEO-030	<0.10	SE80889-2 4	<0.10 <0.10	[NR]	[NR]



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
PAHs in Soil								
Total PAHs (sum)	mg/kg	1.75	SEO-030	<1.7	SE80889-2 4	<1.7 <1.7	[NR]	[NR]
Nitrobenzene-d5	%	0	SEO-030	96	SE80889-2 4	100 94 RPD: 6	SE80889-3	95%
2-Fluorobiphenyl	%	0	SEO-030	94	SE80889-2 4	95 91 RPD: 4	SE80889-3	92%
<i>p</i> -Terphenyl- <i>d</i> 14	%	0	SEO-030	92	SE80889-2 4	92 86 RPD: 7	SE80889-3	89%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
OC Pesticides in Soil								
Date Extracted				27/08/2010	SE80889-6	27/08/2010 27/08/2010	SE80889-7	27/08/2010
Date Analysed				27/08/2010	SE80889-6	27/08/2010 27/08/2010	SE80889-7	27/08/2010
HCB	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>alpha</i> -BHC	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
gamma-BHC (Lindane)	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Heptachlor	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	SE80889-7	138%
Aldrin	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	SE80889-7	128%
<i>beta</i> -BHC	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>delta</i> -BHC	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	SE80889-7	117%
Heptachlor Epoxide	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>o,p</i> -DDE	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>alpha</i> -Endosulfan	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>trans</i> -Chlordane (<i>gamma</i>)	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>cis</i> -Chlordane (<i>alpha</i>)	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>trans</i> -Nonachlor	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>p,p</i> -DDE	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Dieldrin	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	SE80889-7	130%
Endrin	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	SE80889-7	137%
<i>o,p</i> -DDD	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>o,p</i> -DDT	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>beta</i> -Endosulfan	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>p,p</i> -DDD	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
<i>p,p</i> -DDT	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	SE80889-7	130%
Endosulfan Sulphate	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Endrin Aldehyde	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Methoxychlor	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
OC Pesticides in Soil								
Endrin Ketone	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
2,4,5,6-Tetrachloro-m-xylene (Surrogate)	%	0	SEO-005	88	SE80889-6	100 100 RPD: 0	SE80889-7	99%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
OP Pesticides in Soil by GCMS								
Date Extracted				27/08/10	[NT]	[NT]	SE80889-5	28/08/10
Date Analysed				27/08/10	[NT]	[NT]	SE80889-5	28/08/10
Dichlorvos	mg/kg	1	AN420	<1	[NT]	[NT]	SE80889-5	112%
Dimethoate	mg/kg	1	AN420	<1	[NT]	[NT]	[NR]	[NR]
Diazinon	mg/kg	0.5	AN420	<0.5	[NT]	[NT]	SE80889-5	114%
Fenitrothion	mg/kg	0.2	AN420	<0.2	[NT]	[NT]	[NR]	[NR]
Malathion	mg/kg	0.2	AN420	<0.20	[NT]	[NT]	[NR]	[NR]
Chlorpyrifos-ethyl	mg/kg	0.2	AN420	<0.2	[NT]	[NT]	SE80889-5	123%
Parathion-ethyl	mg/kg	0.2	AN420	<0.2	[NT]	[NT]	[NR]	[NR]
Bromofos-ethyl	mg/kg	0.2	AN420	<0.2	[NT]	[NT]	[NR]	[NR]
Methidathion	mg/kg	0.5	AN420	<0.5	[NT]	[NT]	[NR]	[NR]
Ethion	mg/kg	0.2	AN420	<0.2	[NT]	[NT]	SE80889-5	99%
Azinphos-methyl	mg/kg	0.2	AN420	<0.20	[NT]	[NT]	[NR]	[NR]
2-fluorobiphenyl (Surr)	%	0	AN420	98	[NT]	[NT]	SE80889-5	112%
d14-p-Terphenyl (Surr)	%	0	AN420	78	[NT]	[NT]	SE80889-5	104%



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
PCBs in Soil								
Date Extracted				27/08/2010	SE80889-6	27/08/2010 27/08/2010	SE80889-9	27/08/2010
Date Analysed				27/08/2010	SE80889-6	27/08/2010 27/08/2010	SE80889-9	27/08/2010
Arochlor 1016	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Arochlor 1221	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Arochlor 1232	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Arochlor 1242	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Arochlor 1248	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Arochlor 1254	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Arochlor 1260	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	SE80889-9	120%
Arochlor 1262	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Arochlor 1268	mg/kg	0.1	SEO-005	<0.1	SE80889-6	<0.1 <0.1	[NR]	[NR]
Total Positive PCB	mg/kg	0.9	SEO-005	<0.90	SE80889-6	<0.90 <0.90	[NR]	[NR]
PCB_Surrogate 1	%	0	SEO-005	88	SE80889-6	100 100 RPD: 0	SE80889-9	95%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Total Phenolics in Soil								
Date Extracted (Phenols)				27/08/10	SE80889-1	27/08/2010 27/08/2010	SE80889-5	27/08/10
Date Analysed (Phenols)				27/08/10	SE80889-1	27/08/2010 27/08/2010	SE80889-5	27/08/10
Total Phenolics (as Phenol)	mg/kg	0.1	AN289	<0.1	SE80889-1	<0.1 <0.1	SE80889-5	84%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Inorganics				
Date Extracted- (pH 1:5 soil: Water)				[NT]
Date Analysed (pH 1:5 Soil: Water)				[NT]
pH 1:5 soil:water	pH Units	0	AN101	[NT]
Electrical Conductivity 1:5 soil:water	µS/cm	1	AN106	[NT]



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Metals in Soil by ICP-OES								
Date Extracted (Metals)				27/08/2010	SE80889-1	27/08/2010 27/08/2010	SE80889-2 3	27/08/2010
Date Analysed (Metals)				27/08/2010	SE80889-1	27/08/2010 27/08/2010	SE80889-2 3	27/08/2010
Arsenic	mg/kg	3	SEM-010	<3	SE80889-1	<3 <3	SE80889-2 3	114%
Cadmium	mg/kg	0.3	SEM-010	<0.3	SE80889-1	<0.3 <0.3	SE80889-2 3	121%
Chromium	mg/kg	0.3	SEM-010	<0.3	SE80889-1	2.7 2.8 RPD: 4	SE80889-2 3	104%
Copper	mg/kg	0.5	SEM-010	<0.5	SE80889-1	2.7 2.8 RPD: 4	SE80889-2 3	112%
Lead	mg/kg	1	SEM-010	<1	SE80889-1	5 6 RPD: 18	SE80889-2 3	125%
Nickel	mg/kg	0.5	SEM-010	<0.5	SE80889-1	1.2 1.2 RPD: 0	SE80889-2 3	124%
Zinc	mg/kg	0.5	SEM-010	<0.5	SE80889-1	16 17 RPD: 6	SE80889-2 3	123%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Mercury Cold Vapor/Hg Analyser								
Date Extracted (Mercury)				27/08/2010	SE80889-1	27/08/2010 27/08/2010	LCS	27/08/2010
Date Analysed (Mercury)				27/08/2010	SE80889-1	27/08/2010 27/08/2010	LCS	27/08/2010
Mercury	mg/kg	0.05	SEM-005	<0.05	SE80889-1	<0.05 <0.05	LCS	100%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Asbestos ID in soil				
Date Analysed				[NT]

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Moisture				
Date Analysed (moisture)				[NT]
Moisture	%	1	AN002	<1



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
MBTEX in Soil			Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (MBTEX)		SE80889-3 1	27/08/2010 27/08/2010	SE80889-3 2	27/08/10
Date Analysed (MBTEX)		SE80889-3 1	27/08/2010 27/08/2010	SE80889-3 2	27/08/10
Benzene	mg/kg	SE80889-3 1	<0.1 <0.1	SE80889-3 2	60%
Toluene	mg/kg	SE80889-3 1	<0.1 <0.1	SE80889-3 2	62%
Ethylbenzene	mg/kg	SE80889-3 1	<0.1 <0.1	SE80889-3 2	64%
Total Xylenes	mg/kg	SE80889-3 1	<0.3 <0.3	SE80889-3 2	69%
BTEX Surrogate (%)	%	SE80889-3 1	60 62 RPD: 3	SE80889-3 2	76%

QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
TRH in soil with C6-C9 by P/T			Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		SE80889-3 1	27/08/2010 27/08/2010	SE80889-3 2	27/08/10
Date Analysed (TRH C6-C9 PT)		SE80889-3 1	27/08/2010 27/08/2010	SE80889-3 2	27/08/10
TRH C6 - C9 P&T	mg/kg	SE80889-3 1	<20 <20	SE80889-3 2	71%
Date Extracted (TRH C10-C36)		SE80889-3 1	27/08/2010 27/08/2010	[NR]	[NR]
Date Analysed (TRH C10-C36)		SE80889-3 1	27/08/2010 27/08/2010	[NR]	[NR]



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
PAHs in Soil			Base + Duplicate + %RPD		
Date Extracted		SE80889-1	27/08/2010 27/08/2010	SE80889-2 6	27/08/10
Date Analysed		SE80889-1	27/08/2010 27/08/2010	SE80889-2 6	27/08/10
Naphthalene	mg/kg	SE80889-1	<0.10 <0.10	SE80889-2 6	126%
2-Methylnaphthalene	mg/kg	SE80889-1	<0.10 <0.10	[NR]	[NR]
1-Methylnaphthalene	mg/kg	SE80889-1	<0.10 <0.10	[NR]	[NR]
Acenaphthylene	mg/kg	SE80889-1	<0.10 <0.10	SE80889-2 6	97%
Acenaphthene	mg/kg	SE80889-1	<0.10 <0.10	SE80889-2 6	135%
Fluorene	mg/kg	SE80889-1	<0.10 <0.10	[NR]	[NR]
Phenanthrene	mg/kg	SE80889-1	<0.10 <0.10	SE80889-2 6	66%
Anthracene	mg/kg	SE80889-1	<0.10 <0.10	SE80889-2 6	98%
Fluoranthene	mg/kg	SE80889-1	<0.10 <0.10	SE80889-2 6	#
Pyrene	mg/kg	SE80889-1	<0.10 <0.10	SE80889-2 6	#
Benzo[a]anthracene	mg/kg	SE80889-1	<0.10 <0.10	[NR]	[NR]
Chrysene	mg/kg	SE80889-1	<0.10 <0.10	[NR]	[NR]
Benzo[b,k]fluoranthene	mg/kg	SE80889-1	<0.20 <0.20	[NR]	[NR]
Benzo[a]pyrene	mg/kg	SE80889-1	<0.05 <0.05	SE80889-2 6	#
Indeno[123-cd]pyrene	mg/kg	SE80889-1	<0.10 <0.10	[NR]	[NR]
Dibenzo[ah]anthracene	mg/kg	SE80889-1	<0.10 <0.10	[NR]	[NR]
Benzo[ghi]perylene	mg/kg	SE80889-1	<0.10 <0.10	[NR]	[NR]
Total PAHs (sum)	mg/kg	SE80889-1	<1.7 <1.7	[NR]	[NR]
Nitrobenzene-d5	%	SE80889-1	94 96 RPD: 2	SE80889-2 6	106%
2-Fluorobiphenyl	%	SE80889-1	94 94 RPD: 0	SE80889-2 6	103%
<i>p</i> -Terphenyl-d14	%	SE80889-1	76 74 RPD: 3	SE80889-2 6	102%



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QUALITY CONTROL OC Pesticides in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted		SE80889-2 7	27/08/2010 27/08/2010
Date Analysed		SE80889-2 7	27/08/2010 27/08/2010
HCB	mg/kg	SE80889-2 7	<0.1 <0.1
<i>alpha</i> -BHC	mg/kg	SE80889-2 7	<0.1 <0.1
gamma-BHC (Lindane)	mg/kg	SE80889-2 7	<0.1 <0.1
Heptachlor	mg/kg	SE80889-2 7	<0.1 <0.1
Aldrin	mg/kg	SE80889-2 7	<0.1 <0.1
<i>beta</i> -BHC	mg/kg	SE80889-2 7	<0.1 <0.1
<i>delta</i> -BHC	mg/kg	SE80889-2 7	<0.1 <0.1
Heptachlor Epoxide	mg/kg	SE80889-2 7	<0.1 <0.1
<i>o,p</i> -DDE	mg/kg	SE80889-2 7	<0.1 <0.1
<i>alpha</i> -Endosulfan	mg/kg	SE80889-2 7	<0.1 <0.1
<i>trans</i> -Chlordane (<i>gamma</i>)	mg/kg	SE80889-2 7	<0.1 <0.1
<i>cis</i> -Chlordane (<i>alpha</i>)	mg/kg	SE80889-2 7	<0.1 <0.1
<i>trans</i> -Nonachlor	mg/kg	SE80889-2 7	<0.1 <0.1
<i>p,p</i> -DDE	mg/kg	SE80889-2 7	<0.1 <0.1
Dieldrin	mg/kg	SE80889-2 7	<0.1 <0.1
Endrin	mg/kg	SE80889-2 7	<0.1 <0.1
<i>o,p</i> -DDD	mg/kg	SE80889-2 7	<0.1 <0.1
<i>o,p</i> -DDT	mg/kg	SE80889-2 7	<0.1 <0.1
<i>beta</i> -Endosulfan	mg/kg	SE80889-2 7	<0.1 <0.1
<i>p,p</i> -DDD	mg/kg	SE80889-2 7	<0.1 <0.1



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QUALITY CONTROL OC Pesticides in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
<i>p,p</i> -DDT	mg/kg	SE80889-2 7	<0.1 <0.1
Endosulfan Sulphate	mg/kg	SE80889-2 7	<0.1 <0.1
Endrin Aldehyde	mg/kg	SE80889-2 7	<0.1 <0.1
Methoxychlor	mg/kg	SE80889-2 7	<0.1 <0.1
Endrin Ketone	mg/kg	SE80889-2 7	<0.1 <0.1
2,4,5,6-Tetrachloro-m-xylene (Surrogate)	%	SE80889-2 7	97 102 RPD: 5

QUALITY CONTROL OP Pesticides in Soil by GCMS	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted		SE80889-1	27/08/2010 27/08/2010
Date Analysed		SE80889-1	27/08/2010 27/08/2010
Dichlorvos	mg/kg	SE80889-1	<1 <1
Dimethoate	mg/kg	SE80889-1	<1 <1
Diazinon	mg/kg	SE80889-1	<0.5 <0.5
Fenitrothion	mg/kg	SE80889-1	<0.2 <0.2
Malathion	mg/kg	SE80889-1	<0.20 <0.20
Chlorpyrifos-ethyl	mg/kg	SE80889-1	<0.2 <0.2
Parathion-ethyl	mg/kg	SE80889-1	<0.2 <0.2
Bromofos-ethyl	mg/kg	SE80889-1	<0.2 <0.2
Methidathion	mg/kg	SE80889-1	<0.5 <0.5
Ethion	mg/kg	SE80889-1	<0.2 <0.2
Azinphos-methyl	mg/kg	SE80889-1	<0.20 <0.20
2-fluorobiphenyl (Surr)	%	SE80889-1	94 94 RPD: 0
d14-p-Terphenyl (Surr)	%	SE80889-1	76 74 RPD: 3



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QUALITY CONTROL PCBs in Soil	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted		SE80889-2 7	27/08/2010 27/08/2010
Date Analysed		SE80889-2 7	27/08/2010 27/08/2010
Arochlor 1016	mg/kg	SE80889-2 7	<0.1 <0.1
Arochlor 1221	mg/kg	SE80889-2 7	<0.1 <0.1
Arochlor 1232	mg/kg	SE80889-2 7	<0.1 <0.1
Arochlor 1242	mg/kg	SE80889-2 7	<0.1 <0.1
Arochlor 1248	mg/kg	SE80889-2 7	<0.1 <0.1
Arochlor 1254	mg/kg	SE80889-2 7	<0.1 <0.1
Arochlor 1260	mg/kg	SE80889-2 7	<0.1 <0.1
Arochlor 1262	mg/kg	SE80889-2 7	<0.1 <0.1
Arochlor 1268	mg/kg	SE80889-2 7	<0.1 <0.1
Total Positive PCB	mg/kg	SE80889-2 7	<0.90 <0.90
PCB_Surrogate 1	%	SE80889-2 7	97 102 RPD: 5



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Total Phenolics in Soil			
Date Extracted (Phenols)		SE80889-2 1	27/08/2010 27/08/2010
Date Analysed (Phenols)		SE80889-2 1	27/08/2010 27/08/2010
Total Phenolics (as Phenol)	mg/kg	SE80889-2 1	0.7 0.4 RPD: 55

QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Metals in Soil by ICP-OES					
Date Extracted (Metals)		SE80889-1 1	27/08/2010 27/08/2010	SE80889-2	27/08/2010
Date Analysed (Metals)		SE80889-1 1	27/08/2010 27/08/2010	SE80889-2	27/08/2010
Arsenic	mg/kg	SE80889-1 1	<3 <3	SE80889-2	113%
Cadmium	mg/kg	SE80889-1 1	<0.3 <0.3	SE80889-2	113%
Chromium	mg/kg	SE80889-1 1	1.8 1.6 RPD: 12	SE80889-2	102%
Copper	mg/kg	SE80889-1 1	34 36 RPD: 6	SE80889-2	94%
Lead	mg/kg	SE80889-1 1	73 62 RPD: 16	SE80889-2	115%
Nickel	mg/kg	SE80889-1 1	<0.5 <0.5	SE80889-2	109%
Zinc	mg/kg	SE80889-1 1	58 60 RPD: 3	SE80889-2	106%



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
Mercury Cold Vapor/Hg Analyser			Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (Mercury)		SE80889-1 1	27/08/2010 27/08/2010	SE80889-2 3	27/08/2010
Date Analysed (Mercury)		SE80889-1 1	27/08/2010 27/08/2010	SE80889-2 3	27/08/2010
Mercury	mg/kg	SE80889-1 1	0.10 0.21 RPD: 71	SE80889-2 3	95%

QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
MBTEX in Soil			Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (MBTEX)		SE80889-1	27/08/2010 27/08/2010	[NR]	[NR]
Date Analysed (MBTEX)		SE80889-1	27/08/2010 27/08/2010	[NR]	[NR]
Benzene	mg/kg	SE80889-1	<0.1 <0.1	[NR]	[NR]
Toluene	mg/kg	SE80889-1	<0.1 <0.1	[NR]	[NR]
Ethylbenzene	mg/kg	SE80889-1	<0.1 <0.1	[NR]	[NR]
Total Xylenes	mg/kg	SE80889-1	<0.3 <0.3	[NR]	[NR]
BTEX Surrogate (%)	%	SE80889-1	73 81 RPD: 10	[NR]	[NR]

QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
TRH in soil with C6-C9 by P/T			Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		SE80889-1	27/08/2010 27/08/2010	SE80889-1 2	27/08/10
Date Analysed (TRH C6-C9 PT)		SE80889-1	27/08/2010 27/08/2010	SE80889-1 2	27/08/10
TRH C6 - C9 P&T	mg/kg	SE80889-1	<20 <20	SE80889-1 2	77%
Date Extracted (TRH C10-C36)		SE80889-1	27/08/2010 27/08/2010	[NR]	[NR]
Date Analysed (TRH C10-C36)		SE80889-1	27/08/2010 27/08/2010	[NR]	[NR]
TRH C10 - C14	mg/kg	SE80889-1	<20 <20	[NR]	[NR]
TRH C15 - C28	mg/kg	SE80889-1	<50 <50	[NR]	[NR]
TRH C29 - C36	mg/kg	SE80889-1	<50 <50	[NR]	[NR]



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
PAHs in Soil			Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted		SE80889-1 3	27/08/2010 27/08/2010	LCS	27/08/10
Date Analysed		SE80889-1 3	27/08/2010 27/08/2010	LCS	27/08/10
Naphthalene	mg/kg	SE80889-1 3	<0.10 <0.10	LCS	116%
2-Methylnaphthalene	mg/kg	SE80889-1 3	<0.10 <0.10	[NR]	[NR]
1-Methylnaphthalene	mg/kg	SE80889-1 3	<0.10 <0.10	[NR]	[NR]
Acenaphthylene	mg/kg	SE80889-1 3	0.43 0.38 RPD: 12	LCS	106%
Acenaphthene	mg/kg	SE80889-1 3	<0.10 <0.10	LCS	121%
Fluorene	mg/kg	SE80889-1 3	0.19 0.16 RPD: 17	[NR]	[NR]
Phenanthrene	mg/kg	SE80889-1 3	4.6 4.1 RPD: 11	LCS	118%
Anthracene	mg/kg	SE80889-1 3	0.93 0.84 RPD: 10	LCS	112%
Fluoranthene	mg/kg	SE80889-1 3	8.2 7.2 RPD: 13	LCS	110%
Pyrene	mg/kg	SE80889-1 3	8.4 7.3 RPD: 14	LCS	115%
Benzo[a]anthracene	mg/kg	SE80889-1 3	5.0 4.5 RPD: 11	[NR]	[NR]
Chrysene	mg/kg	SE80889-1 3	3.5 3.1 RPD: 12	[NR]	[NR]
Benzo[b,k]fluoranthene	mg/kg	SE80889-1 3	5.7 5.2 RPD: 9	[NR]	[NR]
Benzo[a]pyrene	mg/kg	SE80889-1 3	3.6 3.3 RPD: 9	LCS	98%
Indeno[123-cd]pyrene	mg/kg	SE80889-1 3	1.5 1.4 RPD: 7	[NR]	[NR]
Dibenzo[ah]anthracene	mg/kg	SE80889-1 3	0.30 0.29 RPD: 3	[NR]	[NR]
Benzo[ghi]perylene	mg/kg	SE80889-1 3	1.2 1.1 RPD: 9	[NR]	[NR]
Total PAHs (sum)	mg/kg	SE80889-1 3	<44.04 <39.33	[NR]	[NR]
Nitrobenzene-d5	%	SE80889-1 3	106 88 RPD: 19	LCS	92%
2-Fluorobiphenyl	%	SE80889-1 3	106 90 RPD: 16	LCS	89%



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
PAHs in Soil			Base + Duplicate + %RPD		Duplicate + %RPD
<i>p</i> -Terphenyl- <i>d</i> 14	%	SE80889-1 3	88 62 RPD: 35	LCS	87%

QUALITY CONTROL OP Pesticides in Soil by GCMS	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted		SE80889-1 3	27/08/2010 27/08/2010
Date Analysed		SE80889-1 3	27/08/2010 27/08/2010
Dichlorvos	mg/kg	SE80889-1 3	<1 <1
Dimethoate	mg/kg	SE80889-1 3	<1 <1
Diazinon	mg/kg	SE80889-1 3	<0.5 <0.5
Fenitrothion	mg/kg	SE80889-1 3	<0.2 <0.2
Malathion	mg/kg	SE80889-1 3	<0.20 <0.20
Chlorpyrifos-ethyl	mg/kg	SE80889-1 3	<0.2 <0.2
Parathion-ethyl	mg/kg	SE80889-1 3	<0.2 <0.2
Bromofos-ethyl	mg/kg	SE80889-1 3	<0.2 <0.2
Methidathion	mg/kg	SE80889-1 3	<0.5 <0.5
Ethion	mg/kg	SE80889-1 3	<0.2 <0.2
Azinphos-methyl	mg/kg	SE80889-1 3	<0.20 <0.20
2-fluorobiphenyl (Surr)	%	SE80889-1 3	106 94 RPD: 12
d14-p-Terphenyl (Surr)	%	SE80889-1 3	88 74 RPD: 17



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QUALITY CONTROL Metals in Soil by ICP-OES	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted (Metals)		SE80889-2 2	27/08/2010 27/08/2010
Date Analysed (Metals)		SE80889-2 2	27/08/2010 27/08/2010
Arsenic	mg/kg	SE80889-2 2	4 5 RPD: 22
Cadmium	mg/kg	SE80889-2 2	<0.3 <0.3
Chromium	mg/kg	SE80889-2 2	11 12 RPD: 9
Copper	mg/kg	SE80889-2 2	59 74 RPD: 23
Lead	mg/kg	SE80889-2 2	120 140 RPD: 15
Nickel	mg/kg	SE80889-2 2	3.1 3.5 RPD: 12
Zinc	mg/kg	SE80889-2 2	120 140 RPD: 15

QUALITY CONTROL Mercury Cold Vapor/Hg Analyser	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted (Mercury)		SE80889-2 2	27/08/2010 27/08/2010
Date Analysed (Mercury)		SE80889-2 2	27/08/2010 27/08/2010
Mercury	mg/kg	SE80889-2 2	0.35 0.45 RPD: 25

QUALITY CONTROL TRH in soil with C6-C9 by P/T	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		SE80889-1 1	27/08/2010 27/08/2010	[NR]	[NR]
Date Analysed (TRH C6-C9 PT)		SE80889-1 1	27/08/2010 27/08/2010	[NR]	[NR]
TRH C6 - C9 P&T	mg/kg	SE80889-1 1	<20 <20	[NR]	[NR]
Date Extracted (TRH C10-C36)		SE80889-1 1	27/08/2010 27/08/2010	SE80889-2 5	27/08/2010
Date Analysed (TRH C10-C36)		SE80889-1 1	27/08/2010 27/08/2010	SE80889-2 5	28/08/2010



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
TRH in soil with C6-C9 by P/T			Base + Duplicate + %RPD		Duplicate + %RPD
TRH C10 - C14	mg/kg	SE80889-1 1	<20 [N/T]	SE80889-2 5	112%
TRH C15 - C28	mg/kg	SE80889-1 1	<50 [N/T]	SE80889-2 5	103%
TRH C29 - C36	mg/kg	SE80889-1 1	<50 [N/T]	SE80889-2 5	98%

QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate
Inorganics			Base + Duplicate + %RPD
Date Extracted- (pH 1:5 soil: Water)		SE80889-3 8	27/08/2010 27/08/2010
Date Analysed (pH 1:5 Soil: Water)		SE80889-3 8	27/08/2010 27/08/2010
pH 1:5 soil:water	pH Units	SE80889-3 8	7.9 8.0 RPD: 1
Electrical Conductivity 1:5 soil:water	µS/cm	SE80889-3 8	27 27 RPD: 0

QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate
Inorganics			Base + Duplicate + %RPD
Date Extracted- (pH 1:5 soil: Water)		SE80889-4 8	27/08/2010 27/08/2010
Date Analysed (pH 1:5 Soil: Water)		SE80889-4 8	27/08/2010 27/08/2010
pH 1:5 soil:water	pH Units	SE80889-4 8	6.1 6.1 RPD: 0
Electrical Conductivity 1:5 soil:water	µS/cm	SE80889-4 8	9.3 9.1 RPD: 2



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QUALITY CONTROL TRH in soil with C6-C9 by P/T	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		SE80889-1 3	27/08/2010 27/08/2010
Date Analysed (TRH C6-C9 PT)		SE80889-1 3	27/08/2010 27/08/2010
TRH C6 - C9 P&T	mg/kg	SE80889-1 3	<20 [N/T]
Date Extracted (TRH C10-C36)		SE80889-1 3	27/08/2010 27/08/2010
Date Analysed (TRH C10-C36)		SE80889-1 3	27/08/2010 27/08/2010
TRH C10 - C14	mg/kg	SE80889-1 3	<20 <20
TRH C15 - C28	mg/kg	SE80889-1 3	120 120 RPD: 0
TRH C29 - C36	mg/kg	SE80889-1 3	62 60 RPD: 3

QUALITY CONTROL TRH in soil with C6-C9 by P/T	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		SE80889-2 4	27/08/2010 27/08/2010
Date Analysed (TRH C6-C9 PT)		SE80889-2 4	27/08/2010 27/08/2010
TRH C6 - C9 P&T	mg/kg	SE80889-2 4	<20 [N/T]
Date Extracted (TRH C10-C36)		SE80889-2 4	27/08/2010 27/08/2010
Date Analysed (TRH C10-C36)		SE80889-2 4	27/08/2010 27/08/2010
TRH C10 - C14	mg/kg	SE80889-2 4	<20 <20
TRH C15 - C28	mg/kg	SE80889-2 4	<50 <50
TRH C29 - C36	mg/kg	SE80889-2 4	<50 <50



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QUALITY CONTROL TRH in soil with C6-C9 by P/T	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		SE80889-3 4	27/08/2010 27/08/2010
Date Analysed (TRH C6-C9 PT)		SE80889-3 4	27/08/2010 27/08/2010
TRH C6 - C9 P&T	mg/kg	SE80889-3 4	<20 [N/T]
Date Extracted (TRH C10-C36)		SE80889-3 4	27/08/2010 27/08/2010
Date Analysed (TRH C10-C36)		SE80889-3 4	27/08/2010 27/08/2010
TRH C10 - C14	mg/kg	SE80889-3 4	<20 <20
TRH C15 - C28	mg/kg	SE80889-3 4	<50 <50
TRH C29 - C36	mg/kg	SE80889-3 4	<50 <50



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Result Codes

[INS] : Insufficient Sample for this test
[NR] : Not Requested
[NT] : Not tested
[LOR] : Limit of reporting

[RPD] : Relative Percentage Difference
* : Not part of NATA Accreditation
[N/A] : Not Applicable

Report Comments

PAH - # 26 Spikes not reported due to sample matrix interference. LCS reported.

Sampled by the client

Even after disintegration it can be very difficult, or impossible, to detect the presence of asbestos in some asbestos-containing bulk materials using polarised light microscopy.

This is due to the low grade or small length or diameter of asbestos fibres present in the material, or to the fact that very fine fibres have been distributed intimately throughout the materials.

No respirable fibres detected using trace analysis technique.

Sample # 15: 2 mm length fibre bundle hand picked and found loose in sample

Sample # 18: 1-2mm length fibre bundles found in 5x3 mm cement sheet fragment.

Asbestos analysed by Approved Identifier Ravee Sivasubramaniam.

Samples analysed as received. Solid samples expressed on a dry weight basis.

Date Organics extraction commenced:

NATA Corporate Accreditation No. 2562, Site No 4354

Note: Test results are not corrected for recovery (excluding Air-toxics and Dioxins/Furans*)

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Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.

Duplicate: A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.

Surrogate Spike: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are added to samples before extraction to monitor extraction efficiency and percent recovery in each sample.

Internal Standard: Added to all samples requiring analysis for organics (where relevant) or metals by ICP after the extraction/digestion process; the compounds/elements serve to give a standard of retention time and/or response, which is invariant from run-to-run with the instruments.

Laboratory Control Sample: A known matrix spiked with compound(s) representative of the target analytes. It is used to document laboratory performance. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

Matrix Spike: An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.



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Quality Acceptance Criteria

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: <http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf>



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SGS Australia Pty Ltd
ABN 44 000 964 278

Environmental Services Unit 16/33 Maddox Street Alexandria NSW 2015 Australia
t +61 (0)2 8594 0400 f + 61 (0)2 8594 0499 www.au.sgs.com



ANALYTICAL REPORT



CLIENT DETAILS

Contact Lindsay Rockett
Client DOUGLAS PARTNERS
Address PO Box 6432
Bourke Rd Business Centre
ALEXANDRIA NSW 2015

Telephone 02 8594 0400
Facsimile 02 8594 0499
Email edward.ibrahim@sgs.com

Project 71976.01-Randwick, Spec & Stable (SE81160)
Order Number (Not specified)
Samples 2

LABORATORY DETAILS

Manager Said Hira
Laboratory SGS Newburn Environmental
Address 10 Reid Rd
Newburn WA 6104

Telephone (08) 9373 3500
Facsimile (08) 9373 3556
Email au.environmental.perth@sgs.com

SGS Reference PE052327 R0
Report Number 0000006306
Date Reported 17 Sep 2010

COMMENTS

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SVOC surrogate recoveries were low on samples "BH2" and "BH5" due to sample emulsification during extraction.

SIGNATORIES

Dave Williams
National Organic Manager

Jeremy Truong
Inorganics Co-ordinator

Pamela Adams
Organic Team Leader

Parameter	Units	LOR	Sample Number	PE052327.001	PE052327.002
			Sample Matrix	Water	Water
			Sample Name	BH2	BH5

Low Level PCBs in Water Method: AN400/AN420

PCB Congener C28	µg/L	0.02	<0.02	<0.02
PCB Congener C52	µg/L	0.01	<0.01	<0.01
PCB Congener C101	µg/L	0.004	<0.004	<0.004
PCB Congener C118	µg/L	0.004	<0.004	<0.004
PCB Congener C138	µg/L	0.004	<0.004	<0.004
PCB Congener C153	µg/L	0.004	<0.004	<0.004
PCB Congener C180	µg/L	0.004	<0.004	<0.004

Surrogates

d14-p-terphenyl (Surrogate)	%	-	26.0	10.0
-----------------------------	---	---	------	------

Low Level OC Pesticides in Water Method: AN400/AN420

Lindane (gamma BHC)	µg/L	0.05	<0.05	<0.05
Aldrin	µg/L	0.01	<0.01	<0.01
p,p'-DDE	µg/L	0.01	<0.01	<0.01
p,p'-DDD	µg/L	0.01	<0.01	<0.01
Methoxychlor	µg/L	0.1	<0.1	<0.1
Hexachlorobenzene	µg/L	0.01	<0.01	<0.01
Alpha BHC	µg/L	0.05	<0.05	<0.05
Beta BHC	µg/L	0.05	<0.05	<0.05
Delta BHC	µg/L	0.05	<0.05	<0.05
Endrin Ketone	µg/L	0.05	<0.05	<0.05
Heptachlor epoxide	µg/L	0.02	<0.02	<0.02

Surrogates

d14-p-terphenyl (Surrogate)	%	-	26.0	10.0
-----------------------------	---	---	------	------

Ultra Low Level OC Pesticides in Water Method: AN400/AN420

Heptachlor	µg/L	0.01	<0.01	<0.01
Gamma Chlordane	µg/L	0.002	<0.002	<0.002
Alpha Chlordane	µg/L	0.002	<0.002	<0.002
Alpha Endosulfan	µg/L	0.005	<0.005	<0.005
Dieldrin	µg/L	0.002	<0.002	<0.002
Endrin	µg/L	0.004	<0.004	<0.004
Beta Endosulfan	µg/L	0.005	<0.005	<0.005
Endosulfan Sulphate	µg/L	0.005	<0.005	<0.005
p,p'-DDT	µg/L	0.002	<0.002	<0.002

Low Level OP Pesticides in Water Method: AN400/AN420

Azinphos-methyl (Guthion)	µg/L	0.05	<0.05	<0.05
Bromophos Ethyl	µg/L	0.05	<0.05	<0.05
Diazinon (Dimpylate)	µg/L	0.01	<0.01	<0.01
Dichlorvos	µg/L	0.5	<0.5	<0.5
Ethion	µg/L	0.05	<0.05	<0.05
Fenitrothion	µg/L	0.2	<0.2	<0.2
Malathion	µg/L	0.05	<0.05	<0.05
Methidathion	µg/L	0.05	<0.05	<0.05

Surrogates

d14-p-terphenyl (Surrogate)	%	-	26.0	10.0
-----------------------------	---	---	------	------



ANALYTICAL REPORT

PE052327 R0

		Sample Number	PE052327.001	PE052327.002
		Sample Matrix	Water	Water
		Sample Name	BH2	BH5
Parameter	Units	LOR		

Ultra Low Level OP Pesticides in Water Method: AN400/AN420

Chlorpyrifos (Chlorpyrifos Ethyl)	µg/L	0.009	<0.009	<0.009
Parathion-ethyl (Parathion)	µg/L	0.004	<0.004	<0.004

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Low Level OC Pesticides in Water Method: ME-(AU)-(ENV)AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Lindane (gamma BHC)	LB006052	µg/L	0.05	<0.05	82%
Aldrin	LB006052	µg/L	0.01	<0.01	112%
p,p'-DDE	LB006052	µg/L	0.01	<0.01	94%
p,p'-DDD	LB006052	µg/L	0.01	<0.01	
Methoxychlor	LB006052	µg/L	0.1	<0.1	
Hexachlorobenzene	LB006052	µg/L	0.01	<0.01	91%
Alpha BHC	LB006052	µg/L	0.05	<0.05	
Beta BHC	LB006052	µg/L	0.05	<0.05	
Delta BHC	LB006052	µg/L	0.05	<0.05	
Endrin Ketone	LB006052	µg/L	0.05	<0.05	
Heptachlor epoxide	LB006052	µg/L	0.02	<0.02	

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
d14-p-terphenyl (Surrogate)	LB006052	%	-	94.0	92%

Low Level OP Pesticides in Water Method: ME-(AU)-(ENV)AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Azinphos-methyl (Guthion)	LB006052	µg/L	0.05	<0.05	
Bromophos Ethyl	LB006052	µg/L	0.05	<0.05	
Diazinon (Dimpylate)	LB006052	µg/L	0.01	<0.01	84%
Dichlorvos	LB006052	µg/L	0.5	<0.5	
Ethion	LB006052	µg/L	0.05	<0.05	
Fenitrothion	LB006052	µg/L	0.2	<0.2	
Malathion	LB006052	µg/L	0.05	<0.05	
Methidathion	LB006052	µg/L	0.05	<0.05	NA

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
d14-p-terphenyl (Surrogate)	LB006052	%	-	94.0	92%

Low Level PCBs in Water Method: ME-(AU)-(ENV)AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
PCB Congener C28	LB006052	µg/L	0.02	<0.02	
PCB Congener C52	LB006052	µg/L	0.01	<0.01	
PCB Congener C101	LB006052	µg/L	0.004	<0.004	
PCB Congener C118	LB006052	µg/L	0.004	<0.004	
PCB Congener C138	LB006052	µg/L	0.004	<0.004	
PCB Congener C153	LB006052	µg/L	0.004	<0.004	
PCB Congener C180	LB006052	µg/L	0.004	<0.004	118%

Surrogates

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
d14-p-terphenyl (Surrogate)	LB006052	%	-	94.0	92%

MB blank results are compared to the Limit of Reporting

LCS and MS spike recoveries are measured as the percentage of analyte recovered from the sample compared the the amount of analyte spiked into the sample.

DUP and MSD relative percent differences are measured against their original counterpart samples according to the formula: *the absolute difference of the two results divided by the average of the two results as a percentage*. Where the DUP RPD is 'NA' , the results are less than the LOR and thus the RPD is not applicable.

Ultra Low Level OC Pesticides in Water Method: ME-(AU)-(ENV)AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Heptachlor	LB006052	µg/L	0.01	<0.01	107%
Gamma Chlordane	LB006052	µg/L	0.002	<0.002	111%
Alpha Chlordane	LB006052	µg/L	0.002	<0.002	
Alpha Endosulfan	LB006052	µg/L	0.005	<0.005	
Dieldrin	LB006052	µg/L	0.002	<0.002	107%
Endrin	LB006052	µg/L	0.004	<0.004	109%
Beta Endosulfan	LB006052	µg/L	0.005	<0.005	
Endosulfan Sulphate	LB006052	µg/L	0.005	<0.005	
p,p'-DDT	LB006052	µg/L	0.002	<0.002	

Ultra Low Level OP Pesticides in Water Method: ME-(AU)-(ENV)AN400/AN420

Parameter	QC Reference	Units	LOR	MB	LCS %Recovery
Chlorpyrifos (Chlorpyrifos Ethyl)	LB006052	µg/L	0.009	<0.009	73%
Parathion-ethyl (Parathion)	LB006052	µg/L	0.004	<0.004	110%

METHOD

METHODOLOGY SUMMARY

AN083	Separatory funnels are used for aqueous samples and extracted by transferring an appropriate volume (mass) of liquid into a separatory funnel and adding 3 serial aliquots of dichloromethane. Samples receive a single extraction at pH 7 to recover base / neutral analytes and two extractions at pH < 2 to recover acidic analytes. QC samples are prepared by spiking organic free water with target analytes and extracting as per samples.
AN400	OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
AN400	OC and OP Pesticides by GC-ECD: The determination of organochlorine (OC) and organophosphorus (OP) pesticides and polychlorinated biphenyls (PCBs) in soils, sludges and groundwater. (Based on USEPA methods 3510, 3550, 8140 and 8080.)
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
AN420	SVOC Compounds: Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).

FOOTNOTES

IS	Insufficient sample for analysis.	QFH	QC result is above the upper tolerance
LNR	Sample listed, but not received.	QFL	QC result is below the lower tolerance
*	This analysis is not covered by the scope of accreditation.	NA	The sample was not analysed for this analyte
^	Performed by outside laboratory.		
LOR	Limit of Reporting		
↑↓	Raised or Lowered Limit of Reporting		

Samples analysed as received.
Solid samples expressed on a dry weight basis.

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here:
<http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf>

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ANALYTICAL REPORT

17 September 2010

Douglas Partners Pty Ltd
96 Hermitage Road
WEST RYDE
NSW 2114

Attention: Lindsay Rockett

Your Reference: 71976-01-Randwick Spec-Stable Precinct Cont Asses

Our Reference: SE81160

Samples: 5 Waters

Received: 6/09/2010

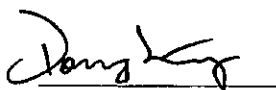
Preliminary Report Sent: 17/09/2010

These samples were analysed in accordance with your written instructions.

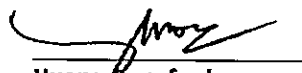
For and on Behalf of:
SGS ENVIRONMENTAL SERVICES

Sample Receipt:	Angela Mamalicos	AU.SampleReceipt.Sydney@sgs.com
Production Manager:	Huong Crawford	Huong.Crawford@sgs.com

Results Approved and/or Authorised by:


Dong Liang
Quality Manager


Ly Kim Ha
Organics Signatory


Huong Crawford
Metals Signatory



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ABN 44 000 964 278

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MBTEX in Water (µg/L) Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-1 BH2 Water	SE81160-2 BH5 Water	SE81160-5 TB1 Water
Date Extracted (MBTEX)		9/09/2010	9/09/2010	9/09/2010
Date Analysed (MBTEX)		9/09/2010	9/09/2010	9/09/2010
Methyl-tert-butyl ether (MtBE)	µg/L	<1	<1	<1
Benzene	µg/L	<0.5	<0.5	<0.5
Toluene	µg/L	<0.5	<0.5	<0.5
Ethylbenzene	µg/L	<0.5	<0.5	<0.5
Total Xylenes	µg/L	<1.5	<1.5	<1.5
Surrogate	%	107	93	101



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BTEX in Water ($\mu\text{g/L}$)		
Our Reference:	UNITS	SE81160-4
Your Reference	-----	TS1
Sample Matrix	-----	Water
Date Extracted (BTEX)		9/09/2010
Date Analysed (BTEX)		9/09/2010
Benzene	$\mu\text{g/L}$	101%
Toluene	$\mu\text{g/L}$	104%
Ethylbenzene	$\mu\text{g/L}$	99%
Total Xylenes	$\mu\text{g/L}$	96%
Surrogate	%	94



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TRH C6-C9 by P/T ONLY-in water Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-5 TB1 Water
Date Extracted (TRH C6-C9 PT)		9/09/2010
Date Analysed (TRH C6-C9 PT)		9/09/2010
TRH Cs - Cs P&T in µg/L	µg/L	<40



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TRH in water with C6-C9 by P/T Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-1 BH2 Water	SE81160-2 BH5 Water
Date Extracted (TRH C6-C9 PT)		9/09/2010	9/09/2010
Date Analysed (TRH C6-C9 PT)		9/09/2010	9/09/2010
TRH C6 - C9 P&T in µg/L	µg/L	<40	<40
Date Extracted (TRH C10-C36)		9/09/2010	9/09/2010
Date Analysed (TRH C10-C36)		9/09/2010	9/09/2010
TRH C10 - C14	µg/L	<100	<100
TRH C15 - C28	µg/L	<200	<200
TRH C29 - C36	µg/L	<200	<200

PAHs in Water Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-1 BH2 Water	SE81160-2 BH5 Water	SE81160-3 BD1/03091 0 Water
Date Extracted		9/09/2010	9/09/2010	9/09/2010
Date Analysed		9/09/2010	9/09/2010	9/09/2010
Naphthalene	µg/L	<0.50	<0.50	<0.50
2-Methylnaphthalene	µg/L	<0.5	<0.5	<0.5
1-Methylnaphthalene	µg/L	<0.5	<0.5	<0.5
Acenaphthylene	µg/L	<0.50	<0.50	<0.50
Acenaphthene	µg/L	<0.50	<0.50	<0.50
Fluorene	µg/L	<0.50	<0.50	<0.50
Phenanthrene	µg/L	<0.50	<0.50	<0.50
Anthracene	µg/L	<0.50	<0.50	<0.50
Fluoranthene	µg/L	<0.50	<0.50	<0.50
Pyrene	µg/L	<0.50	<0.50	<0.50
Benzo[a]anthracene	µg/L	<0.50	<0.50	<0.50
Chrysene	µg/L	<0.50	<0.50	<0.50
Benzo[b,k]fluoranthene	µg/L	<1.0	<1.0	<1.0
Benzo[a]pyrene	µg/L	<0.50	<0.50	<0.50
Indeno[123-cd]pyrene	µg/L	<0.50	<0.50	<0.50
Dibenzo[ah]anthracene	µg/L	<0.50	<0.50	<0.50
Benzo[ghi]perylene	µg/L	<0.50	<0.50	<0.50
Total PAHs	µg/L	<9	<9	<9
Nitrobenzene-d5	%	81	82	83
2-Fluorobiphenyl	%	82	87	88
<i>p</i> -Terphenyl-d14	%	88	101	98



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OCP's Ultra Low LOR-95% ANZECC /ADWG Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-1 BH2 Water	SE81160-2 BH5 Water
OCP's Ultra Low	ug/L	#	#



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Ultra Low Level OP-ANZECC 95% by GCMS Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-1 BH2 Water	SE81160-2 BH5 Water
Ultra Low Level OP	µg/L	#	#



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PCBs in Water	UNITS	SE81160-1	SE81160-2
Our Reference:	-----	BH2	BH5
Your Reference	-----	Water	Water
Sample Matrix			
PCB low level	µg/L	#	#



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Phenols in Water Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-1 BH2 Water	SE81160-2 BH5 Water
Date Extracted (Phenols)		13/09/2010	13/09/2010
Date Analysed (Phenols)		13/09/2010	13/09/2010
Total Phenolics (as Phenol)	mg/L	<0.01	<0.01



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Inorganics Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-1 BH2 Water	SE81160-2 BH5 Water
Date Extracted (pH)		8/09/2010	8/09/2010
Date Analysed (pH)		8/09/2010	8/09/2010
pH	pH Units	6.0	5.8



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Anions in water Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-1 BH2 Water	SE81160-2 BH5 Water
Date Extracted		10/09/2010	10/09/2010
Date Analysed		10/09/2010	10/09/2010
Chloride, Cl	mg/L	35	46
Sulphate, SO ₄	mg/L	95	38



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Trace HM (ICP-MS)-Dissolved Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-1 BH2 Water	SE81160-2 BH5 Water	SE81160-3 BD1/03091 0 Water
Date Extracted (Metals-ICPMS)		8/09/2010	8/09/2010	8/09/2010
Date Analysed (Metals-ICPMS)		8/09/2010	8/09/2010	8/09/2010
Arsenic	µg/L	<1	<1	<1
Cadmium	µg/L	<0.1	<0.1	<0.1
Chromium	µg/L	2	<1	2
Copper	µg/L	12	2	12
Lead	µg/L	<1	<1	<1
Nickel	µg/L	<1	1	<1
Zinc	µg/L	17	15	15



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Mercury Cold Vapor/Hg Analyser	UNITS	SE81160-1	SE81160-2	SE81160-3
Our Reference:	-----	BH2	BH5	BD1/03091
Your Reference	-----			0
Sample Matrix	-----	Water	Water	Water
Date Extracted (Mercury)		8/09/2010	8/09/2010	8/09/2010
Date Analysed (Mercury)		8/09/2010	8/09/2010	8/09/2010
Mercury (Dissolved)	mg/L	<0.0001	<0.0001	<0.0001



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Hardness as CaCO ₃ Our Reference: Your Reference Sample Matrix	UNITS ----- -----	SE81160-1 BH2 Water	SE81160-2 BH5 Water
Date Extracted (Metals)		17/09/2010	17/09/2010
Date Analysed (Metals)		17/09/2010	17/09/2010
Calcium (Dissolved)	mg/L	39	33
Magnesium (Dissolved)	mg/L	5.4	6.2
Hardness as CaCO ₃ (by calc.)	mg/L	120	108



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Method ID	Methodology Summary
SEO-018	BTEX / C6-C9 Hydrocarbons - Soil samples are extracted with methanol, purged and concentrated by a purge and trap apparatus, and then analysed using GC/MS technique. Water samples undergo the same analysis without the extraction step. Based on USEPA 5030B and 8260B.
SEO-020	Total Recoverable Hydrocarbons - determined by solvent extraction with dichloromethane / acetone for soils and dichloromethane for waters, followed by instrumentation analysis using GC/FID. Where applicable Solid Phase Extraction Manifold technique is used for aliphatic / aromatic fractionation.
SEO-030	Polynuclear Aromatic Hydrocarbons - determined by solvent extraction with dichloromethane / acetone for soils and dichloromethane for waters, followed by instrumentation analysis using GC/MS SIM mode.
AN420	Semi-Volatile Organic Compounds (SVOCs) including OC, OP, PCB, Herbicides, PAH, Phthalates, and Speciated Phenols in soils, sediments and waters are determined by GCMS/ECD/FID technique following appropriate solvent extraction process (Based on USEPA 3500C and 8270D).
Ext-003	Analysis subcontracted to SGS Environmental Services Perth, NATA Accreditation No. 2562, Site No. 898.
AN289	Total Phenols - Determined by colourimetric method using Discrete Analyser, following distillation of the sample. Based on APHA 21st Edition 5530B and 5530D.
AN101	pH - Measured using pH meter and electrode based on APHA 21st Edition, 4500-H+. For water analyses the results reported are indicative only as the sample holding time requirement specified in APHA was not met (APHA requires that the pH of the samples are to be measured within 15 minutes after sampling).
SEI-038	Water Soluble Chloride After carrying out a 1:5 soil:water extraction, an aliquot of the extract is reacted with mercuric thiocyanate forming a mercuric chloride complex. In the presence of ferric iron, highly coloured ferric thiocyanate is formed which is proportional to the chloride concentration. Reference NEPM, Schedule B(3), 401 and APHA 4500Cl- Water Soluble Sulphate After carrying out a 1:5 soil:water extraction, sulphate in the extract is precipitated in an acidic medium with barium chloride. The resulting turbidity is measured photometrically at 405nm and compared with standard calibration solutions to determine the sulphate concentration in the sample. Reference NEPM, Schedule B(3), 401 and APHA 4500-SO42-.
AN318	Determination of elements at trace level in waters by ICP-MS technique, in accordance with USEPA 6020A.
SEM-005	Mercury - determined by Cold-Vapour AAS following appropriate sample preparation or digestion process. Based on APHA 21st Edition, 3112B.
SEM-010	Determination of elements by ICP-OES following appropriate sample preparation / digestion process. Based on USEPA 6010C / APHA 21st Edition, 3120B.
AN124	Hardness - determined by a calculation based on the Calcium and Magnesium content of the sample, in accordance with APHA 21st Edition, 2340B.



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Method ID	Methodology Summary

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
MBTEX in Water (µg/L)				
Date Extracted (MBTEX)				09/09/10
Date Analysed (MBTEX)				09/09/10
Methyl-tert-butyl ether (MtBE)	µg/L	1	SEO-018	<1
Benzene	µg/L	0.5	SEO-018	<0.5
Toluene	µg/L	0.5	SEO-018	<0.5
Ethylbenzene	µg/L	0.5	SEO-018	<0.5
Total Xylenes	µg/L	1.5	SEO-018	<1.5
Surrogate	%	0	SEO-018	122

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
BTEX in Water (µg/L)				
Date Extracted (BTEX)				09/09/10
Date Analysed (BTEX)				09/09/10
Benzene	µg/L	0.5	SEO-018	<0.5
Toluene	µg/L	0.5	SEO-018	<0.5
Ethylbenzene	µg/L	0.5	SEO-018	<0.5
Total Xylenes	µg/L	1.5	SEO-018	<1.5
Surrogate	%	0	SEO-018	122

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
TRH C6-C9 by P/T ONLY-in water				
Date Extracted (TRH C6-C9 PT)				09/09/10
Date Analysed (TRH C6-C9 PT)				09/09/10
TRH C6 - C9 P&T in µg/L	µg/L	40	SEO-018	<40



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
TRH in water with C6-C9 by P/T								
Date Extracted (TRH C6-C9 PT)				09/09/10	[NT]	[NT]	[NR]	[NR]
Date Analysed (TRH C6-C9 PT)				09/09/10	[NT]	[NT]	[NR]	[NR]
TRH C6 - C9 P&T in µg/L	µg/L	40	SEO-018	<40	[NT]	[NT]	[NR]	[NR]
Date Extracted (TRH C10-C36)				09/09/10	[NT]	[NT]	SE81160-1	09/09/10
Date Analysed (TRH C10-C36)				09/09/10	[NT]	[NT]	SE81160-1	09/09/10
TRH C10 - C14	µg/L	100	SEO-020	<100	[NT]	[NT]	SE81160-1	102%
TRH C15 - C28	µg/L	200	SEO-020	<200	[NT]	[NT]	SE81160-1	107%
TRH C29 - C36	µg/L	200	SEO-020	<200	[NT]	[NT]	SE81160-1	102%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
PAHs in Water								
Date Extracted				09/09/10	[NT]	[NT]	SE81160-2	09/09/10
Date Analysed				09/09/10	[NT]	[NT]	SE81160-2	09/09/10
Naphthalene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	SE81160-2	83%
2-Methylnaphthalene	µg/L	0.5	SEO-030	<0.5	[NT]	[NT]	[NR]	[NR]
1-Methylnaphthalene	µg/L	0.5	SEO-030	<0.5	[NT]	[NT]	[NR]	[NR]
Acenaphthylene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	SE81160-2	81%
Acenaphthene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	SE81160-2	94%
Fluorene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Phenanthrene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	SE81160-2	94%
Anthracene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	SE81160-2	94%
Fluoranthene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	SE81160-2	94%
Pyrene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	SE81160-2	105%
Benzo[a]anthracene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Chrysene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Benzo[b,k]fluoranthene	µg/L	1	SEO-030	<1.0	[NT]	[NT]	[NR]	[NR]
Benzo[a]pyrene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	SE81160-2	73%
Indeno[123-cd]pyrene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Dibenzo[ah]anthracene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]
Benzo[ghi]perylene	µg/L	0.5	SEO-030	<0.50	[NT]	[NT]	[NR]	[NR]



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
PAHs in Water						Base + Duplicate + %RPD		Duplicate + %RPD
Total PAHs	µg/L	9	SEO-030	<9	[NT]	[NT]	[NR]	[NR]
Nitrobenzene-d5	%	0	SEO-030	97	[NT]	[NT]	SE81160-2	90%
2-Fluorobiphenyl	%	0	SEO-030	87	[NT]	[NT]	SE81160-2	95%
p -Terphenyl-d 14	%	0	SEO-030	87	[NT]	[NT]	SE81160-2	107%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
OCP's Ultra Low LOR-95% ANZECC /ADWG				
OCP's Ultra Low	ug/L		AN420	<0.01

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
Ultra Low Level OP-ANZECC 95% by GCMS				
Ultra Low Level OP	µg/L		AN420	<0.5

QUALITY CONTROL	UNITS	LOR	METHOD	Blank
PCBs in Water				
PCB low level	µg/L		Ext-003	<0.1

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
Phenols in Water						Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (Phenols)				13/09/2010	[NT]	[NT]	LCS	13/09/2010
Date Analysed (Phenols)				13/09/2010	[NT]	[NT]	LCS	13/09/2010
Total Phenolics (as Phenol)	mg/L	0.01	AN289	<0.01	[NT]	[NT]	LCS	90%



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD
Inorganics						
Date Extracted (pH)				[NT]	SE81160-1	8/09/2010 8/09/2010
Date Analysed (pH)				[NT]	SE81160-1	8/09/2010 8/09/2010
pH	pH Units	0	AN101	[NT]	SE81160-1	6.0 6.0 RPD: 0

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Anions in water								
Date Extracted				10/09/10	SE81160-1	10/09/2010 10/09/2010	SE81160-2	10/09/10
Date Analysed				10/09/10	SE81160-1	10/09/2010 10/09/2010	SE81160-2	10/09/10
Chloride, Cl	mg/L	0.05	SEI-038	<0.05	SE81160-1	35 35 RPD: 0	SE81160-2	98%
Sulphate, SO4	mg/L	0.1	SEI-038	<0.1	SE81160-1	95 95 RPD: 0	SE81160-2	100%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Trace HM (ICP-MS)-Dissolved								
Date Extracted (Metals-ICPMS)				08/09/10	[NT]	[NT]	LCS	8/09/2010
Date Analysed (Metals-ICPMS)				08/09/10	[NT]	[NT]	LCS	8/09/2010
Arsenic	µg/L	1	AN318	<1	[NT]	[NT]	LCS	101%
Cadmium	µg/L	0.1	AN318	<0.1	[NT]	[NT]	LCS	94%
Chromium	µg/L	1	AN318	<1	[NT]	[NT]	LCS	102%
Copper	µg/L	1	AN318	<1	[NT]	[NT]	LCS	99%
Lead	µg/L	1	AN318	<1	[NT]	[NT]	LCS	96%
Nickel	µg/L	1	AN318	<1	[NT]	[NT]	LCS	102%
Zinc	µg/L	1	AN318	<1	[NT]	[NT]	LCS	97%



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QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Mercury Cold Vapor/Hg Analyser								
Date Extracted (Mercury)				8/09/2010	[NT]	[NT]	LCS	8/09/2010
Date Analysed (Mercury)				8/09/2010	[NT]	[NT]	LCS	8/09/2010
Mercury (Dissolved)	mg/L	0.0001	SEM-005	<0.0001	[NT]	[NT]	LCS	101%

QUALITY CONTROL	UNITS	LOR	METHOD	Blank	Duplicate Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
Hardness as CaCO3								
Date Extracted (Metals)				17/09/2010	[NT]	[NT]		08/09/10
Date Analysed (Metals)				17/09/2010	[NT]	[NT]		08/09/10
Calcium (Dissolved)	mg/L	0.1	SEM-010	<0.1	[NT]	[NT]		109%
Magnesium (Dissolved)	mg/L	0.1	SEM-010	<0.1	[NT]	[NT]		110%
Hardness as CaCO3 (by calc.)	mg/L	1	AN124	[NT]	[NT]	[NT]	[NR]	[NR]

QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate Base + Duplicate + %RPD	Spike Sm#	Matrix Spike % Recovery Duplicate + %RPD
MBTEX in Water (µg/L)					
Date Extracted (MBTEX)		[NT]	[NT]	SE81160-2	09/09/10
Date Analysed (MBTEX)		[NT]	[NT]	SE81160-2	09/09/10
Methyl-tert-butyl ether (MTBE)	µg/L	[NT]	[NT]	SE81160-2	121%
Benzene	µg/L	[NT]	[NT]	SE81160-2	123%
Toluene	µg/L	[NT]	[NT]	SE81160-2	127%
Ethylbenzene	µg/L	[NT]	[NT]	SE81160-2	124%
Total Xylenes	µg/L	[NT]	[NT]	SE81160-2	125%
Surrogate	%	[NT]	[NT]	SE81160-2	92%



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QUALITY CONTROL	UNITS	Dup. Sm#	Duplicate	Spike Sm#	Matrix Spike % Recovery
TRH in water with C6-C9 by P/T			Base + Duplicate + %RPD		Duplicate + %RPD
Date Extracted (TRH C6-C9 PT)		[NT]	[NT]	SE81160-2	09/09/10
Date Analysed (TRH C6-C9 PT)		[NT]	[NT]	SE81160-2	09/09/10
TRH C6 - C9 P&T in µg/L	µg/L	[NT]	[NT]	SE81160-2	117%
Date Extracted (TRH C10-C36)		[NT]	[NT]	[NR]	[NR]
Date Analysed (TRH C10-C36)		[NT]	[NT]	[NR]	[NR]
TRH C10 - C14	µg/L	[NT]	[NT]	[NR]	[NR]
TRH C15 - C28	µg/L	[NT]	[NT]	[NR]	[NR]
TRH C29 - C36	µg/L	[NT]	[NT]	[NR]	[NR]



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Result Codes

[INS] : Insufficient Sample for this test
[NR] : Not Requested
[NT] : Not tested
[LOR] : Limit of reporting

[RPD] : Relative Percentage Difference
* : Not part of NATA Accreditation
[N/A] : Not Applicable

Report Comments

Low level OC/OP/PCB analysed by SGS-Perth, report No. PE052327 R0, report attached.

Samples analysed as received. Solid samples expressed on a dry weight basis.

Date Organics extraction commenced:

NATA Corporate Accreditation No. 2562, Site No 4354

Note: Test results are not corrected for recovery (excluding Air-toxics and Dioxins/Furans*)

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Quality Control Protocol

Method Blank: An analyte free matrix to which all reagents are added in the same volume or proportions as used in sample processing. The method blank should be carried through the complete sample preparation and analytical procedure. A method blank is prepared every 20 samples.

Duplicate: A separate portion of a sample being analysed that is treated the same as the other samples in the batch. One duplicate is processed at least every 10 samples.

Surrogate Spike: An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are added to samples before extraction to monitor extraction efficiency and percent recovery in each sample.

Internal Standard: Added to all samples requiring analysis for organics (where relevant) or metals by ICP after the extraction/digestion process; the compounds/elements serve to give a standard of retention time and/or response, which is invariant from run-to-run with the instruments.

Laboratory Control Sample: A known matrix spiked with compound(s) representative of the target analytes. It is used to document laboratory performance. When the results of the matrix spike analysis indicates a potential problem due to the sample matrix itself, the LCS results are used to verify that the laboratory can perform the analysis in a clean matrix.

Matrix Spike: An aliquot of sample spiked with a known concentration of target analyte(s). The spiking occurs prior to sample preparation and analysis. A matrix spike is used to document the bias of a method in a given sample matrix.

Quality Acceptance Criteria

The QC criteria are subject to internal review according to the SGS QAQC plan and may be provided on request or alternatively can be found here: <http://www.au.sgs.com/sgs-mp-au-env-qu-022-qa-qc-plan-en-09.pdf>



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Appendix F

Quality Assurance and Quality Control

QA/QC PROCEDURES AND RESULTS

Q1. FIELD QUALITY ASSURANCE AND QUALITY CONTROL

The field QC procedures for sampling as prescribed in Douglas Partners *Field Procedures Manual* were followed at all times during the assessment.

Q1.1 Sampling Team

Field sampling was undertaken by DP Environmental Scientist Nizam Ahamed. Soil samples were collected on 20, 23 August and 3 September 2010. Sampling was undertaken during fine or overcast weather conditions.

Q1.2 Sample Collection

Sample collection procedures and dispatch are reported in Section 8.

Q1.3 Logs

Logs for each sampling location were recorded in the field. The individual samples were recorded on the field logs along with the sample identity, location, depth, initials of sampler, duplicate locations, duplicate type, site observations. Analysis to be performed on each sample and the dispatch courier were recorded on the COC, Appendix E. Logs are presented in Appendix D.

Q1.4 Chain of Custody

Chain of custody information was recorded on the Chain of Custody (COC) sheets and accompanied samples to the analytical laboratory. Signed copies of COCs are presented in Appendix D, following the laboratory reports.

Q1.5 Sample Splitting Techniques

Replicate and triplicate samples were collected in the field as a measure of accuracy, precision and repeatability of the results. Field replicate samples for soil were collected from the same location and an identical depth to the primary sample. Equal portions of the primary sample were placed into the sampling jars and sealed. The sample was not homogenised in a bowl and then split to prevent the loss of volatiles from the soil. Replicate samples were labelled with a DP identification number, recorded on DP bore logs, so as to conceal their relationship to their primary sample from the analysing laboratory.

Q1.6 Duplicate Frequency

Field sampling comprised replicate and triplicate sampling, at a rate of approximately one duplicate sample for every ten original samples for intra-laboratory and inter-laboratory analysis.

Q1.7 Field Blank Results

A field blank is a sample taken as an indication to demonstrate correct field handling. A rinsate sample was not required within the scope of the current assessment. This is further discussed in Section Q1.9.

Q1.8 Background Sample

A background sample is representative of natural background soil conditions. Background samples were collected from the natural soils as part of this assessment to assess the chemical characteristics local natural soils.

Q1.9 Rinsate Samples

Soil samples were collected from auger cuttings and test pit returns by hand while wearing disposable gloves which were changed between samples. Therefore no rinsate sample was required. It also noted that the results of the soil and groundwater samples do not show any evidence of cross contamination.

Q1.10 Trip Spikes

According to *the NSW EPA Guidelines for Consultants Reporting on Contaminated Sites (1997)*, laboratory prepared trip spikes are to be taken into the field, subjected to the same preservation methods as the field samples, then analysed, for the purposes of determining the losses in volatile organics incurred prior to reaching the laboratory.

The practicalities of trip spikes are currently being debated and a detailed procedure is yet to be finalised. Discussions with the laboratory indicated that trip spikes are generally prepared as aqueous solutions. The laboratory prepared an aqueous trip spike and two soil trip spikes which were preserved in the standard manner and taken into the field unopened. The volatile organic recovery rates are shown below. At this stage, the laboratory has no standard acceptance limits in recovery rates as results from in-house laboratory controls often vary. Results (Table D1) indicate that the percentage loss for BTEX during the trip was minimal and therefore appropriate preservation techniques were employed.

Table D1: Trip Spike Results

Sample ID	Matrix	Recovery (%)			
		Benzene	Toluene	Ethyl Benzene	Total xylene
Trip Spike 200810	soil	60%	66%	84%	64%
Trip Spike 230810	soil	90%	83%	84%	86%
Trip Spike 030910	water	101%	104%	99%	96%

Q1.11 Trip Blanks

Laboratory prepared soil and water trip blanks were taken out to the field unopened, subjected to the same preservation methods as the field samples, then analysed for the purposes of determining the transfer of contaminants into the blank sample incurred prior to reaching the laboratory. The result of the laboratory analysis for the trip blanks is shown in Tables D2.

Table D2: Trip Blank Results – TPH/BTEX mg/kg

Sample ID	matrix	Benzene	Toluene	Ethyl Benzene	Total xylene
Trip Blank 200810	soil	<0.5	<0.5	<1	<3
Trip Blank 230810	soil	<0.5	<0.5	<1	<3
Trip Blank 030910	water	<0.5	<0.5	<0.5	<1.5

Levels of analytes were all below detection limits for soil and groundwater indicating that cross contamination had not occurred during the course of the round trip from the site to the laboratory.

Q1.12 Field Instrument Calibration

All soil samples were screened for the presence of Total Photo-Ionisable Compounds (TOPIC) using a calibrated Photo-Ionisation Detector (PID). The PID was calibrated at Enviroequip and in the field with Isobutylene gas.

Q1.13 Relative Percentage Difference

A measure of the consistency of results for field samples is derived by the calculation of relative percentage differences (RPDs) for duplicate samples. A RPD of +/- 30% is generally considered typically acceptable for inorganic analytes by EPA, although in general a wider RPD range (50%) may be acceptable for organic analytes.

